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9. ABSTRACT

A basic problem with planned agricultural development in LDCs is that central planners specify what must be done to achieve targets without specifying how, by whom, and when. A great gap exists between government officials and tradition-bound farmers. The objective of this reference work is to help bridge the gap by providing information for improving the capabilities of planners on the regional and local levels. It concentrates on materials that can improve decision-making in the management of agricultural plans and programs. The materials are derived from an analytic review of more than 1,700 reports and articles describing how agricultural projects were successfully implemented. Sections of the book deal with the following topics: the link between agricultural and overall planning; types of agricultural planning; preparing an agricultural plan; objectives for agricultural development; the stocktaking and diagnostic survey; setting targets and allocating resources; selecting agricultural development strategies; policy and policy instruments; financing agricultural plans; design and evaluation of projects; organization for planned development; extension and research; education and training; consultancy services; and monitoring, reporting, and control.

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MANAGING PLANNED AGRICULTURAL DEVELOPMENT

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GOVERNMENTAL AFFAIRS INSTITUTE
Agricultural Sector Implementation Project
1776 Massachusetts Avenue, N.W.
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FOREWORD

This draft of Managing Planned Agricultural Development is the last in a series. However, those of us who have worked on this draft are reconciled to the realization that a work like the present one must always remain a draft which represents only what we have been able to learn about the management of planned agricultural development up to the moment when the draft is released. Inevitably, this draft is incomplete, not only because we did not find it possible to examine every printed source (although well over 1,700 articles, books, reports and other documents have been studied); but also because much information about the management of planned agricultural development has never been put into written form, and we have not been able to speak with everyone who could have told us about their experiences (although we have spoken with many practitioners in the field and incorporated their relevant experience in this draft).

While the research approach we adopted to compile this draft was inductive and comparative in the sense that we sought to synthesize successful agricultural and rural development lessons by comparing theory and practice, its main thrust was to extract from theory and practice elements which could be applied by agricultural managers in less developed countries to improve the management of planned agricultural and rural development. Whenever it appeared to be desirable, we have described, evaluated and analyzed theory and practice which have failed; but we have tried to concentrate on what has been proved to be successful; and even when failures have been included, we have tried to show what might have been done, or what could be done, by agricultural managers to improve the inadequate results obtained. In the main, we have chosen to concentrate on "successes" (although what is a success is difficult to define with exactitude but easy to identify in relative if not in absolute terms) rather than on "failures" because we believe that while one can learn what not to do from failures (which makes their inclusion in this draft defensible), one learns best about how to manage planned agricultural and rural development by studying successes. We agree with René Dubos that "it is useful to watch for success stories because more can be learned from what works than from what fails. There are a hundred ways of doing a thing wrong, but only a few ways of doing it right."1/ A task we set for ourselves, therefore, was to study especially "the very few ways of doing it right" and to describe these ways in terms which would permit agricultural planners to put them into practice.

1/ From "Human Life Can Prosper with Spartan Ways," by René Dubos. The New York Times, January 6, 1975, p. 27.

The result, as can be seen by thumbing through the draft, is a reference work rather than a document to be read sequentially from cover to cover. While we hope the draft proves to be useful as a reference work, our intention (as explained in the Introduction which follows) was to use the draft as a basis for preparing work exercises for training courses for agricultural managers. This we have done, with the results reported in another document. 1/

Since the materials from which the draft was prepared were drawn from all parts of the world, the conclusions arrived at are unlikely to apply without adaptation to any one country, or within a country, to any one region or subregion. Moreover, general conclusions such as are included in the draft will surely include some which will not apply--even with adaptation--to every country. Since we subscribe to the tenent that the situation in a country or region should be the main determinant of the methods adopted to manage planned agricultural and rural development, it follows that each country or region must ultimately prepare its own reference work for managing planned agricultural and regional development within its confines. For this reason we have tried to include in the draft alternative techniques and approaches to management of agricultural and rural development from which a country or region could select those which appear to be most relevant to its needs. While we do not believe we have so completely covered each subject that no other sources will need to be tapped, we hope that the draft will prove to be a useful source for a reference work prepared for a specific country or region.

While the draft is conceived primarily as a basis for the preparation of materials for use in training agricultural managers, we hope it may be useful to a wide audience, including nationals of developing countries and foreign advisers in these countries who are concerned with agricultural and rural development, as well as teachers and students of agricultural and rural development. Readers of this work may consider some sections particularly relevant for nationals of developing countries and others particularly relevant for foreign advisers. However, we have envisaged our main audience to be agricultural managers in developing countries. Among "agricultural managers," are found government officials, including national, regional and local planners; agricultural extension and service personnel at all levels; rural cooperative officials; other individuals concerned with marketing, credit and other activities related to agriculture; as well as agro-businessmen and others in the private sector engaged in storage, marketing and other activities associated with agriculture. While we have included materials in

1/ A Review of the Pilot Training Course of the Agricultural Sector Implementation Project (ASIP), Conducted July 21-August 29, 1975. Prepared by the Staff of the ASIP, February 26, 1976. Governmental Affairs Institute, 1776 Massachusetts Avenue, N.W., Washington, D.C. 20036.

the draft which we hope will be useful to agricultural managers at all levels, at the center of government and the private sector, as well as in the field, we conceive our primary audience to be agricultural managers at the middle level.

Where we believed that most agricultural managers at the middle level had no need to know the details of certain techniques, we either referred those readers who wished to obtain more details than we included in the text to other publications or, where it appeared desirable to have some technical material at hand, to an annex to the text in order not to interfere with the discussion in the main body of the draft. In choosing to follow a middle road between discussion which was either too general or too technical, we were motivated by a desire, on the one hand, to avoid repeating technical procedures which are easily obtainable in published works and, on the other hand, to avoid so generalized a discussion that it is inadequate as a guide to action for agricultural managers. It is up to the reader to judge the extent to which we have succeeded or failed in achieving the right balance.

Many persons participated in the preparation of research materials for, or the writing of earlier drafts of, this reference work. We want to thank the following ASIP former and present staff members and consultants for their contributions in the areas indicated: Roger Adams (regional planning); Patricia Jeffers Devlin (training); Carolyn Dick (research); Khadija Haq (finance); Steven Hoglund (editing and production of final text); Rusty Lawrence (projects); Kathie Major (training, research and editing and production of final text); Bob Nothstein (research); Gene M. Owens (organization and progress reporting); Ellen Schaengold (research); and Morris Solomon (projects). For their perseverance in typing numerous earlier drafts as well as the present text, and for their administrative support of the project, we thank Kathleen Furgerson, Barbara Mehmel, Barbara Mills, Judith Neal, and Patsy Segal.

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MANAGING PLANNED AGRICULTURAL DEVELOPMENT

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MANAGING PLANNED AGRICULTURAL DEVELOPMENT

I. INTRODUCTION

A. Impediments to Managing Agricultural Development

At one end of the planning scale in most less-developed countries, planners at the center of government produce plans for agricultural and rural betterment; at the other end, farmers follow their own "plans" with little reference to, or awareness of, the plans produced at the center. The prime objective of this work is to help bridge the gap between planners and farmers by providing information for improving the capabilities of those in the developing countries concerned with the planned development of the agricultural sector.[1/] A variety of factors account for the yawning gap between the plans of central planners and farmers. Since the formulation of sound plans for agricultural development requires capabilities which are in short supply in poor countries, the gap between plan and performance in these countries is often attributable to ill-devised plans. It is easy to name countries in Latin America, Africa and Asia with plans which are inconsistent, unrealistic or otherwise difficult or impossible to implement. Even when plans are relatively sound,

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1/ Agricultural development is herein conceived as an essentially intra-sectoral activity which includes all services necessary to its promotion. In contrast, rural development is conceived as a multi-sectoral activity which includes, besides agriculture, infrastructure (schools, clinics, roads, communications, power, etc.) and welfare services (control of disease, programs for improved nutrition, higher adult literacy, family planning, etc.). While the primary objective of agricultural development is increased growth in agricultural output and supplies, the primary objective of rural development is the enrichment of material and social welfare. But agricultural development is the backbone of rural development since it provides the increased income required for self-supporting rural development. While it is true that attempts to achieve agricultural development outside the framework of a program for rural betterment often fail to benefit a majority of producers, it need not be so. This, and the problems inherent in a multi-sectoral approach, make it desirable to limit the scope of this work mainly to agricultural development. However, since it is desirable to ensure the widest possible distribution of benefits from agricultural development, attempts will be made, wherever feasible, to deal with agricultural improvement in terms of its impact on rural welfare. This is especially important for regional, subregional and local development, where a multi-sectoral approach is often the preferred approach.

however, results may be poor because central planners merely incorporate in their plans what must be done to achieve aggregate input and output targets, without indicating with sufficient precision how, by whom and when it is to be done. Critics have often cited India's plans as being in this category, but the same criticism applies to the agricultural plans of most other countries.

Often, what needs to be done is not done because of inadequate systems of communication between planners and technical ministries, departments and agencies; 1/ between entities of a national government, on the one hand, and regional and local government agencies on the other; or between those in the private sector who are engaged in production, storage, marketing and other activities related to agriculture and those in the public sector who are supposed to provide the supporting services. There is a widespread paucity of good informational systems for disseminating needed technical, economic and other information to farmers. Between tradition-bound farmers and government officials a great gap often exists. The failure of communication is so common that it is difficult to name a low-income country where communication among government entities or between them and the private sector is good.

Yet another reason for discrepancies between plan and performance is the lack of suitable administrative procedures and institutional organization at all levels of government for managing agricultural development. This accounts for the fact that in many developing countries, expenditures from budgetary and loan resources lag badly behind what is available for agricultural projects. Perhaps most important, the dearth of skilled managers and other personnel at all levels, but especially at regional, subregional and local levels, seriously impedes the transfer of knowledge to producers, thereby curtailing agricultural and rural development even when a government has a strong desire to develop the agricultural and the rural sectors. In Tanzania, for example, the Government has felt it necessary to denude the Central Government of its civil servants in order to staff regional governments with trained personnel to further ujamaa, its program for rural development.

B. Basic Materials for Dealing with Management Problems

As a consequence of the development efforts undertaken in developing countries, considerable experience has been accumulated about what works and what does not. There is a sizable

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1/ One reason for this is that planners tend to see a problem as an aggregate while operational people tend to see it as a project, or as one experienced observer has put it: "Planners see a problem as a forest while project people see only a tree."

but scattered body of theoretical and applied knowledge obtained from research and experience which provides information for improving management of planned development in the agricultural sector. At the same time, without systematized information about which approach has proved successful and which unsuccessful, and why one has been more or less successful than another, managers of agricultural development in less developed countries frequently have to make decisions based on partial information, hunch or whim.

The task which this work has tried to accomplish, therefore, is the collection of available information required to lay a sound basis for improving the planning and management of agricultural development. It proved most convenient to do this by comparing theoretical or normative works with the practice in countries which have tried to plan all or part of their agricultural development in a systematic way. The lessons learned from the comparative analysis are incorporated herein.

Good management of the agricultural sector requires realistic plans. This means that in formulating a plan, planners must be alert to the problems of implementation and indicate precisely how the plan is to be carried out after carefully weighing the feasibility of the means they propose for this purpose. Planners must also take account of the main problems agricultural managers are likely to encounter when they attempt to organize staff, control or otherwise administer the execution of the plan on a day-to-day basis. Since management must convert into action the means of implementation required to carry out a plan formulated to achieve specified objectives, formulation, implementation and management of development plans constitute interrelated aspects of the same process. This reference work is therefore concerned with the formulation, provision for implementation, and management of agricultural development plans, although it concentrates on improving decision-making for implementing and managing agricultural plans, programs and projects.

It is hoped that this work, by itself, will be a useful reference text for those concerned with planning and managing agricultural development in poor countries. However, it is envisaged as only a first step in improving the capacities of agricultural managers and in helping bridge the gulf between planners and producers. If this work is to be more than an addition to the literature on agricultural and rural development, an effective way must be found for translating the information in it into forms which are useful to agricultural managers working at different levels.1/

1/ As used herein, the term "agricultural managers" includes individuals in key positions who are concerned with agriculture, but excluding farmers. Agricultural managers

The kind of information that agricultural managers need about management of the agricultural and rural sectors varies with the level at which they operate. For example, at the national level, agricultural managers generally require a broad overview of the problems of both management and techniques for improving planned development of the agricultural sector (e.g., the major objectives, targets, strategies and policies for development of the agricultural sector and the problems they raise). At the regional level, agricultural managers may have to have more detailed information than at the national level to operate effectively (e.g., they may have to know how to go about linking provincial with national markets and local with provincial markets), although they may not require as broad a spectrum of information as agricultural managers at the national level; while at the local level, agricultural managers may require very detailed information (e.g., about exactly how to manage a project), although the information required would generally be narrower in scope than at the national and regional levels.

It would have been impractical to prepare a handbook or manual which all agricultural managers, regardless of educational background and training, could use as a guide. Moreover, such a handbook or manual by itself cannot be a sufficient basis for transferring information to the many individuals in the public and private sectors at national regional and local levels who would qualify as agricultural managers. To meet these varying needs, a course was designed and tested in Washington, D.C. in July-August 1975 to train agricultural managers in poor countries in methods of planning, implementing and managing the development of the agricultural and rural sectors. The substantive core of the Course came from the materials in this reference work. The materials were tailored to the needs of the mostly middle-level, but also some upper-level, agricultural managers from six countries who participated in the Course. A Review of the Course has been completed which describes the lessons learned from the Course. One lesson was that the materials in this reference work lend themselves to arrangements which permit their use to train agricultural managers with varying backgrounds, skills and experience at national and regional levels in countries of varying size and situations at different levels of development. This reference work has been prepared <u>primarily</u> as a source book for such training courses.

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comprise government officials, including national, regional and local planners; agricultural extension and other agricultural service personnel at all levels; rural cooperative officials and other individuals concerned with marketing, credit and other activities related to agriculture; as well as key agrobusinessmen and others in the private sector engaged in storage, marketing and other activities associated with agriculture.

II. THE LINK BETWEEN AGRICULTURAL AND OVERALL PLANNING

A. Planning within an Overall Framework

Although it is hard to find a national development plan with an articulated program for agriculture which has been well-integrated with other sector programs or with the macroeconomic framework in the plan, overall development plans virtually always include an agricultural program. In addition, many countries have prepared programs for agriculture without reference to a national development plan. Such programs can be found in the country formerly called Ceylon,[1/] Chile, Israel (1 p. 63) and other countries, particularly in Latin America. (2, p. 115 and 3, p. 63) Most agricultural planning specialists frown on agricultural programs prepared outside the framework of an overall plan.[2/] They take the position, as one proponent of this point of view put it, that "Programming for agricultural development must be undertaken within the framework of development planning for the whole economy." (18, pp. 66, 67. Cf., also 19, p. 548)

The arguments for this point of view are forceful. Thus, it has been pointed out that development in agriculture and in other sectors is interdependent and mutually supporting. Moreover, it seems clear that if some kind of balance in intersectoral growth is to be maintained; if consistency and efficiency in allocating scarce resources among sectors are to be achieved; and if agricultural goals are to conform to national goals, agricultural plans must be undertaken as an integral part of comprehensive national planning. (14, pp. 546-9; 12, p. 31; 9, p. 56)

These arguments have been sufficiently compelling for most low-income countries to embody their agricultural programs in national development plans. But, unhappily, since national plans are frequently ignored to a greater or lesser extent by budgetary authorities and technical ministries, departments and autonomous agencies, it frequently happens that the plans are not carried out. Moreover, whatever the reasons, whenever countries fail to meet plan targets, they almost always have the greatest shortfalls in agriculture. This has happened in

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1/ 1, p. 65. Ceylon's program was for five years and included irrigation and land development.

2/ See, for example, 4, p. 109; 5, p. 33; 6, p. 5; 7, p. 29; 8, p. 3; 9, p. 56; 10, p. 1; 11, p. 178; 12, p. 31; 13, p. 21; 14, pp. 548-9; 15, p. 1; 16, p. 26; 17, p. 4.

India, Pakistan, Spain, in the U.S.S.R., as well as in many other countries. In the poor countries, one may say that the failure to attain agricultural targets largely explains the failure of poor countries to grow in accordance with their overall plan targets. (70, pp. 297-8) One study has found "that in the developing countries, where the annual rate of increase in agricultural output has been slow, the average rate of overall growth has also been slow, and vice versa." (19, p. 21)

Obviously, one solution is to improve the overall planning process. But the problems have thus far proved to be too difficult for most poor countries to solve. As matters stand, therefore, the results achieved from overall planning have proved to be so disappointing that some authorities contend that there is a "crisis in planning." A group of planning specialists and administrators convened in Sussex, England, some years ago for a conference with that very title.1/ While most of those present agreed that there was a crisis in planning, others felt that the problem was rather one of how to plan in crisis; by which they meant that increased political instability and economic uncertainty, (which make it difficult to obtain a national consensus), combined with official and administrative inability to maintain the required discipline (a characteristic of underdevelopment), was making it impossible for many low-income countries to carry out their medium-term, comprehensive plans.

It is unnecessary for our purposes to resolve this issue; but it is impossible to ignore the effect on agricultural planning. In Latin America, disillusionment with overall planning explains why many countries in the region no longer prepare national plans. In other regions, most countries have national plans, but many of these have little chance of being implemented.

Where there are no overall plans or where those which exist are not being implemented effectively, the question arises whether it is possible, and if so, whether it is desirable, to prepare sector plans for agriculture outside an overall framework. Some authorities contend that even when no overall framework exists, agricultural plans must be based, implicitly if not explicitly, on assumptions regarding the progress of the overall economy, with parameters for the expected growth of population, national product and income, consumption, foreign trade, industry and so on. (20, p. 6)

1/ Conference on "The Crisis in Planning" sponsored by the Institute of Development Studies at the University of Sussex, Brighton, England, in June-July, 1969.

This approach was taken by the Food and Agriculture Organization of the United Nations (FAO) in the agricultural plan it prepared for Nigeria for 1965-1980. In formulating that plan and in the absence of a Nigerian perspective plan for the country's economy, the FAO produced its own perspective growth model of the Nigerian economy for 1965-1980, for the sole purpose of fitting the agricultural plan into an aggregative framework.1/ (21, p. xxv). At the time the FAO report was published in 1966, this approach appeared to provide some assurance that the size and composition of the agricultural plan was based on reasonable assumptions about the progress of the Nigerian economy. But aside from the fact that the methodology of forecasting economic change for periods as long as 15 years is still underdeveloped, political instability and economic uncertainty often make short shrift of economic forecasts, as events in Nigeria demonstrated.2/

B. Planning without an Overall Framework

It is incontestable that optimal allocations of resources to economic sectors and to projects within each sector can only be made within the framework of a plan for the whole economy. But the record shows that many practitioners involved in agricultural planning appear to be willing to forego optimality, since they prepare agricultural plans outside an aggregative framework where existing national plans are not operational or where it is considered unfeasible to prepare overall plans which have a reasonable chance of being implemented.3/

Moreover, experience demonstrates that it is possible in practice, however undesirable in theory, to achieve considerable successes when planning is confined to the agricultural sector. (23, p. 115) What seems to have been more important

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1/ The model took as its starting point the broad objectives of national economic and social policy enunciated in Nigeria's National Development Plan for 1962-1968. (21, p. v)

2/ As Wordsworth put it: "High heaven rejects the lore
Of nicely calculated less or more."

3/ For example, one writer, describing the situation in the Malagasy Republic, said: "In view of the importance of the agricultural sector, on the one hand, and the difficulty of working out an overall plan, on the other, one may well conceive the idea of confining oneself to an agricultural plan of an operative character, that is to say, one which is envisaged as a coherent whole consisting of operations at different levels. This approach can only be retained for lack of better, but we must at the same time admit that it can often be more effective than that of drawing up a brilliant overall plan which, however, is not capable of being translated in terms of specific operations." (22, p.2)

than an overal. plan in Taiwan, Israel and Mexico, for example, was the strength of the effort exerted to develop the agricultural or rural sector in these countries. It seems reasonable to suppose that this would also be the decisive factor in most developing countries, given the fact that agriculture in these countries contributes the major part of the national output and income and employs most of the population. Even the World Bank, sometimes in cooperation with the Food and Agriculture Organization of the United Nations, has been preparing agricultural plans outside an overall planning framework in several countries, including Colombia, (24) Greece, (25) Peru, (26) Spain, (27) Ethiopia and the Democratic Republic of the Congo.

All of which is not to say that it is more desirable to plan for agriculture outside a macroeconomic plan for all sectors of an economy. But it is worth noting that when agricultural development is part of an overall plan, it is often subordinated to industrial or infrastructural development. This could be one reason why those in developing countries who wish to advance agricultural development sometimes consider it desirable to plan for agriculture outside a macroenonomic plan. They may believe that it is more likely that agriculture will receive the resources and attention they consider desirable in a sector plan than in a macroeconomic plan, where it is all too easy to shift resources from agriculture to other sectors. To the extent that agriculture receives an appropriate share of resources in an overall plan, overall planning is superior to partial planning for agricultural development. But to the extent to which central planners are biased against agriculture or in favor of other sectors, those who wish to see the agricultural sector advance may opt for agricultural development outside a macroeconomic framework.

III. ASPECTS OF AGRICULTURAL PLANNING

A. Deficiencies of Agricultural Plans

Whether or not they were incorporated in national development plans, most countries have some kind of agricultural plan. But because there is no widely-accepted set of principles for sector planning agricultural development, the plans have varied greatly from country to country. If one thinks that a plan for agriculture should start with one or more achievable objectives; indicate the resources available to attain them; explain how the resources are to be distributed among projects; and state the strategies, policies and institutional arrangements by which resources are to be used to achieve the objectives, one will find few agricultural plans which meet these criteria. (28, p. 1141)

Many plans do not have clearly-defined objectives, unless it is to carry out a bundle of projects which constitute the main component of these plans.1/ Sometimes, attempts are made to coordinate the projects, but often they are largely unrelated to each other. Productive projects are included in almost every agricultural plan, but it is more common for a large number of piddling projects to be included in plans which individually or collectively are unlikely to add much to output or income when completed; still other plans emphasize overly-ambitious, large-scale projects for irrigation, settlement and the like. (2, p. 115) Productive or not, trivial or grandiose, few projects have been carefully prepared and their cost effectiveness estimated. This was true of the 43 projects which comprised Bolivia's agricultural plan for 1962-1971 in the abortive Ten-Year Economic and Social Development Plan, and it is true for the projects included in many other agricultural plans.

When objectives have been stated, it often happens that the means for attaining them have not been included because they have not been devised. Some plans merely recount the intentions of a government, without stating the strategies and policies to be adopted; some do not indicate what resources are

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1/ See, for example, the First Five-Year Plan of the Republic of Somali, which concentrated "on a handful of projects." (29, p. 17)

to be allocated to each project in the program;1/ others set only input targets, but not output. (18, pp. 67-88) Plans which claim to be comprehensive often exclude a large part of investments by the private sector. Some plans which aspire to including all public investments for agriculture, may actually concentrate on only one or two public investment sub-sectors. Thus, Iran's agricultural plan in the Second Development Plan for 1955/56 to 1961/62 was more a plan for public investment in irrigation than an agricultural plan. (30, p. 58)

There are agricultural plans that attempt the impossible by detailing a long list of projects which cannot possibly be completed within the plan period. This is defensible if the planners recognize that there will be no returns from some projects during the period of the plan. But when no distinction is made between such projects and those which are expected to yield output and income during the program period, it is apparent that the planners do not have a clear notion of the limitations of the program's time horizon. The agricultural plan in Iran's Third Five-Year Plan for September 1962-March 1968 illustrates this point. Despite the five-year period of the Plan, the agricultural plan included survey and research, range improvement and educational plans, as well as a project for planting olive trees which would require up to 30 years to carry out! (30, p. 58)

B. Time Horizons of Agricultural Plans

Since the agricultural plans of most countries are incorporated in their medium-term national development plans, most of which range from three to seven years, with a mode of five, the periods of the plans are generally too short for bringing about basic changes in agriculture. It is possible within a medium-term period to plan production of annual crops and crops from existing trees, carry out some projects for improving agricultural practices, start and carry forward long-term projects, and establish or reorganize institutional arrangements for bettering agriculture. But land reclamation and settlement projects, manpower training and education projects for agriculture, improvement of nutrition as well as large-scale irrigation projects, take many years, and forestation projects may take decades, to build up to a point where they begin to yield appreciable returns. The planting of such tree crops as citrus fruits, coffee, coconuts and rubber, and the development of beef cattle breeds are also well-known examples of agricultural projects with long gestation periods. (4, p. 122) For example, it took about 45 years to develop the Jamaica Hope

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1/ This may be because there are not enough well-prepared projects. If resources are allocated to a sector only in the aggregate, there is no telling whether the amount will be sufficient to carry out the projects required to implement the plan. It is only when projects have been prepared in some detail and their location determined that it becomes possible to estimate their cost with reasonable accuracy.

breed of cattle to a point where distribution of the cattle to Jamaican farmers could begin.

It is essential, therefore, in planning for agriculture to take a longer than medium-term look into the future. How long a look depends on the agricultural changes sought. The development or improvement of plantation products like citrus products, tea, rubber, coconut and coffee requires a look ahead of at least 10 years; (20, p. 11) for irrigation and soil conservation 15 year, 20 year or even longer periods may be necessary; for growing mahogany trees, 50 years may not be too much! But the agricultural planners of most countries look into the future for only 10 or 15 years.

Yet, even a 10 or 15 year period is too long for the formulation of plans of action for agricultural development. Aside from the shortage of basic data required for long-term planning, so many unforeseeable changes in domestic and external conditions are likely to occur in most low-income countries that a detailed plan for 10 or 15 years is almost sure to be out-of-date before long. That is why planners recommend that long-term or "perspective" plans for 15 years or more lay out only broad lines of desirable agricultural development. The perspective plan need not be couched in precise terms but should formulate the strategy of development in the agricultural sector in terms of the country's needs and technical possibilities in particular fields, e.g., forestry, land development, irrigation, agricultural education, and so on. (20, p. 6)

With such a perspective, it becomes possible to define the general direction in which long-run development should take place for a country, in accordance with the government's objectives. This strategy can then be supplemented with projects and policies for achieving development objectives for agriculture consistent with national development goals. But the projects and policies need not, indeed should not, be incorporated in the perspective plan for agriculture since the time horizon of such a plan is so long that the perspective plan will undoubtedly have to be revised, perhaps several times, in the light of events. For this reason, it is generally recommended that the agricultural development be spelled out in medium-term agricultural plans, leaving details of the projects which extend beyond the medium-term period for inclusion in future medium-term plans. While each project needs to be studied and prepared in detail, the timing and scale of its incorporation into a medium-term agricultural plan depends ultimately on unforeseeable factors which may require its acceleration, retardation or even elimination.

What matters is that the perspective and medium-term plans be reviewed periodically and adjusted to take account of changes brought about by domestic and external events. The review of the

perspective plan can be made every few years. But for the medium-term plans, it is usually an annual exercise, and may be done in one of several ways.

One way of adjusting to change is to revise the entire medium-term plan for agriculture every year for the remainder of the plan period. This is a difficult and time-consuming exercise because it requires an amount of talent which few low-income countries possess. A second way to revise outdated medium-term plans is to prepare annual plans which take account of progress made to date, allocate available resources to projects as a basis for budgetary appropriations, and set out specific instruments of policy and other measures for achieving development objectives. While this is an easier way of adjusting to unforeseen changes, it has a serious defect. As the years pass, the annual plans tend to deviate so substantially from the medium-term plan that it no longer provides much guidance for the preparation of annual plans.

A third way of taking appropriate account of change is through the introduction of a so-called "rolling plan." In this procedure, an additional year (or two) is added to the medium-term plan at the end of each year (or two) after making adjustments required as a consequence of changed circumstances in the year just passed. In this way, the medium-term plan provides a look ahead at each year's end for an undiminished period. This approach has the additional advantage of providing a medium-term plan with up-to-date benchmarks for annual plans, which have to be prepared anyway to make the medium-term plan operational. If the "rolling forward" technique is applied every few years to the perspective plan, the latter can also be updated to provide guidelines for rolling the medium-term program forward each year.

The employment of perspective, medium-term and annual plans is an ideal solution to the time-horizon problem. The perspective plan permits a look far enough ahead to identify in broad outline the main directions of agricultural development. The medium-term plan spells out in greater detail than does the perspective plan the interim goals which must be achieved in the medium-term to attain the longer-run targets. And the annual plans make the medium-term plans operational by (a) reducing medium-term targets (which are usually stated in terms of the end of the medium-term plan period) to annual targets so as to allow allocations required for their achievement to be incorporated in annual budgets and (b) enumerating in sufficient detail the measures which will be adopted to achieve the plan's objectives. The three plans fit together like a nest of tables, with the medium-term program under the perspective program and the annual program under the medium-term program.

This approach to agricultural planning is largely associated with conventional macroeconomic planning which, most authorities agree, requires the preparation of overall perspective, medium-term and annual development plans. The difficulty with it is that few low-income countries have ever succeeded, in practice, in formulating the three types of development plans and in integrating annual plans, where they exist, with annual budgets. Although some countries have, or have had, perspective development plans and almost all have, or have had, medium-term plans, very few have made these plans operational with annual plans closely linked with government budgets.

In practice, agricultural planning in low-income countries has been largely limited to the preparation of only one multiannual plan, the duration of which has varied. For example, Taiwan has had a four-year and a ten-year agricultural plan; Afghanistan, Iran and Israel have used five-year agricultural plans;1/ Portugal had a nine-year agricultural plan which started in 1962; Ceylon, Egypt, and the U.S.S.R. have preferred ten-year agricultural plans;2/ the Peoples Republic of China had a Twelve Years' Plan for agriculture covering the years 1956-67 (later changed to 1959-68); Bulgaria had a fourteen-year plan for agriculture for 1957-1970; Yugoslavia has a fifteen year plan; Ceylon has a twenty-year program for forestry and El Salvador has a twenty-year plan for agriculture. Plans of shorter duration, usually for a year, are frequently employed in addition to the multiannual plan to translate the longer-term agricultural plans into plans of action. This combination has proved to be workable.

On the basis of this experience, therefore, it would seem acceptable to prepare only one multiannual plan and an annual operational plan. While the multiannual plan could be for a period of only five years in countries which have few projects with long gestation periods, most countries are likely to find plans for 10 to 20 years more suited to their needs. Where time and talent exist, a rolling plan for the first three years of the multiannual plan, more detailed than the rest of the plan, but less detailed than the annual plan, could be given third priority because it permits adjustment to be made in the

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1/ Israel finds the five-year period long enough for most agricultural subsectors since the effect of decisions made will be felt within the five-year term. However, this is not true for citrus fruit, which is planned over a ten-year period. (31, p. 3) Afghanistan's and Iran's agricultural plans are part of national development plans, while that of Israel is not.

2/ However, Ceylon's tea replanting plan is for 15 years.

multiannual plan required by changed circumstances. As a fourth priority, the multiannual plan as a whole might be rolled forward every four or five years.

C. Scope of Agricultural Plans

The scope of agricultural plans reveals as much variation as their duration. Many countries prepare what they term comprehensive sector plans for agriculture. But comprehensiveness does not mean that each agricultural subsector receives equal attention. For example, in Israel's agricultural plan, the subsector plan for forestry and, even more, the subsector plans for fishing and hunting, are less detailed than the plans for agricultural crops and animal husbandry; similarly, the agricultural program in Ethiopia's Plan for 1962/63 - 1966/67 gave much less attention to fishing and hunting than to crop production and livestock. Nor does comprehensiveness imply that private investment receives the same emphasis as public investment. Often it does not. In contrast to the attempts at comprehensiveness of many agricultural plans -- bearing in mind that comprehensiveness is frequently accompanied by variations in emphasis -- some agricultural plans concentrate on only one subsector or even on one crop. (4, p. 145)

It is desirable, when possible, to plan for the entire agricultural sector. Where the data required is reasonably good; the available trained manpower, financial and other resources adequate; and time is not a critical factor, comprehensive coverage of the sector is better than partial coverage. But since there are few countries in this enviable position, there is much to be said for partial planning, not because it is as good in theory as comprehensive planning, but because it sometimes works better in practice. For example, in a country where one or two subsectors account for most of the agricultural output, as, for example, is true in Uruguay where animal husbandry is the major agricultural subsector, it is quite acceptable to limit the scope of a plan to these subsectors. There are examples of successful plans where available resources for agricultural development were largely devoted to a particular crop. In this way, for example, the output of jute was expanded rapidly in India after partition and, later, the production of sugar cane was increased, Rubber and cocoa in other countries provide additional examples. (4, p. 145)

But partial planning of agriculture is not always the best course. Thus, where a major government aim is to diversify agriculture which is too heavily dependent upon one crop, or where the objective is to strike a better balance among the various agricultural subsectors, it may be best to plan comprehensively. Even so, it is well to be selective in emphasizing one subsector over another.

1. Classification Systems

For this purpose, as well as for other reasons, a suitable definition of the agricultural sector, which prescribes its limits and classifies or divides it into appropriate components, is essential. There are four ways in which the agricultural sector generally has been defined. The first is in terms of the people involved, i.e., the agricultural labor force; the second is in terms of establishments, i.e., farms or agricultural holdings; the third is in terms of economic activity, i.e., the different processes undertaken within the sector; and the fourth is in terms of output, i.e., the commodities produced. Each definition poses problems.

a. By the Agricultural Labor Force

Thus, while there is no doubt that those who are engaged full-time in agriculture (whether as farmers who work their own or others' land, or as landless laborers) are part of the agricultural labor force, questions arise about persons who work only occasionally in agriculture, either as part-time farmers or as temporary laborers. Whether the wives of farmers or their children who contribute to agricultural output should be regarded as part of the agricultural labor force is part of this question. (32, pp. 51-52)

Whether or not all these people are included can make a difference for planning purposes. If, for example, per capita estimates of agricultural incomes are calculated by dividing the value added by agricultural production by an agricultural labor force which includes as equals all persons who make any contribution toward agricultural production, the result is likely to be substantially smaller than if a more restrictive definition of the agricultural labor force is used. A more valid estimate of the per capita income will be obtained if the agricultural labor force includes full-time adult workers engaged in agriculture, plus part-time and child workers expressed in terms of their equivalence to full-time adult workers. (32, p. 53) But this requires data and expertise in making use of available data which are not always available.

b. By Agricultural Establishments

A farm or agricultural holding is also difficult to define precisely. A farm or an agricultural holding is generally defined as an establishment wholly or partly devoted to the production of agricultural commodities. However, when classifying the agricultural sector by farms or holdings (which is the way it is done in an agricultural census), some way must be found to distinguish farms and holdings from family gardens. This is usually done by defining a farm or holding as an area used for agriculture which is either at least an arbitrarily determined mimimum

size (a minimum which excludes family gardens) or if smaller than the minimum size, one which yields an output exceeding a certain minimum amount or value (this also excludes family gardens but permits inclusion of small holdings like vineyards, hot houses producing high-value flowers, mushroom beds, etc.).

c. By Economic Activity

The third way of defining the agricultural sector, by economic activity, raises a problem about how to classify establishments which are engaged in a variety of agricultural pursuits. The two criteria established by the U.N. International Standard Industrial Classification to deal with this problem provide that (1) the farming units included in a given activity group must account for the bulk of the output of these units and (2) the group must contain most of the farming units which produce most of the class of goods and services which characterize the activity concerned. Since classifications of the agricultural sector by economic activity group all units engaged in the same agricultural activity irrespective of whether they are part of incorporated enterprises, or owned by individual proprietors or governments, problems may also arise if information about the ownership or operation of agricultural establishments is required for planning purposes.

The best-known example of a classification system which groups farming (and other) establishments according to the kind of economic activity they are engaged in is the United Nations International Standard Industrial Classification of All Economic Activities (ISIC), which includes the agricultural sector. The ISIC arranges economic activities into four subdivisions: (1) Major Divisions, (2) Divisions, (3) Major Groups and (4) Groups. There are ten Major Divisions in the ISIC, of which Major Division 1 covers Agriculture, Hunting, Forestry and Fishing. Under Major Division 1 are 3 Divisions divided into 6 Major Groups, as follows:

Major Division 1. Agriculture, Hunting, Forestry and Fishing

Division	Major Group	Title of Category
11		Agriculture and Hunting
	111	Agriculture and livestock production
	112	Agricultural services
	113	Hunting, trapping and game propagation
12		Forestry and Logging
	121	Forestry
	122	Logging
13	130	Fishing

The six Major Groups are divided into seven Groups, including considerable detail, as shown in Annex A. (33, pp. 26-7)

d. By Commodity

The fourth way of defining the agricultural sector, based on agricultural commodities, is the most common. It raises a variety of problems, some of which are discussed below. A typical example of a commodity classification system divides the agricultural sector into five subsectors: (1) agricultural crops, (2) animals and their products, (3) forests and products, (4) game and (5) fish.

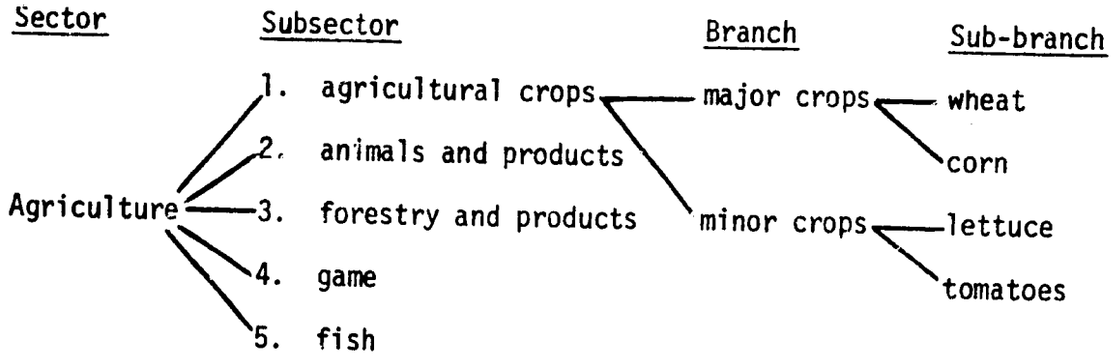
These subsectors may, in turn, be subdivided into branches and sub-branches. Thus, the agricultural crops subsector may be divided into branches of major and minor crops and each crop may then be listed as a sub-branch. This is by no means the only possibility. As is indicated in Figure 1, the agricultural crops subsector may also be divided into two branches: (1) food and beverage commodities, and (2) industrial raw materials; alternatively, a distinction may be made between export and domestic commodities on the basis of where they are consumed: between crops which are produced by farmers for their own subsistence and crops produced for domestice sale; between crops produced on publicly-owned lands as opposed to those produced on privately-owned farms; between crops produced on indigenous farms and those produced on foreign-owned plantations, and so on. (34, pp. 21-2) The branches may then be divided further into sub-branches, e.g., the export crop branch may be divided into traditional and non-traditional export sub-branches or any of the branches may be divided into sub-branches composed of individual crops like cotton, jute and so on.

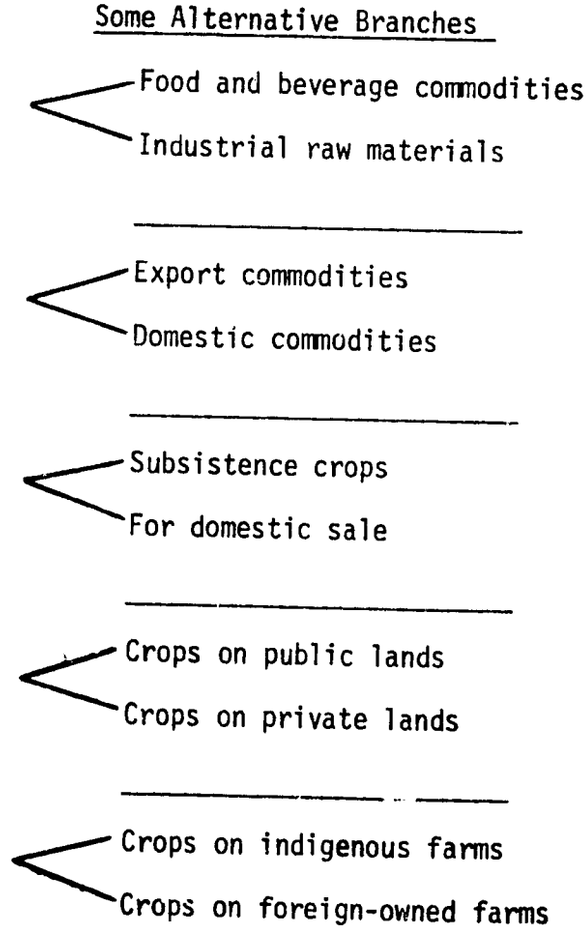
The division of subsectors into branches can run into problems when the dividing line between two branches is obscure. Thus, oil-producing plants fall into the food and beverage as well as the industrial raw material branches. Although precision is not alway possible, it may nonetheless be useful to make such distinctions for planning purposes.. (35, p. 5)

Another problem relating to the coverage of agricultural plans concerns secondary and tertiary products or activities stemming from agriculture. Since marketing, processing and even manufacturing activities are often closely linked to, if not inseparable from primary activities or commodities produced in the agricultural sector, questions of inclusion or exclusion arise. For example, the development of poultry-raising and animal husbandry depends on the supply of feed. This means that poultry-raising and animal husbandry are inherently connected with feed production and processing. Because fish spoil quickly, cold

FIGURE 1

Hypothetical Commodity Subdivisions of the Agricultural Sector





storage, smoking, drying, canning, filleting and other secondary activities or their products are closely tied to fishing or its products. Where the agricultural plan is part of an overall plan, classification problems of this kind can usually be resolved by clarifying the often blurred line between the agricultural and industrial sectors. In these situations it is only necessary to insure that all secondary and tertiary activities and products associated with agriculture are included in one of the two sectors. But where the agricultural plan is prepared outside an overall framework and there is no industrial plan, it may be desirable to include these activities or products in the agricultural plan. (35, pp. 5-6)

The importance of agriculture in the economies of most low-income countries also invites the inclusion of other activities or products in the plan for developing the sector. For example, the difficulty of absorbing surplus farm labor in these countries, has led some specialists to recommend that family planning for rural areas be included in agricultural plans. (36, p. 149) Once again, the answer to the question of whether any activity or product related to agriculture should be included in an agricultural plan depends on the plan's objectives and the available alternatives.

Clearly, an agricultural plan cannot include every related activity or product; however, if the activity or product is so closely connected with agriculture that separate handling is indesirable, or, if there is no other sector plan to which it can be conveniently assigned, its inclusion in the agricultural plan may be justified. Thus, Israel's comprehensive plan for agriculture for 1962/63-1966/67 includes water development, despite the fact that it relates only partly to agriculture; while Afghanistan (in its Plan for 1967/68-1971/72), Spain (in its Plan for 1964-67) and Taiwan (in its 1961-64 Plan) included irrigation in the agricultural plans of their national plans. It is clear, therefore, that the classification of the agricultural sector of one country is not necessarily the same as that of another.

The appropriate division of a country's agricultural sector must be determined by the structure of its agriculture, the stage of development and the sectoral development objectives. Each country must therefore tailor its classification system to its own situation. Thus, in a country where the balance of payments' impact of an agricultural plan is important, the way the agricultural sector is subdivided should make it possible to distinguish between export and domestic agricultural acitvities or commodities.

2. <u>When to Use Which Classification System</u>

If agricultural development objectives are mostly oriented toward increasing output or exports of specific products, and international comparisons are not important, a commodity classification system may suffice. However, if agricultural development objectives are, or are likely to become, concerned with income distribution

or levels of living of specified groups of farmers, a classification system based on economic activity is appropriate because it permits farms to be classified according to their size, character, technology and organization of production (besides facilitating international comparisons), and thus to separate, let us say, peasant from commercial, small from large, or poorly-endowed from well-endowed, farms. A classification system based on commodities does not allow such distinctions to be made since it is only concerned with the output of different commodities without reference to its origin. Consequently, planning for the improvement of specific kinds of farms, e.g., peasant, small or poorly-endowed farms, is made difficult by the use of a classification system based on commodities. Since many developing countries use classification systems based on commodities, this introduces problems in a field which already has a goodly number.

The ISIC not only permits farms of different kinds, technology and organization to be identified; it also permits the classification of data by the commodities produced (see the Groups listed in Annex A under Major Groups and Divisions). Thus, a classification system based on economic activity, like the ISIC, can meet planning requirements when development objectives emphasize either betterment of specified groups of farms, increased output or both. If there is interest in rural development, better levels of living for poor farmers and reduction in income inequalities, consideration should be given to establishing classification systems based on economic activity in countries without them.

Classification systems based on the location, size and kinds of holding and the size and character of the agricultural labor force are useful for planning purposes whatever the development objectives; but they are indispensable for effective planning of the betterment of the levels of living of poor farmers. Developing countries therefore need to give thought to extending the use of these classification systems.

However, in setting up an agricultural classification system, much depends on a country's statistics. Where the statistical data are stated in a certain way or are wanting in one or more respects, the agricultural classification may have to conform to the available date. Ideally, of course statistics should conform to the needs of agricultural planning rather than the other way around. But this is impossible to achieve in the short run. (34, p. 22) Consequently, planners must often make do with what is available, at least at the beginning of the planning process.

However, since planning involves the use and comparison of different statistical series, it is essential to ascertain if the various series cover the same field of observation and are therefore comparable. If the data in different series are not comparable, the conclusions drawn from them can be invalid. (32, p. 53)

D. Territory Covered by Agricultural Plans

1. The Need for Regional Planning

An agricultural plan for a country as a whole cannot be realistic unless it takes adequate account of the varying ecological requirements in the different areas in the country. Temperature, rainfall, humidity, soil, water resources, drainage, topography and altitude, all condition the methods used to increase agricultural crop and livestock production. Some regions are potentially more productive than others; some (perhaps because they are close to seaports with easy access to foreign markets or to urban and industrial centers with a high effective demand for perishable foodstuffs), have had a head start and lead; while others (perhaps located in more remote, inland parts of a country) lag in the development of their agricultural resources. Regions with irrigation facilities are able to take advantage of new varieties of rice, wheat, and corn, whereas those dependent on rainfall may not. Moreover, if disparities among regions are to be reduced, the needs of depressed regions will increase. Each region is, therefore, likely to have its own requirements for progress.

Even within a region there may be considerable diversity. Thus, the planners concerned with the Daudzai Project in Pakistan, which covered an area of about 80 square miles with 89 villages and a 1972 population of about 96,000 persons, learned that "the needs of one village very often differ from those of another, and unless and until an intensive survey...is undertaken, a meaningful development plan for an area cannot be prepared." (37, p. 8)

Ideally, therefore, a national agricultural plan should include regional plans for all the regions in a country, each of which takes adequate account of the requirements of the different parts of the region with which it is concerned. But it is a difficult task for a national agricultural plan to include plans for every region, particularly if it has pretentions toward comprehensive coverage of the agricultural sector. This helps explain why national agricultural plans have usually been couched in broad terms, with few details about the problems and needs of specific areas in a country. (38, p. 229) Even when the problems of different areas of a country have been taken into account in setting national targets, ways and means of obtaining decisions at the farm level which are essential for achieving targets have seldom been spelled out in adequate detail.

2. Regionalization of the Planning Process

In recent years, however, countries with and without national development plans have been turning increasingly to regional planning for agriculture. Partly, this has been the result of a political evolution which manifests itself, among other ways, in increasing

political awareness of formerly docile or quiescent groups long shackled by self-doubt. With increasing political awareness has come the realization that governments play important roles in the development of regions when they allocate public investment funds and adopt policies and programs which stimulate or restrict investment. Regional leaders are increasingly seeking to influence investment decisions of national governments and obtain more favorable resource allocations for their constituents. Partly, also, increased interest in regional planning has been a result of the experience with national and sector planning, both of which were already well-endowed with infrastructure and other substantial investment projects, thereby increasing rather than decreasing regional disparities.1/

A canvass of experience thus far reveals that regional planning has taken three major forms. The first is a national plan for agriculture composed of subplans for all regions in a country, coordinated in accordance with national development objectives and strategies. This form may be carried out either by aggregating regional agricultural plans into a national plan, or by dis-aggregating national to regional agricultural sector plans. (39, p. 8)

The U.S.S.R. is an example of a country which aggregates regional agricultural plans into a plan for the nation. Under reforms instituted in recent years, the central planning authority sets quotas for agricultural products to be delivered by each region. Within the regions local agricultural planning units prepare their own plans which are reviewed and modified, if necessary, with their regional organizations. These are then transmitted to the planning authorities in their respective republics, from whence they are passed on to the central planning authority. (40, p. 503)

In the mixed-economy countries, Israel has been more systematic and successful than most others in incorporating regional plans for the entire country into a national agricultural plan. (1, p. 68) The regional plans are incorporated in the national plan after the preparation of a preliminary plan for the country's agriculture as a whole. With this preliminary plan as the basic framework, regional planners consult each settlement and draw up plans for them which are coordinated and included in the final draft of the national agricultural plan. (41, p. 226)

Some European countries have begun to set regional targets within what are still essentially agricultural plans for their countries as a whole. France is perhaps the most prominent example. Starting with its Fourth Plan, targets for public and private investment and for levels of employment were set for the agricultural

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1/ When this happened in Indonesia during the period of the first five-year plan (Repelita I), the second five-year plan (Repelita II) provided new emphasis on regional planning.

sector, among others, in each of the 21 regions of the country.

The second kind of regional plan for agriculture covers one or several selected regions within a country. The argument in favor of this approach is that less developed countries do not have the financial and manpower resources, nor are they likely to have them in the near future, to carry out a comprehensive program for developing their agriculture over an entire country. The sheer task is so much beyond their capacity that the concentration of resources in one or a few regions is likely to yield higher returns than is possible if the same resources were spread more thinly over an entire country. (4, p. 145)1/ India's Third Five-Year Plan provides an example of this approach. This Plan contained an Intensive Agricultural Development Program under which one district in each state was selected for a concentrated approach of agricultural development. In each district selected, a "minimum package" which included all the elements required to increase output was provided, including irrigation, fertilizer, pesticides, improved seeds, strengthened extension services, and improved credit and marketing facilities. (4, pp. 145-146)2/

The third kind of regional agricultural plan is a part of a plan for a specific region covering other sectors besides agriculture. This kind of plan is sometimes adopted when an important region of a country is lagging behind others, as in Brazil's Northeast and the South of Italy; or when it is considered desirable to develop natural resources located in a region, e.g., a river basin for irrigation or other purposes, as in the case of Aswan in Egypt.

1/ "Would it not be better," asks one advocate of this approach in India, "to concentrate development efforts on selected areas rather than scatter limited resources over half a million villages?...is it really desirable that for all time to come India should continue to have 500,000 villages which may never be viable social or economic units?" (42, p. 75) The author who cited the above quotation contended that selective regional planning required by the then existing program which emphasized water, fertilizer and education in each village would never succeed unless and until the structure of the countryside was changed from village economy to a "landscape of functional agro-urban communities." (42, p. 74)

2/ A variant of this second kind of regional planning involves special attention to a particular crop, e.g., high yielding varieties of wheat and rice. Since a specific crop is often largely grown in a few regions, often because they possess the water supply, good farmers or other resources which have a high production potential, the practical effect of this approach is to concentrate resources in these regions. This may be thought of as unpremeditated regional planning which may help the regions concerned but also exacerbate problems of regional and individual income disparities.

3. The Methodology of Regional Planning1/

a. The Growth Pole or Growth Center Regional Development Model

While there is a considerable literature on regional development, there is no widely accepted theory which identifies the key elements in regional development and the means by which development can be initiated and maintained. Nevertheless, there are three propositions which most regional planners probably would agree are helpful in planning regional development. These are that regional development (1) largely depends on the extent to which a region's export capabilities expand; (2) requires the mobilization of government and individuals to take advantage of development opportunities as they arise; and (3) is most effective within the framework of an integrated regional or subregional plan.

The argument in favor of developing the export base assumes that a region has a comparative advantage in one or more agricultural or manufactured products, or in both manufactured or agricultural products, which can be expanded by the establishment of specialized marketing organizations, improved credit and transport facilities, a trained labor force, and complementary industries. The need to mobilize government and individuals assumes that ability to recognize, evaluate and act on investment opportunities, as well as willingness to accept risk and adopt innovations, is frequently lacking in underdeveloped regions. And the notion that economic development must take place within an integrated regional or subregional system derives from the belief that only thereby can planners obtain a proper understanding of where development arises and how it is diffused through the regional or subregional economy.

The model which is most widely accepted among regional planners may be stated in two propositions: (1) Growth and development are initiated in a limited number of urban "growth centers" or "growth poles"; and (2) is then diffused from these urban centers to their respective hinterlands by growth-inducing innovations and market mechanisms.2/ By implying that agricultural development within a region depends on prior development of an urban center within a region, the model necessarily requires the concentration of resources on urban development, at least in the early stages of

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1/ This section borrows freely from James C. Miller's review monograph, Regional Development, A Review of the State of the Art, Office of Urban Development, Bureau for Technical Assistance, Agency for International Development, U.S. Department of State, August 1974. In the absence of a different citation, the material is drawn from the Miller monograph.

2/ The major work in dynamic growth pole theory has been done by the French economist, Francois Perroux. His theories describe and explain the process by which growth poles are born, grow, develop and sometimes disappear.

regional development. Because of the importance of this requirement for agricultural development, it is well to examine the tenets of the model and to assess the results which have been attained from its application in developing countries.

Proponents of the growth center or growth pole model hold that growth and development occur when some firms or industries in an urban area exert such a dominant effect on their environment that they determine the direction and rate of development of other firms or industries. Some dominant industries in an urban area may also be "leading industries." These are new industries with a high level of technology, a rapidly increasing demand for their products and a strong capacity to generate, adopt and transmit innovations. When dominant industries expand and produce a cluster in their sphere of influence, they form an "industrial complex." A development pole or center exists when the core of the industrial complex is composed of dominant industries which are also leading industries.

Growth becomes self-sustaining when firms or industries with strong forward and backward linkages1/ attract other firms into the development center. The ensuing agglomeration of firms produces economies external to firms in the center, but internal to the center itself which are appropriated by firms in the center, thereby reducing their costs of operation.2/

Growth centers may be viewed in terms of their (1) distribution activities or (2) production activities. The first view attributes the centers' importance for regional development to their capacity to link urban and rural economies by providing collection and distribution points for goods. As collection points, centers are places to which rural produce, primarily agricultural, is brought to be sold, processed or consumed. Centers are of different sizes, and collection points at the lowest level are small. Goods in these small centers are partially processed and then shipped to larger and more industrialized centers for further processing and ultimate consumption. Growth centers may thus be seen as the location of marketing, storing and processing facilities. As

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1/ For example, a firm consuming intermediate goods would have a backward linkage to firms producing intermediate goods, and a forward linkage to firms consuming its own products.

2/ Among the most important of these economies are reduced transport costs. A growth center not only makes possible reduced shipping costs among firms located in the center, but tends to reduce shipping costs to and from the center. This is because the volume of traffic generated by a center provides opportunities for economies in terminal facilities, bulk shipping rates and frequent service. A center also provides opportunities for the establishment of improved labor markets, financial institutions, and utilities and other services which help keep costs down. It also provides a market for consumer and producer goods.

distribution points, centers are the sites where rural populations obtain the goods and services required to raise standards of living and levels of productivity. These include goods processed and manufactured in larger centers (e.g., durable goods); improved agricultural inputs distributed from larger centers (e.g., better seeds, tools and fertilizer); and health, education, agricultural extension, credit and government services.

The second view of growth centers revolves around the number of production-oriented activities which locate in them. The number of such activities which locate in a center is determined by the minimum conditions or "thresholds" which must be met if an economic activity is to function efficiently. The thresholds involved include the size of the market (regional, national or international); economies of scale in production; infrastructure requirements; inter-industry linkages; and labor requirements. Thus, firms serving large markets, enjoying increasing returns to scale and requiring skilled manpower, will concentrate in centers with well-developed transport services and large manpower reserves. Firms with strong linkages to these firms will locate in the same area. In contrast, firms operating at lower thresholds can locate at smaller centers which meet their minimum input and marketing needs.

Economic development typically reaches its greatest levels in a few growth centers and is then diffused hierarchically through the regional or subregional economy, nationally along production-oriented centers and regionally through distribution-oriented centers. Thereafter, development is diffused from the urban areas of a region to the hinterlands in a wave-like process, with the benefits of urban-industrial development transmitted through the improved functioning of product and factor markets in the urban centers. Empirical studies are held to confirm that, except in agricultural areas oriented toward national and international rather than regional markets, there is a direct positive relationship between rural income and the size of local urbanization. This is held to occur because urban industrial growth leads to increased demand for agricultural commodities, greater capital formation and adoption of innovations in nearby agriculture, more intensive cultivation, improved infrastructure and absorption of excess rural labor.

In summary, those who hold to the growth center or growth pole model contend that theoretical and empirical findings reveal, first, that regional growth and development take place most effectively through the articulated development of a system of urban centers, hierarchically arranged from small agro-urban towns upward through severla intermediate types to the metropolis. Growth impoulses are transmitted from the metropolis to the rural areas, with the larger centers retaining activities of greater scale and capital intensity, and smaller centers acquiring activities that can be performed at lesser scale for more local markets, or in which the capital-labor ratio is low, and with all centers diffusing growth to their hinterlands. Second, the city is the "engine"

of regional development and is the link between the regional and national economy. Agriculture tends to be more efficient, commercial and prosperous in the vicinity of cities, and progressively less so as the distance from urban centers increases until, in the more inaccessible peripheries of regions, it is characterized by backward, subsistence agricultural systems. Third, a regional hierarchy of growth centers whose accessibility to farmers is assured by existing means of transport is essential for the efficient distribution of goods and services required for rural development.

b. Examples of the Growth Pole and Growth Center Approach

Most countries which have made an attempt at regional development have relied on growth center strategy. Regional planners in these countries have tried through various means to create external economies and linkages at selected urban locations. The usual approach to regional development has been through a government-sponsored industrial development plan. Frequently, the plan is directed toward strengthening existing towns and cities that are considered to be strategically located or on the threshold to sustained growth. However, in some cases, new towns are constructed, especially in areas lacking cities and towns of any significant size. After identifying the locations to be developed as growth centers, a government usually devises a public investment plan and economic incentives for the private sector designed to guide industrial investment toward these centers. The plan may include provision for direct public investments in industry, industrial estates, other infrastructure and social programs, as well as low interest loans, grants, tax abatements and subsidies to private investors.

Italy has had one of the longest experiences with growth center planning. Between 1950-57, the Cassa per il Mezzogiorno, the organization established by the Italian government to raise the economic level of the poor southern part of the country, proceeded on the assumption that agriculture was the key to reducing the economic gap between the poor South and the richer North. When it became apparent that industry would not be self-generating from an improved agricultural base in the South, a three-pronged program was substituted for the agricultural strategy in 1957.

The first element of the program was a set of compensatory measures designed to off-set the higher operating costs of firms locating in the South as compared to the North. These included exemptions from some taxes and duties, grants to small-and-medium-sized firms, low interest loans, provision of risk capital, reduced transport fees and technical assistance. The second element was a series of investments in state-controlled regional firms, largely in the heavy industry sector. The third element was a growth center strategy.

On the basis of criteria set by the central government, consortia established by local governments to promote development of the economies of their jurisdictions led to the establishment of 42 growth centers. Twelve growth centers, each with populations of at least 200,000, were Areas of Industrial Development, where rapid industrial development and the construction of basic infrastructure were planned; and the remaining 30, with populations of 75,000 people or less, were Nuclei of Industrialization, where firms were expected to be smaller and more oriented to the local market than those in Areas of Industrial Development.

The results thus far of the Cassa program have been mixed. Industrial output, incomes, consumption and employment in the South have improved greatly since 1950. However, the considerable gaps which still exist between economic conditions in the North and South are likely to take a long time to narrow substantially.

Spain has also had experiences with growth centers. The economic centers are widely dispersed with poor transportation links among them. There are wide disparities in incomes and standards of living among the regions, and industry tends to be regionally rather than nationally oriented. Integration of the economy is a major objective of the national plan.

To achieve this objective, specific locations have been chosen for development. These locations have been divided into three types: (1) development poles (or development centers), (2) poles of "decongestion" (industrial satellites of Madrid), and (3) zones of "preferred location" (rural growth centers). The main criterion for selecting a site for a pole or center is location along existing or proposed transport and development axes. Seven centers designated in 1964 retained this designation for periods of five to eight years. Four new centers were established in 1972. The means used to carry out regional development strategy include investment grants, tax and import duty exemptions, and preference in obtaining government credits.

However, the results obtained by regional development planning in Spain have not been encouraging. Only a few jobs, equal to .4% of the labor force, have been created. Few industries have been attracted, with chemicals, metals and food processing accounting for 75% of total investment. In addition, some poles have had severe negative "backwash" effects on their hinterlands.

Several Latin American countries have included programs for regional development through growth centers in their national development plans, with mixed results. In the 1960's, Chile was divided into 12 regions, in addition to Santiago, the capital. A twofold approach was used. The first, in the Santiago area, sought to disperse industrial growth to large urban centers within 70 kilometers of the capital. The second approach identified growth centers in the 12 other regions of the country. Priorities were set for the centers on the basis of their growth potential, and resources were allocated to the centers according to the priorities

fixed. The means which were to be used to attract private industry to the centers included the construction of industrial estates, as well as government loans and exemptions from import duties.

Peru, where the main regional problem is the extreme primacy of Lima, the capital, has set up four regions and six growth poles within these regions. While Lima is expected to remain the administrative and commercial center of the country, the Peruvian approach calls for development of the six poles by the employment of natural resources around the poles, and by the production of industrial commodities for export. Tools to implement this strategy include tax incentives, government licensing of new industrial establishments, and public investment in infrastructure and other facilities.

Colombia has set up nine development regions and has selected a major growth center in each. In addition, a hierarchy of urban places for regional development purposes have been identified. These include centros locales, rural service and market centers; ciudades intermedias, intermediate cities of 30,000-200,000 population; metropolis de equilibier, the designation given to the cities of Medellin, Cali and Barrauquila, which compete with the capital for economic activity; and metropole nacional, the capital city of Bogota.

Ciudad Guayana in Venezuela is a well-known growth center which, unlike most others in Latin America, involved the creation of a new city. The city was formed at the confluence of the Caroni and Orinoco Rivers by linking two existing towns. Ciudad Guayana is intended to become the major growth center for a region rich in hydroelectric potential and mineral, agricultural and forest resources. Through the Corporacion Venezolana de Guayana, the Venezuelan Government has invested heavily in steel mills, natural gas, cement and pulp processing facilities, as well as in infrastructure.

Israel has had considerable experience with regional development. The Israeli experience, which began in 1948, has had several objectives: the settlement and employment of immigrants, overcoming regional inequalities, reducing the primacy of Tel Aviv, occupation of frontier areas for defense purposes, and the exploitation of natural resources in the northern and southern parts of the country.

Mixed results have been obtained from the regional development program. It has been successful in dispersing the population, the dominance of Tel Aviv has been reduced, and the distribution of urban centers has approached the more desirable pattern found in economically advanced countries.1/

1/ In these countries the hierarchy of urban communities tends to be ranked in log-normal ordering, i.e., the second largest city has half the population of the largest city, and the third largest city has one-third the population of the largest city, and so forth.

However, for several reasons, the new towns have failed to develop as rural service centers. For one, the rural villages (composed of privately-operated farms in cooperative communities known as moshavim) generally belong to stong organizations in Tel Aviv which provide them with marketing and purchasing services. Consequently, they have little need for the services which the new towns were designed to provide. Secondly, many of the towns are too small to provide an adequate range of services. It is now clear that it would have been better if the planners had provided fewer small towns and more larger-size towns, which provide more and better services, amenities and a better industry mix than the smaller centers. Thirdly, Israel's small size and good road system combine to give farmers easy access to the larger cities and thereby reduce the need for local services.

In Ghana, the displacement of about 80,000 people from some 700 villages as a result of the flooding caused by the construction of the Volta River dam at Akosombo, provided an opportunity to resettle them in fewer but larger centers in a network of hierarchically-arranged centers. The objective was to create a system of rural communities which would be amenable to the modernization of agriculture through the introduction of improved techniques for the production of food grains and livestock. To achieve this objective, planners devised a stragegy for creating a network of rural townships connected by a transport network with one another and with the rest of the country which included the provision of farmers in the region with material inputs; labor, especially trained labor to operate mechanized equipment, marketing and related services; and technical assistance facilities.

The region was divided into seven subregions, and in each subregion a hierarchy of centers composed of (a) a central town, (b) a service-center village, and (c) satellite villages were established. The central town of each subregion, with a population of about 10,000, located where the best combination of water supplies for industry, road and water transport, minerals and agricultural raw materials was available, was intended to provide facilities for government, industry and trade for its subregion. The service-center villages, with an average population of 8,000 and not less than 5,000, were to be local centers of trade, indigenous industry and education. They were also to serve smaller settlements and provide services for agriculture and the fishing industry within a radius of 10 to 15 miles. The satellite villages were to be located in areas of intensive agricultural activity where processing plants using local agricultural raw materials would be established. A total of 52 settlements were set up, each with its own sanitation and water facilities, market stalls, and at least one school. Higher order centers had community centers, civic buildings and health clinics. However, many settlements are not doing as well as had been hoped. In part, this appears to be due to a lack of financial resources, but other factors seem to be involved as well, since at least in one "trading center" laid out by the planners, traders preferred to settle in shacks a short distance away, at a ferry landing. (43, p. 268)

The experience in Israel and Ghana demonstrates that it may be rash to create a town where the need for it is not real. There are other examples of abortive "planners towns." In the Bemba area of northeast Zambia, planners attempted to establish a town in the countryside to off-set the tendency of the Bemba people to migrate to the Copperbelt towns. The new town was equipped with electric power facilities, a secondary school and other attractions. But it did not succeed in achieving the planners' objective. The town of Jinja on Lake Victoria in Uganda is another example. A great deal of study is needed to identify the critical factors which are likely to enable or prevent urbanization in a given rural area before a commitment is made to establish a new development or trading town. (43, p. 268)

Other countries are experimenting with growth center approaches to regional development. For example, Mali, assisted by U.S. Agency for International Development, is carrying out a rural growth center project at Djoliba, a village of 1,600 persons on the Niger River, approximately 45 miles from Bamako. It is hoped that the center will have a population of 10,000 in 25 years.

In India, the Community Development Department of the Ministry of Agriculture, assisted by the Ford Foundation, is initiating a rural growth center program whose "objectives are to improve the distribution of agricultural inputs, the marketing of agricultural produce and the delivery of health care and education, as well as to foster the development of agro-cottage and small-scale industry in rural areas and small towns."

A pilot program to be carried out in 20 development blocks, has four components: (1) the collection of data required to prepare a profile of each of the 20 areas and to identify a three-tiered hierarchy composed of (a) villages, (b) large-size villages which can be developed into market towns, and (c) towns;1/ (2) preparation of a settlement plan for each of the 20 areas which includes the relationships of each settlement with its hinterlands and the other settlements; (3) preparation of sector plans, the construction of the infrastructure and facilities required; and (4) preparation of area plans for integrating settlement and sector plans. Since implementation of the plans will depend on investments by the state and the private sector, the outcome will depend on the success achieved in convincing state and private agencies to carry out investments in accordance with the integrated plans.

In its Fourth Five-Year Plan, Nepal is taking a comprehensive approach to implementing a growth center strategy in order to integrate the northern and southern regions of the country. A series of north-south roads are to constitute "development corridors," along which urban areas where agricultural processing, marketing

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1/ The work for the first component was carried out in 1970-74.

facilities and resource-oriented industries will be established as growth centers. The Fourth Plan identifies four geographic areas of the country and the center for each. The planners hope that the growth centers will facilitate the transfer of rural people to urban employment in agriculturally-based and other industry, and prevent over-concentration of population and economic activity in Kathmandu, the capital, and along the southern border with India.

c. Critique of Growth Pole or Growth Center Approach

The few countries which have begun to plan for regional development and the mixed results they have obtained give evidence that the state of the regional planning art in less developed countries is in its infancy. The experience of economically-advanced nations in dealing with problems of lagging regions suggests that attempts to restructure the regional organization of an economy after the regional economies have been established by investments and inter-relationships, are likely to be extremely costly and only marginally successful. In less developed countries where there is little fixed investment thus far, opportunities exist to structure investment in ways which will prevent or at least reduce the probabilities of undesirable regional inequalities. Although the dispersion of economic activity to centers away from a primary city may be inefficient in the short-run, it may be desirable in the longer run because of more balanced development of the regions of a nation.

Nevertheless, it is by no means clear that the way to start development of a region is by making some provincial large village or small town grow rapidly by the infusion of primarily industrial inputs along lines espoused by advocates of growth pole or growth center theory. Industries may not find it easy to expand in an urban environment if there has been no prior agricultural growth in surrounding rual areas. In such cases, industries may find it difficult to establish linkages with the rural areas and end up as isolated outstations of the modern sector in an unchanged environment.

Moreover, there is evidence that regional development can originate in rural areas and stimulate industrialization in nearby urban locations.

4. Problems Posed by Regional Planning

The great attention which governments are giving to sub-national regional development portends a further increase in regional planning in general and regional agricultural planning in particular. However, more regional planning raises serious technical, social, political, financial, organizational and other problems.

a. Size and Definition of a Region

There are, for example, the problems of the appropriate size and definition of a region. In general, the appropriate size of a region is one which is not so small as to lead to undue fragmentation of national agricultural planning efforts, yet small enough to permit rapid feedback between farm units, on the one hand, and regional planners on the other.1/ In Israel, a small country, the appropriate size of the country's five regions has been determined to be one that includes a series of villages which can be linked effectively through rural centers and small towns to a middle-size town of 15,000-60,000 people. In contrast, in the Philippines, which comprises many islands, the entire Island of Mindanao was originally established as a region (it was later subdivided into four regions). In Italy, the southern part of the country was constituted as a region; in the Netherlands, it was an area to be reclaimed from the sea (polder); in Colombia, it was a valley which determined the Cauca Valley region; and in the Sudan, the Gezira Region was defined on the basis of the irrigation possibilities.

It is apparent, therefore, that a region may be defined in different ways. Its boundaries may be determined (1) geographically, e.g., a valley or river basin, (2) demographically, i.e., an area inhabited by a specific population group, e.g., a tribe or a people with a common language, (3) administratively, i.e., one or more political subdivisions of a nation (states or counties), (4) functionally, i.e., an area in which it is believed that specified functional objectives can best be achieved, e.g., raising the welfare functionally, or an area within the sphere of influence of a particular urban center. (45, pp. 4-5)

Since regional development usually includes a variety of functional activities which may be as different as the construction of irrigation systems and family planning programs, what is the most suitable set of boundaries for one purpose, may differ substantially from what is the most suitable for another. Consequently, the definition adopted for a region is likely to be a compromise which is better for achieving some objectives than others. In practice, the realities in most countries make it necessary to define regions by their political-administrative boundaries rather than by what may be considered more natural boundaries. This is not always bad because the introduction of a new region injects additional "relay"

1/ In India, Profs. Gadgil and Chakravarty of the Planning Commission, have held that activities should be planned in the smallest jurisdiction at which there are no substantial spill-over effects (direct or indirect, good or bad) on territory outside the jurisdiction. However, it should be borne in mind that the lower the planning level, the more partial the planning necessarily is. This is because higher level jurisdictions (e.g., states) plan some activities for lower-level jurisdictions (e.g., districts) which are not included in the plan of the lower jurisdictions. (44, p. A51)

points into bureaucractic vertical communications and clearance structures which may easily become delay points. For these reasons, even if a dominant development activity (e.g., an irrigation area) has contours that deviate so much from existing political-administrative jurisdictions that new regional boundaries seem necessary, the new region should, for the sake of assisting administrative coordination of development activities, be built from multiples or components of existing political-administrative jurisdictions. (44, pp. A42-A43)

b. Definition of Needs and Objectives

A second problem which arises in regional planned development involves definition of the basic social and economic problems to be resolved. Everything depends on who does the defining of the problems, the setting of the objectives and the fixing of their priorities. If officials set objectives and priorities, the results may be different than if farmers set them. These differences may be crucial: Although the officials' objectives may be technically capable of being carried out, they lack the social prerequisite for success which the farmers' objectives provide.

While it is conceivable that central, regional and local officials will define basic problems and priorities the same as the farmers of an area, it is unlikely. The probability of divergence among the different levels, as well as between them and the farmers, is greatest if central authorities identify regional and local problems and set the priorities for them.1/ But the probability is also great that regional officials will define the basic problems and objectives differently and fix different priorities than local farmers. And even if local officials define farmers' problems and objectives, these may also differ from those the farmers themselves identify.

It is easy to see why officials in the national capital may not be in a good position to define priority social needs and objectives for the regions in a country, especially for those regions

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1/ This is because central governments tend to approach problems from a national or long-term point of view in contrast to farmers' more local or short-term point of view. These differing points of view easily lead to government objectives which are inconsistent with those of farmers. For example, farmers may want to increase their cash income as much as possible, while a central government may wish to improve nutrition, reduce agricultural imports, increase agricultural exports, raise the level of living of depressed areas or equalize per capita incomes, all of which might reduce, or prevent the increase of, farmers' incomes. (46, p. 272) Or a government may wish to introduce a new crop and fertilizer, while farmers may want a feeder road and better drainage.

that are remote or inaccessible;1/ it is perhaps less apparent that regional, and especially local officials, may also be unable to define farmers' basic problems and priorities as farmers themselves would, since many regional and local officials have a good knowledge of regional and local problems, and a keen feeling for regional and local needs.2/ Yet, the danger exists that regional and local producers' needs and objectives may be misinterpreted by even local officials. (48, pp. 45-46)3/ Partly, this is because there is often a barrier between officials and farmers which inhibits communication; but mostly, it is because officials, even at local levels, and the farmers they deal with, tend to look at things in different ways because their problems are different.

But if regional or local officials see things differently than producers do, regional and local plans may be formulated to solve problems which the officials rather than the farmers consider important. In Pakistan's Daudzai area, it was found that when a development plan was prepared for the area by local functionaries, "without consulting the people, [it] had nothing in common with the development plan which [later] emerged through the [local] development units in consultation with the people." (37, p. 8)

Too often, planners and other officials appear to view the farmer as someone to be acted upon instead of someone to interact with. They frequently take a paternalistic, or worse, a patronizing view of the farmer and assume that they know his business

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1/ Frequently, the national officials do not see the need to consult farmers about their needs and objectives. If they see the need to do so, national officials frequently consider it sufficient to talk to regional or local officials.

2/ However, even local extension officials can show almost unbelievable ignorance of a local situation. For example, elaborate farm and crop plans incorporating the "package" approach were written out and distributed to peasants under India's Intensive Agricultural Areas Program (beginning in 1964-65). However, since most of the peasants were illiterate, most of the plans ended up unread and unknown, "tucked away usually into the thatch of a hut or inside a clay pot for safekeeping." (47, p. 203)

3/ It is now recognized in India that the failure of the Community Development Program launched in 1952 was at least partly due to an incorrect appraisal of village attitudes and the requirements of agricultural development, despite the participation of local officials. (49, p. 35)

better than he does.1/ These attitudes lead to one-way communication--from the top down--often from a distance, and with considerable gaps in knowledge; there is little return communication--from the bottom up--from the farmer to the planner. What is needed most, therefore, is that planners and other officials learn to listen to farmers simply because the failure to do so produces errors in planning agricultural development. (51, pp. 132-3)

If planning is to be directed toward resolving problems as farmers see them, it must involve participation of the farmers. This implies, first, that farmers must be given a voice in planning for their areas; second, that planning must be "from the top down," to which it is too often limited in practice, if it is to meet social needs and objectives of farmers; and third, that accurate definition of what are the social needs and objectives can only be provided by those at regional and local levels. It also means that the idea that central planners can plan for farmers must give way to the idea they must plan with them, or better yet, help farmers prepare their own plans.

Even when planners recognize the desirability of consulting farmers about their needs, it is difficult for them to give up completely the idea that they know as well as, or better than, the farmers what the farmers' real needs are.2/ Underlying this attitude is the strongly entrenched belief that somehow farmers should be made to see the advantage of subscribing to officials'

1/ One reason which is sometimes given to justify this point of view is that people in rural areas are presumed to be uninformed or apathetic about development. But experience does not confirm this. In carrying out the Daudzai Project in Pakistan, the Pakistan Academy for Rural Development reported that it discovered "that the rural people are in the best position to identify their needs because they have been living in the villages for generations and no one else is more sensitive or alive to their needs....[Moreover, the Academy] also found that they were also capable of suggesting solutions to their problems...." (37, p. 8) What another observer has written about what is now Bangladesh is also true of other places: "Rural development is the development of the rural people, and therefore the most interested party in it must be the rural people themselves. It will be wrong to assert that the rural people do not want to develop and that therefore we have to force them to do so. The urge for development is there in every human being." (Khan, Raja Mohammad Afzal. "Thoughts on Problems of Rural Development. Five Articles on Development Administration in Pakistan. Asian Studies Center. Reprint Series, No. 1, 1966-1967. Lansing, Michigan; Michigan State University, 1967. As cited in 50, p. 25)

2/ Planners are not alone in these attitudes. A United Nations survey of 445 national and foreign advisers reported that for 83 percent of the foreign and 86 percent of the national experts covered by the survey, the question of the "felt needs" of the people concerned with the programs and projects with which the advisers were associated, "the issue simply [was]...not salient for our experts." (52, p. 86)

definition of objectives; it hardly occurs to officials that there might be even more compelling reasons why officials need to see the advantages of subscribing to farmers' objectives!

There is also the fact that even if individual officials do understand these advantages, superiors in their ministries, departments and agencies may not, or the entities concerned may not be organized to do what needs to be done about farmers' objectives. Each organization has its own success criteria for its projects and programs and usually expects its staff to adhere to the organization's criteria of efficiency in dealing with farmers. This imposes a pattern on transactions between officials and farmers which may mitigate against having officials take adequate account of farmers' point of view. (53, pp. 3-5) For example, in Mexico, the Government has sought to carry out a rural development plan which takes account of local preferences. Yet, despite good intentions, rural development plans have generally ended up being formulated for, not with or by, the community. What generally happened, was that an inter-agency team of officials paid a brief visit to a locality to identify potentially useful projects and programs. The team elicited from the people information about what projects were desired and their order of priority. The team then left and drafted a plan, taking into account the people's desires, modified by the team's and inter-agency views about priorities, as well as the resources which agencies considered appropriate for the region. Frequently, however, the plan which emerged was so different from what the people had proposed that they were disappointed.1/ (53, pp. 6-7) In the Daudzai area of Pakistan, farmers gave the highest priorties to land development, water management and communities. Nevertheless, the Manager of the Daudzai Project reported that the provincial Public Works Department was able to provide only little help in these fields, "not because the Department was not willing to help, but for the simple reason that it was not so organized as to be able to help...." (37, p. 7)

The Project Manager also found that farmers in the area often refused to accept government assistance or even to listen to extension advice unless officials first solved the problems which the farmers thought came first--and frequently, the farmers' priorities proved to be better than the officials'. In one village, the seemingly ignorant farmers refused to cooperate with officials' plans to improve production unless the officials first dealt with the sand-dunes which subsequent investigation revealed had blocked local irrigation channels for years. The Project Manager reported that officials in the Daudzai area had many such encounters, and "they learnt the hard way what people demanded [they really wanted] and that what they demanded was the right thing." (37, p. 9)

1/ In one community, the people asked for a dairy and received a latrine! (53, p. 7)

Planners should recognize that in the last analysis, farmers always have a veto over the plans which central planners prepare; and that farmers are likely to exercise their veto when they feel that plans do not adequately reflect their wishes and risks.1/ Since a country's or a region's agricultural output is the total production of all the farms in the country or the region, national and regional agricultural macro-planning must be connected with, and adapted to, the micro-planning of individual farmers in the country or region. (10, p. 1) Only plans which relate macro-planning at the national or regional level with micro-planning at the farm level by taking into account farmers' interests, and the possibilities and limitations of their environment, are likely to secure farmers' active support. (21, p. 51) The crucial problem of agricultural planning is, therefore, to find a way of relating the general needs of a national or regional economy, on the one hand, and the possibilities and needs on the individual farm, on the other. (40, p. 499)

Good planning requires that the human, as well as the physical aspects, be considered, and a good plan takes both into account. Planners tend to concentrate on the physical aspects of agricultural development because most are trained to relate national objectives with physical possibilities for achieving them. Yet, even if this task has been done, success or failure of a plan depends, not so much on the physical possibilities, as on the ability of planners to influence many independent farmers whose cooperation is a prerequisite to the implementation of an agricultural plan. (54, p. 8)

Indeed, the man on the land has to be the center of all planning if more than a sporadic expansion of agricultural production is to take place. (55, p. 269) More than this, by its nature, planning seeks to bring about continuing sociological, institutional, organization and technical change; and these changes cannot be implemented unless the farmer accepts them. (57, p. 1)

To influence the farmer requires an understanding of social, institutional, organizational and political problems which planners, who are mainly concerned with the economic aspects of agricultural planning, do not always possess. Even in economic matters, planners may lack information about farmers' problems and priorities which

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1/ Many examples can be cited to illustrate this point. To cite one example: in Zaire, paysannats were set up in villages to induce peasants to employ improved practices in cultivating their lands. Since the paysannat system involved coercion which the peasants did not relish, it is not surprising that the system gradually disintegrated and finally collapsed entirely.

may lead them to make errors which, in retrospect, seem to have been avoidable. Thus, planners have set objectives which farmers could not be expected to carry out, either because they were inherently impracticable, or because farmers' resources were insufficient. (56, p. 6) Even so sophisticated a group of planners as the Israelis admit they have done this. (57, p. 2) Poor timing of development measures and projects have also led to failures. Resettlement projects have on occasion proved to be premature. Programs have been started to raise yields on land on the assumption that the need was to increase returns to land when farmers were concerned only with returns to their labor. (38, p. 225) In Tanzania, central planners wanted farmers to increase cotton production when farmers' over-riding objective was a secure food supply.1/ In India, planners gave top priority to irrigation when farmers thought the most important problems were the control of floods and soil erosion. (58, pp. 48-50)

Nor can economic incentives always be counted on to bridge the communication gap between planners and farmers. The right economic incentives, applied at the right time and place and in the right amount, can do much to help increase output in accordance with national objectives. But, by the same token, an incentive, directed to the wrong objective because of the lack of the right information, can produce very disappointing results.

A good way of encouraging farmers to take part in the planning process is to have them form their own farm organizations and local bodies headed by their own leaders rather than by government officials. This is important not only to insure that definition of the problems and their priorities conform to those of the farmers, but also to insure the farmers' active and willing support of the plans which are prepared. In the well-known Mexican Puebla Project, Project staff made a strong effort to encourage farmers to form local organizations of their own. By late 1971, 5,240 farmers were participating in 183 such groups. The farmers call meetings themselves and a farmer presides at each meeting. A member of the Project staff is present at each meeting to discuss problems in which farmers are interested and to answer questions. The interest in these meetings may be seen from the fact that farmers convene meetings every two or three weeks. (59, p. 10)

In Taiwan, a strong Farmers' Association has played a major role in the development of agriculture. The Association is a multipurpose organization with three sections: (1) an economic section concerned with the marketing of farm products and with the purchase

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1/ Even when planners correctly gauge that farmers are prepared to adopt an innovation, they may lack the information needed to set incentives at high enough levels to induce farmers to adopt the innovation. Unless planners have sufficient knowledge of available local opportunities, resources, endowments, relationships, and productivities in the existing system and their relation to farmers' priorities, they are unlikely to make the right decision.

of farm supplies and consumption goods for sale to members; (2) a credit section which receives savings deposits from, and makes loans to, members; and (3) an agricultural extension section which provides advisory and training services to its members. The Government's agricultural planners consult with the Farmers' Association about agricultural plans before they are issued and rely greatly on the leaders of the Association to suggest changes in the plans. Indeed, many agricultural programs and projects in the plans are implemented by the Farmers' Association.

A good way of organizing farmers is for them to come together for the purpose of solving problems which they consider to be the most important ones. When these problems have been dealt with, the organization can take up other problems which need solution. Officials concerned with the Daudzai Rural Development Project used this approach. The problem-centered organizations were the first to emerge in the area. They were initially formed to execute land development works which local farmers considered to be the number one priority. Subsequently, they were used for extension education and for maintaining village works. More recently, organizations are coming into existence to deal with credit needs. (37, p. 10) These organizations are likely to produce effective leaders since a poor farmer is likely to be more representative of poor farmers than a rich farmer. Since a truly representative leader and the nominal leader of a community may be different persons, these organizations provide an opportunity for all interest groups among the small farmers in a community to develop the leaders in whom they have the greatest confidence.

Unfortunately, decentralization of the planning process to allow greater farmer participation does not always lead to increased equity because, as one observer of India has written, "it is in local jurisdictions, at least in the countryside, that traditional, grossly unequal status structures are likely to be least distributed and, therefore, most callous in their treatment of the low-end poor." (44, p. A45) Rural elites, who do not yield their traditional privileges easily, have been known to turn producers' co-operatives and other farmer organizations into "vehicles for genteel rural corruption and elitist self-service...." (44, p. A47) For example, in Bangladesh, average membership in the large number of village co-operatives amounted to only about one-fourth to one-third of the cultivators. According to the Bangladesh Planning Commission, "The landless and sharecropping cultivators were not attracted to these co-operatives. In many cases the co-operatives were dominated by traditional power elites in the villages, who used the co-operatives to expand and consolidate their exploitative roles." (60, p. 49)

Yet, experience shows that this need not happen. Organizations can be set up in ways which attract small farmers and repel large farmers. For example, the Daudzai problem-centered organizations already referred to, met weekly and required farmers to make weekly deposits in accordance with well-known cooperative

principles. The entire membership of an organization, which had from 20 to 150 farmers, met as a body each week. The requirement that the full membership attend each meeting prevented the emergence of an unrepresentative executive committee to dominate the organization, a defect from which Pakistan's traditional cooperatives suffered; while the requirement for weekly attendance at meetings and deposits proved to be too burdensome for large farmers who had much less to gain than small farmers from the organization. Consequently, although there was no bar against large farmers, they chose not to join the organization. (37, p. 10)

Such organizations have been found useful for developing representative leadership. One way of doing this is for committees to be set up, with members drawn from the organization, to deal with specific problems. Committees composed of small groups of members encourage both the emergence of natural leaders and widespread participation in the solution of problems.1/

Experience has shown that it is possible to get poor farmers to join economic ventures which raise their economic well-being and increase their voice in local decision-making. The Amal Dairy Cooperative in Anand, one of India's 30 largest corporations, is a good example of what is possible and desirable. The Dairy, owned by some 280,000 small people, one-quarter of whom are landless laborers, and a leadership which identifies with the Cooperative's majority of small members and they with it, is a commercially aggressive and successful enterprise which has made a considerable impact in the region where it operates. (44, p. A47)

Because poor farmers must often be assisted in setting up representative organizations, there is need for effective administrative officials for this purpose. Much more than money or equipment, there is need for persons who can get things done and who can get others to do what is required to help farmers solve their problems and achieve their objectives. Officials, especially those at regional and local levels, are in the best position to undertake these tasks. They can do much to help clear bureaucractic hurdles, organize manpower, and

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1/ According to Dr. Akhter Hameed Khan, who directed the Comilla Project in what was formerly East Pakistan, the experience in Comilla showed that good leadership can emerge from small farmers and that this leadership can be trained to improve the quality and quantity of farm output. Another experienced authority with wide experience in Latin America has urged that every effort be made to obtain the cooperation of a community leader for development projects and programs. He says, "The cooperation of a good leader with good knowledge and well-established relations... was a major factor in the success of our project. After he was convinced of the need and practicability of the project, he would accompany us during the farm visits made to sell the project and to collect the data needed. He was also very useful for calling and organizing meetings." (52, p. 112)

provide farmers with knowledge they need to define their objectives clearly. To do these things requires careful planning, patience, meetings with farmers and other officials, and the willingness of officials to judge their own success by the extent to which they help farmers realize their own objectives. What is needed, is the recognition by officials of the important role they can play as technicians in this process.1/ (58, p. 175) Genuine participatory rural development at subregional and local levels in which the area's important interest groups are all represented is likely to evoke heated and contentious discussions, but it can also be a vital integrative, conflict-resolving force. (44, p. A45)

c. Coordination vs. Harmonization of Objectives

Coordination constitutes a third problem in countries which seek to expand their regional and local planning effort. Regional planning requires coordination because there is always danger that competing regional claims may get out of hand and exceed available resources, or result in unproductive duplication of projects in different regions. Coordination is also desirable where one project concerns more than one region and to encourage regional specialization based on comparative advantage. And while regions must be encouraged to prepare plans based on their own resources, needs and potentialities, they must also be made aware of the importance of reconciling regional and national objectives. Without proper reconciliation, regions may give priority to regional, without regard for national, objectives.

Since in most countries, regions have had to look to their national governments to finance at least a part of their plans, national governments have sometimes been able to use finance as a means of coordinating regional and national plans. Properly used, finance provides governments with a powerful device for coordinating regional and national development plans and objectives. However, when a government's objective is to increase the national income to the greatest extent possible or to reduce the differences in levels of development among regions, the government may not be able always to exercise the measure of control required since regional pressures for funds are often so great that national governments have been unable to resist regional pressures.

1/ As one writer says: "Development can be stimulated and channelized by proper guidance and advice. So the best way to go about it, is to let the rural people themselves decide how they want to develop. The responsibility of the government functionaries will then be to provide them with technical support and such material help as is beyond their means and with which they can exploit their existing resources to become sulf-sufficient eventually." (Khan, Raja Mohammad Afzal. "Thoughts on Problems of Rural Development." Five Articles on Development Administration in Pakistan. Asian Studies Center. Reprint Series, No. 1, 1966-67. Lansing, Mich.: Michigan State University, 1967. (Cited in 50, p. 25.)

"Coordination" implies the existence of coordinators. These usually have been planners or others at the center of the government. They generally have interpreted coordination to mean the use of suasion, economic incentives or varying degrees of compulsion to get farmers and regions to conform to the central government's development objectives. Where national objectives have not been in substantial conflict with those of farmers and regions, the results obtained often have been good, especially when farmers were stimulated by soundly-conceived economic incentives. But where centrally-made plans have failed to reflect regional needs and objectives, farmers and regions have shown little interest in helping implement these plans.1/

There is, therefore, need to establish bridges of communication between national, regional, subregional and local planning bodies and farmers, so that information may flow both ways. Only when there is such a flow of information is it possible to reconcile differences in the objectives of the central government and farmers.2/

The way national and farmers' objectives are reconciled is important. The central government and its planners must, in the first instance, accept farmers' objectives as having as much importance for development planning as the government's objectives. To say this is not to say that governments and planners should not suggest or apply pressure to accelerate development decisions. Rather, their task is to listen to farmers and learn what farmers want. Governments and planners must learn to have confidence that farmers know more about farming conditions in their own community than others.3/ (61, pp. 98-99) If governments and planners have this confidence, the problem is not so much one of coordination, with its implicit subordination of farmers' objectives to those of government, but the harmonization of the two sets of objectives. If the two sets of objectives coincide or can be harmonized, the outlook for agricultural development is bright. If there are substantial differences, the task is to find ways of reconciling them.

If differences between the two sets of objectives are emphasized, reconciliation is likely to be harder than if an attempt is made to find the respects in which the two sets of objectives, or corollary

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1/ In Brazil, when a state has been called upon to implement a plan which was not in line with its own priorities, the federal government usually prevailed, but at the cost of impairing the plan and straining relations between federal and state governments.

2/ Of course, the differences in objectives do not arise because farmers participate in the planning process. The differences, which are there all the time, become apparent when they surface during discussions. By becoming visible, differences have a better chance of being reconciled than when they are submerged. That is one reason why farmer participation in the planning process is desirable.

3/ As one writer says, "...we must study the farmer, not patronize him; and we must assume that he knows his business better than we do, until there is evidence to the contrary...." (62, p. 28)

objectives flowing into them, coincide; or, at least, to find points of minimal differences between the two sets of objectives. If similarities or "points of contact" can be found in the two sets of objectives at some level, every effort should be made to expand the area of agreement.

Harmonization of objectives does not necessarily require that either farmers or government abandon their objectives. Rather, harmonization generally involves compromises about priorities or timing. For example, if government wants farmers to introduce a new crop, say cotton, while farmers want to build a road, and if each believes that their objective would best promote farmers' prosperity, the seemingly different objectives may be reconciled by selecting the course of action (e.g., growing cotton or building the road) which is likely to produce the greatest prosperity for farmers. If farmers' prosperity would be greater in the long-run if they grew cotton but they preferred the greater short-run prosperity which might flow from the road, the difference might be reconciled either by government agreement to (a) guarantee farmers' returns from cotton growing (e.g., by the use of subsidies) or (b) obtain farmers' agreement to introduce cotton in return for construction of the road by the government. A situation very much like this hypothetical example actually arose in 1967 in connection with the Uboma Development Project in the East Central State of Nigeria. In one community, after all efforts by the Project's sponsors had failed to persuade farmers to substitute rice production for that of yams, Project leaders took advantage of the community's desire for a bridge and road across a stream which separated the community from the main raod five miles away. In return for the bridge and the road, the farmers agreed to grow rice. Another problem which arose with another community in the region, was also handled on a quid pro quo basis. This community was going to lose land by submergence under a reservoir to be constructed to hold water for irrigation. This problem was solved after several meetings with the farmers concerned by the signing of an agreement under which the Project's sponsors undertook to stock the reservoir with fish which were to be harvested by each farmer in proportion to his contribution of land for the reservoir. (63, p. F 51)

Whenever farmers' and government's objectives need to be reconciled, it is proper that the government, rather than the farmers, make the greatest concession, sinc governments usually are exposed to a much lower degree of risk than farmers. They consequently can afford to make greater concessions that farmers.1/ On return for its concessions, however, the government obtains the farmers' commitment to the plan because they see its objectives as their own.

1/ One agricultural adviser working in the Middle East suggests that when new farming ideas were to be introduced, small farmers should receive a guarantee against loss if they try new techniques which the government advocates. The adviser felt that to be "important because small farmers cannot afford to make even a small mistake." (52, p. 96)

If attempts to harmonize a government's and farmers' objectives reveal that there is no point at which they appear to be in agreement, this is important for planners to know. It would, of course, strongly suggest that the central government needed to reconsider its objectives if the plan for agricultural or rural development was to reflect regional conditions, needs and objectives. However, it is improbable that some common ground could not be found in most countries in national and farmers' objectives; it is even more improbable that common ground could not be uncovered if the reconciliation process were to proceed with a view to discovering similarities rather than differences in the two sets of objectives.

The approach for harmonizing national and farmers' objectives outlined above implies a relationship among equals. If, as is often true, planners or other officials appear at meetings as donors of funds and farmers as recipients, with no countervailing power, planners and officials may be tempted to exert undue pressure to get farmers to accept objectives to which they do not subscribe. Then farmers are likely to sink into passivity in public in recognition of their subordinate status, but remain unconvinced, with the result that the outlook for realizing objectives diminishes. To be effective, therefore, a system of the kind outlined for reconciling objectives must raise farmers' objectives to the level of official objectives. This requires that farmers, through their organizations, be given considerable responsibility for the choice and achievement of development objectives. In Tanzania, for example, the ujamaa villages participate actively in selecting objectives and then have complete responsibility for executing development programs, including the spending of funds.1/ (64, p. 7) This approach is in marked contrast with prevailing attitudes in many countries. In Bangladesh, according to the Planning Commission of that country, "The people were never trusted (by the previous government). It was assumed that the bureaucracy must have full control over the local institutions, otherwise there would be great misuse of funds and resources supplied by the government." (60, p. 50)

To change this situation, the Planning Commission has called for a new system of local self-government which, if implemented, would raise substantially the status of rural people. The Commission has laid down strict requirements for the system: "The local government body must be managed by peoples' elected representatives and the government officials at the local level must serve under them (underscoring added). Under no circumstances should the government bureaucracy be allowed to interfere with the decision-making functions of the local government bodies. At the village level, decisions must be made by peoples' councils, i.e., the total body of voters in the village assembled in a mass meeting.

1/ Tanzania's national budget is divided into two major parts: sixty per cent goes to the various national ministries, and forty per cent is allocated directy to the 18 regions. (64, p. 7)

Development projects and schemes must be discussed in these meetings before and after execution, and major decisions approved by the people. The peoples' councils should have the authority to call back representatives elected by them to the local government bodies.... The co-operative movement cannot become strong and effective without full political support. At the same time it is important to allow the cooperatives to develop as independent autonomous bodies. The practice of controlling the co-operative by the bureaucracy through nomination of members in the managing committee and various other devices, must not be allowed to happen....In order to make the co-operatives truly peoples' organizations the poorest class should be encouraged and helped to organize and manage co-operatives...." (60, pp. 50-51) Whether or not the plans for the system can be implemented remains to be seen. But it is worth trying.

d. Regional Planning Organization

The need to establish suitable information, coordination and harmonization systems for effective regional planning raises a fourth problem: What kind of institutions are needed to prepare and implement regional and local plans? There is in most developing countries a dearth of subnational planning entities. This means that in most of these countries suitable regional and subregional bodies must be devised and established if effective regional planning is to take place.

Whether regional development plans have been prepared by national as against regional bodies has generally depended on several factors, of which the most important have been the stage of economic development of the region(s) concerned, the availability of regional planners, and the size of the country. As a rule, the earlier the stage of regional development, the greater the likelihood that regional plans were prepared by the central planning agency or by a planning authority established for the purpose by the central government. Conversely, the more advanced the region, the greater the availability of regional planners; and the larger the country, the more likely that the plans were prepared by the regions themselves.

Since regional planning in most mixed-economy countries has been for economically backward areas, with special problems and shortages of financial and human resources, most regional planning has been conducted by central planning agencies or by special authorities created by national governments. Frequently, regional plans have been prepared outside the regions, usually in the national capital, with little participation of the people in the regions. Aside from the fact that this approach has not been very successful in most countries where it has been tried, it is less likely to be used in an era of increasing regional political awareness.

The institutional problem is a two-fold one of finding the right (a) structure and (b) mix between centralized and decentralized authority, self-financing and decision-making. Unless properly structured institutions are set up with the right mix,1/ there is danger that the most logically consistent regional plans will not be operationally feasible. (65, p. 15)

While every country will have to establish planning bodies suited to its own institutional arrangements and stage of development, it may be said that, in general, organizations at the local level should be simpler in form than those at the intermediate subregional level, and that intermediate bodies need be less complex than those at the regional level. For example, at the village level, programming (as distinguished from more professional "planning") committees may suffice, while at the intermediate level (e.g., a district), one or two planners in a small planning unit may be adequate. However, at the regional level, a regional authority, appropriately staffed with planning technicians, is likely to be essential for effective development planning.

Special problems arise in the case of federal governments. India is a good example. In that country, it has been found that the unit of organization for the development of a river valley which extends beyond a single state should cover all the states through which the river valley runs. This unit of political organization could not be the central Government of India since it is too remote to deal effectively with the communities concerned with the river valley. Consequently, an organization with jurisdiction smaller than the central Government but larger that a state government had to be devised. (66, p. 107)

While structural problems can be difficult, they are likely to be easier to resolve than questions relating to the degree of autonomy to be granted to regional planning units and the extent to which these units should be advisory or supervisory in carrying out regional plans. In some countries, these questions have been resolved by the establishment of a regional authority with considerable power and independence. These organizations are generally responsible to the central government, and have authority to act in lieu of regular central ministries, departments and agencies in the region over which they have jurisdiction.

Another kind of authority is advisory in nature, prepares regional plans but relies on regular government ministries, departments and agencies to decentralize responsibility for taking action to their regional representatives, and for the regional authority to coordinate their activities to insure well-phased implementation of regional plans. Unless the regional authority has the right to

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1/ In a country with a unitary government, e.g., Indonesia, the "right mix" is likely to involve a lesser devolution of authority, self-financing and decision-making to the regions than in a country with a federal government, e.g., India.

coordinate these activities, all questions must be referred for decision to ministries, departments or agencies in the capital. Not only is this a time-consuming process, but it may yield the wrong answers because civil servants in the capital are not usually aware of the nature of the problems in different regions of the country. The Settlement Department of the Jewish Agency, which is responsible for rural development in Israel, is an example of the advisory type of authority, although it has some direct responsibilities for rural development, as well as funds for carrying them out.

The extent of a regional authority's effectiveness often depends on the financial resources put at its disposal. Equally important is the way in which funds are allocated to it for implementing plans. The authority is likely to have the greatest independence in implementing plans if funds are allocated to it directly by the central government. The authority is likely to have somewhat less freedom of action if it has to rely on transfers of funds allocated to the various ministries, departments and agencies for projects and programs within its region for whose implementation it is responsible. The authority is likely to have the least independence if it must apply to the budget authority for funds every time it needs money for a project. (67, pp. 4-5)

The location of the headquarters of the regional authority is also significant. To carry out its functions effectively, the authority should be based in the region. Since it is usually more difficult to staff an authority located in a region than one located in the capital, there is a tendency for regional authorities to establish themselves in the capital. But this is a mistake, as experience has shown, because the authority's staff loses touch with regional problems, while the people in the region tend to view the authority as alien.1/ In contrast, where the authority has been established in the region at the start, the population of the region tends to view the authority as its own, and the staff of the authority is in position to take prompter action on problems than if it were in the capital. Experience also indicates that regional authorities located in rural areas can be adequately staffed if regional development is made sufficiently challenging, and higher status, pay, living arrangements and wider opportunities for professional training are offered to technicians than are available in the capital. (67, pp. 9-10)

In some countries, proximity to the budgetary authorities, the seat of power, or other government entities with which the regional authority must deal, may make it essential to have close

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1/ For example, in Guyana, planners in the capital did not know when they set ambitious output targets for farmers in a region that farmers did not have enough guns and ammunition to deal with the monkeys who were consuming large amounts of their crops.

and continuing contact with persons and entities in the capital. In these circumstances, an office of the regional authority, adequately staffed with individuals qualified to deal effectively with those concerned, should be established in the capital. It may even be necessary for the head of the regional authority to spend much of his time in the capital to assure that the region and the regional authority concerned obtain what is required from those in the capital. Even so, and with the assumption that a suitably capable person will always be in charge of the authority's technical staff in the region, the headquarters of the regional authority should be located within the region for the reasons given in the preceding paragraph.

The relationship between the regional authority and the local population and authorities may assume a variety of forms. Where a regional organization exists, and where it represents the people, the most suitable arrangement is to put the regional planning authority in the existing organization. If this is done, there is greater likelihood than otherwise that regional and local plans will come close to representing prevailing views at regional and local levels. In what used to be East Pakistan, the Government was able to organize and participate in carrying out a massive program to develop rural infrastructure by working through existing organizations. (68, p. 162) France also seems to have followed this approach for its regional development programs.

In contrast, a central government may create a regional authority as an arm of the central government in a region to be developed. SUDENE in northeastern Brazil is an example. With this approach, however, there is a greater probability than in the preceding approach that there will be difficulties in communication between the authority and the people.

A third variety of regional authority includes representatives of both the central government and regional farmers. This pattern has the advantage of establishing a communication link between local and central government representatives. Crete and Israel have adopted this approach. (67, pp. 10-11)

Since the first and third approaches seek to relate the people in the regions and local areas directly with the central government, they are preferable to the second. But regardless of which approach is adopted, the regional authority must still take measures to insure adequate participation of producers in defining the basic objectives to be achieved by the planning process.

The difference which producer participation can make is considerable. For example, concentration on traditional inputs in Indian agriculture during the first three Five-Year Plans had only limited success, and the net effect on the productivity of agriculture probably returned very little on cost. (69, p. 105) In contrast, even more intensive concentration on traditional inputs

to Chinese agriculture yielded considerable success. (71, p. 57) The different results obtained seem largely attributable to the emphasis which the Chinese leadership gave to producer participation, (72, p. 222) in contrast to the more passive role which Indian producers played in the application of the inputs.

While each country should create regional planning authorities in a form suitable to its needs, successful regional planning depends on the degree to which regional plans are formulated and implemented with the participation of farmers in the regions or subregions concerned. To the extent that such participation occurs, farmers are likely to be amenable in helping carry out the plans.1/

e. Lack of Regional Information

Planning at the national level has been seriously hampered in most developing countries by the scarcity of reliable statistical and other information. Indeed, the lack of quantitatively and qualitatively adequate data on such basic series as the size and growth rate of national populations, production, investment, consumption and employment has frequently cast doubt on supply and demand projections, as well as parameters included in national planning models. The fact that regional and local statistics in most poor countries are generally much worse, where they exist, than national data, makes it particularly difficult to plan effectively at regional and local levels in these countries. The lack of good data on land use, water resources and manpower constitute an especially great handicap. Even in countries where political subdivisions are defined as agricultural regions, as in India and Nigeria, serious deficiencies in data impede effective planning;2/ and the situation is usually worse when an agricultural region or subregion does not conform to administrative boundaries. Whereas sector planning for agriculture has frequently relied on data from a few experimental farms as

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1/ As one writer says: "Development can be stimulated and channelized by proper guidance and advice. So the best way to go about it, is to let the rural people themselves decide how they want to develop. The responsibility of the government functionaries will then be to provide them with technical support and such material help as is beyond their means and with which they can exploit their existing resources to become self-sufficient eventually." (Khan, Raja Mohammad Afzal. "Thoughts on Problems of Rural Development." Five Articles on Development Administration in Pakistan. Asian Studies Center. Reprint Series No. 1, 1966-1967. Lansing, Michigan: Michigan State University, 1967. As cited in 50, p. 25.)

2/ In India, most of the information collected at local levels has been used by local officials to prepare reports to their superiors in the civil service rather than for dissemination to farmers who need it. Thus, even where knowledge is available, it is not used to build up a fund of data based on local experience. (61, p. 22)

conventional yardsticks for estimating inputs and outputs, regional and subregional planning must obtain field data from actual farms in each area to prepare accurate estimates. This implies that new approaches to the collection of relevant agricultural statistics are required for effective regional and subregional planning. (73, pp. 582-3)

The data gap therefore is a fifth problem confronting those who would expand regional and local planning. The magnitude of this problem and the fact that it will take much time to resolve make it evident that regional and local planning will have to proceed at a lower level of technical sophistication than prevails at national levels and that, for the time being, mathematical formulations of regional and local planning models are likely to be of little practical value in most poor countries, and as one observer said of planning at the district level in India, "input-output tables would be as futile as they would be difficult to contrive." (44, p. A51) Moreover, the more one descends the hierarchy of jurisdictions, the more modest requirements should become for comprehensive planning.1/ Nevertheless, as regional planning in such countries as China and Tanzania has shown, there is no reason for postponing the start of regional planning until adequate data become available. Some specialists become so preoccupied with the data problem that they all but counsel postponement of regional planning until what they consider to be adequate data are produced.

However, in the longer run, if regional and local planning are to become effective development tools, steps must be taken to set up suitable systems for the collection of data which employ uniform units of measurement to allow intra- and inter-regional combination and comparison of data (a) on a continuing basis and (b) for clearly defined regional and local areas. To set up a suitable data collection system for regional planning purposes requires considerable discussion by statisticians and planners of the country as well as those of the areas for which data are to be collected, about the kinds of information required for planning and other purposes and the form in which the data should be collected.

1/ John Lewis, already cited a number of times, points out that while a maximum case can be made for comprehensive planning at the national level in India, at the state level the case for comprehensive "planning is a good deal weaker, and at the district level it is far weaker still." In some states, planning concentrates on a few key sectors, while "by and large, serious district-level planning lies in the future." Dr. Lewis suggests that "the single most valuable and generally useful skill for district planners...would be that of close analytical project eveluation." (44, pp. A51-A52)

Consideration should be given to the preparation of a multi-annual statistical collection plan, including a system of financing its implementation, which sets forth the types of data to be collected and the priorities to be given to each. Since the task of carrying out such a plan is likely to be beyond the capacity of existing central statistical organizations in most developing countries, consideration also needs to be given to the reorganization and expansion of the central statistical office, as well as to the possibility of dividing the task between it and regional statistical organizations in a manner which would promote the most efficient use of scarce manpower and statistical equipment. The work of central and regional data collecting agencies must be coordinated to avoid duplication, gaps in data collection, or the use of non-comparable units of measurement and, in addition, to promote cooperation between statistical and non-statistical agencies in the public and private sectors which collect social and ecnonmic data.

f. Training Regional Planners

Since regional planning is still in its infancy in most developing countries, regional skills and expertise are in short supply. If regional planning is to expand to the extent required, means of training those needed for the purpose will have to be devised. This is no easy matter and constitutes a sixth problem for regional planning.

Because of the variety of skills demanded, training for regional development must be problem-oriented. This implies a multi- rather than a uni-disciplinary approach. While much has been written about the need for a comprehensive approach to development problems, little as yet has found its way into training materials and courses. The same is true about planning "from the bottom up."

Another training constraint has to do with the "labor-intensive" way in which planning, as a discipline, has been taught. Teachers in the field are generally highly-trained specialists whose teaching reaches only a few students each year. Moreover, would-be planners are generally required to undertake a lengthy couse of study to provide them with the ability to formulate sophisticated plans, often based on mathematical models. As a result, the training of planners has proceeded so slowly in the last two decades that there is still a great shortage at the national level in developing countries, and even more, at regional and local levels.

If regional planning is to expand at the rate required to meet urgent demands, a more "capital-intensive" approach to training regional planners will have to be devised than has been used thus far. If, for example, the information which planning specialists have accumulated were incorporated in "programmed" form1/ in teaching

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1/ By which is meant a detailed exposition of the objectives, approaches and methods used to transfer substantive knowledge about planning in the form of individual sessions and groupings of sessions, utilizing task-oriented techniques which reduce the amount of preparation required for teachers of the subject, and permit them to transfer planning techniques by methods worked out by specialists in the "programmed" materials.

materials, teachers in training centers in the developing countries could use these materials to train individuals within regions to prepare and implement regional plans. Only by some such method will it be possible to spread available knowledge about regional planning as widely and as rapidly as is required to meet the demand for more regional planning.

g. Need for a Regional Planning Manual

If regional efforts are to make a substantial contribution to effective allocation of national and regional resources, the central government must establish basic rules applying to regional planning which all regions should follow. Governments sometimes have complicated procedures and requirements, insist on too much detailed information, or do not define with sufficient clarity the technical criteria which regional planners must follow in preparing plans, programs and projects, with the result that regional planning is uninformed and disorganized. To provide regional, subregional and local planners throughout a country with an understanding of what needs to be done and to have them follow the same basic rules a central government should prepare and disseminate a simply written planning manual which includes at least the following:

(1) a statement of the national objectives for regional, subregional and local planning;

(2) a statement of national policies and measures which have been or will be adopted to achieve these objectives;

(3) a statement of the emphasis to be given to the different ecological regions (e.g., rain-fed vs. irrigated regions) by the central government, if the emphasis will differ among them;

(4) a list of priorities for regional planning from the national viewpoint, with an explanation of the rationale for these priorities;

(5) the procedures to be followed by regional, subregional and local planners in preparing plans, programs and projects, the data to be included, and the form in which they are to be presented;

(6) the cost-benefit methodology to be followed in preparing programs and projects;

(7) a requirement that plans be prepared with two alternative assumptions about the size of the plan, one with a higher cost than the other (as specified by the central government), each with a list of projects and programs to which priorities have been assigned [this to facilitate the addition of projects and programs (to the low-cost alternative) or their subtraction (from the high-cost alternative), as the availability of financial resources dictates];

(8) an outline for a regional stocktaking and diagnostic survey substantially like the one in chapter 6 of this work, modified to meet the needs of each region.

For example, farmers' demand for tube-well machinery and other farm machinery and implements induced by rapid growth of agricultural output in what was West Pakistan, and largely accounted for by the introduction of high yielding varieties of wheat and rice in the 1960's, produced a burgeoning of small-scale engineering industry in various parts of the Punjab. In turn, tube wells and other implements produced by small industrial plants throughout the region played an important role in increasing agricultural output. This case is a clear example of industrial-agricultural interaction with, on the one hand, agricultural growth generating demand for output of local manufactures and, on the other hand, the supply of agricultural inputs produced by local industry being the sine qua non for the "Green Revolution" in West Pakistan. The role of small, local industry in helping develop the agricultural sector in the Punjab has been well-documented by Frank C. Child and Hiromitsu Kaneda in "Links to the Green Revolution: A Study of Small-Scale, Agriculturally Related Industry in the Pakistan Punjab," Economic Development and Social Change, Vol. 23, No. 2, January 1975, p. 249-275.

E. Agricultural vs. Rural Development

1. The Role of Agriculture in Rural Development

Regional and sub-regional planning may be comprehensive, in the sense that it covers all functional sectors, or it may be partial when it covers only a few or even one. It may concentrate on rural or urban areas, and within rural areas, on agricultural as opposed to rural development. Agricultural development is an essentially sectoral activity, i.e., one which is concerned with what occurs within the agricultural sector, as usually defined. In contrast, rural development is generally conceived of as a multi-sectoral activity which includes, besides agricultural development, rural industry, the establishment or improvement of social overhead facilities or infrastructure (e.g., schools, clinics, roads, communications and water supply) and welfare services or programs (e.g., for the control of diseases, improved nutrition, widening adult literacy or family planning).1/ While the primary objective of agricultural development is usually increased growth of agricultural output, the primary objective of rural development is the enrichment of the material and social welfare of the rural population, always including poor farmers, and sometimes, landless farm workers and others in rural areas.

1/ Some rural development projects or programs are "selective" rather than "integrated" in the sense that they cover a particular non-agricultural activity like health, education or family planning. However, as generally employed, and as employed here, rural development is an integrated multi-sectoral activity which includes the development of agriculture, social overhead facilities, and welfare services and programs.

Although it may not have been intended specifically, agricultural development has frequently benefitted rich farmers more than poor farmers in developing countries because rich farmers have, and poor farmers often lack, the education, credit, irrigation and other attributes required to respond adequately to new opportunities.1/ This has led the World Bank and other donor agencies and countries to give increasing attention to the promotion of development in developing countries which provide poor farmers with the infrastructure and services required to enlarge their share in increases of agricultural output and incomes. However, prodigious difficulties stand in the way of mounting rural development programs which will provide a sustained increase in the level of welfare of a significant proportion of poor farmers specifically, and the rural poor in general in an underdeveloped country. While governments in these countries may provide social overhead facilities and services to the rural poor, it is difficult to make these facilities and services self-sustaining since, in most instances, they contribute only marginally in the short run to economic development.

Experience shows that for rural development to be self-sustaining, it is essential that it include a self-supporting agriculture which can provide surpluses for financing social overhead facilities and services on a continuing basis. This is so not only because people's expectations about what can be supported become excessively inflated when central governments provide rural areas with water supply, drainage, roads, buildings and other facilities at little or no cost, but also because most developing countries do not have the resources to finance the establishment, operation and maintenance of rural infrastructure and services indefinitely. While it is true that agricultural development, by itself, often ends up by benefitting rich farmers more than poor ones, it is also true that if agricultural

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1/ In its issue for January 24, 1976, the Economic and Political Weekly (Bombay) cites a Reserve Bank of India field study of Small Farmers Development Agencies (SFDAs) which had been established to provide small farmers in India with credit and other assistance. The study, which was of a sample group of 13 of the SFDAs, found that for various reasons, "large numbers of small farmers who were tenants and who deserved every incentive" were kept out of all except three of the 13 SFDAs. The report also found that farmers with land and incomes well above the eligible limits had managed to get themselves included in the SFDAs. Other studies have also shown how easy it is for larger farmers to gain the benefits of projects and programs to the exclusion of smaller farmers. For example, studies of the green revolution suggest that programs which concentrate on the adoption of improved techniques for the use of new seeds and fertilizers have tended to benefit the middle income and rich farmers rather than the poor. In fact, productivity increases that are concentrated on larger farms can undermine the position of small farmers by reducing agricultural product prices, putting pressure on tenancy and restricting the access of small farmers to credit and other resources. (74, p. 43)

development does not have a high priority in a rural development program, rural communities are unlikely to be able to accumulate funds from current income to establish, maintain and operate clinics, schools, access roads and other infrastructure and services. When communities look to governments for continued support, rural development programs become little more than welfare. Tanzania has run into this problem.

Governments in many countries have devoted considerable sums to social overhead facilities in rural areas, at the expense of allocations to improve agricultural production and have ended up with schools without teachers, clinics without doctors and chronic unemployment and under-employment. In contrast, countries with rural development programs which have given priority to production and increased productivity have been able to generate the resources required to finance social overhead facilities. (75, p. 9) For instance, communes in Mainland China have constructed health and education facilities from their own savings. (82, p. 6)

Since self-supporting agriculture is the key to self-sustaining rural development, a rural development model is needed which, unlike the usual one for agricultural development, benefits a substantial number of poor farmers and workers in rural communities. The elements of such a model are suggested by the experience in China (Mainland and Taiwan), Tanzania and Israel, as well as that of other countries.

2. A Viable Model for Rural Development

a. Labor-Using Agriculture

First, since the most abundant resource of poor farmers and rural workers is labor which is often under-employed or unemployed, and since for them capital is relatively much scarcer than labor--low-cost labor-using techniques must be employed to the greatest extent possible in agriculture if poor farmers and workers are to benefit most. While more capital is likely to be used in some countries, e.g., Chile, than in others, e.g., India, the model requires that only small amounts of capital (including working capital) be used per unit of employment and output. Labor-using agriculture which reduces the use of capital as much as possible becomes a convenient medium for promoting a more equitable distribution of the benefits of agricultural growth than can be obtained from capital-using agriculture, since it necessarily requires that those who provide the labor be compensated for their contribution to the production process. At the same time larger or richer farmers, who tend to employ larger amounts of capital in production than small or poor farmers do, sometimes even when the practice conflicts with economic efficiency, thereby exclude themselves from the benefits of labor-using, capital-minimizing agriculture.

b. Small Development Works

Second, since even labor-intensive agriculture is unlikely to provide year-round full employment, "employment generating" minor development works with high labor content (e.g., the construction of feeder roads, irrigation and other waterworks), as well as social overhead facilities (e.g., schoolhouses, clinical buildings) should be carried out with under-employed or seasonally unemployed rural labor. Farmers with time to spare at irregualr intervals are likely to find it easier to contribute their labor to small projects than to larger ones, because large projects frequently require more formal work schedules than small ones. If the projects are timed to provide for peak construction activity during the periods when agricultural activities diminish, they can provide substantial amounts of employment and increased income to farmers and other rural workers. To minimize housing and transport costs, productive activities should be concentrated as much as possible in areas with the greatest excess labor. In addition, local materials should be employed wherever possible, because their use provides employment and reduces transport costs. By using local labor to create some of the infrastructure needed in rural communities, the handicap of under-employment of the labor force can be converted into an advantage. In China, peasants have constructed irrigation, flood control, terracing, and other works and have re-forested local areas. In Pakistan, rural populations at the thana and union levels were used in that country's Rural Public Works program to construct roads, bridges, embankments and other works. (76, pp. 246-247) In India, small capital formation projects have provided supplemental incomes to small cultivators and landless agricultural workers who worked on them. (77, p. 65) In Bangladesh, the First Five-Year Plan calls for emphasis on small and intermediate scale irrigation and drainage projects, and the installation of low lift pumps and tubewells. These are low-cost, labor-intensive activities which are expected to reduce under-employment or seasonal unemployment and provide water for food grain production. (78)

c. Light Industry

Third, small-scale, labor-using, light industries with low capital requirements should be established in rural areas to supplement employment opportunities in agriculture. However, this does not call for decentralization of industry. Decentralization may be desirable from the point of view of regional development, but this is another matter. What is needed is the establishment of specific kinds of light industry in rural areas. For best results, as experience in China and Israel has shown, light industry in rural areas should be mainly of two kinds: (a) the processing of agricultural commodities produced in the area concerned,1/ and (b)

1/ These might include fruit and vegetable canneries, flour and rice mills, wood-working factories, slaughter houses, creameries and milk powder plants, sugar refineries, paper mills and processing units for cotton ginning and edible oils.

d. Self-Help as the Foundation

Fourth, to be self-sustaining, the model must rest on a foundation of local self-reliance or self-help. Simply stated, self-reliance or self-help means that those communities which benefit from rural development must assume responsibility for raising a reasonable proportion of the resources.

The total quantity of resources needed for rural development in most poor countries is likely to fall short of what is needed unless a portion of the money (or labor) required is raised from the countryside itself. One way of doing this is to challenge local authorities and organizations to provide some funds through taxation or otherwise, or labor, with government-matching grants or other appropriately devised incentives to reward those jurisdictions which gather what is considered to be an adequate amount of funds, or otherwise help provide the resources for rural development. (44, pp. A48, A49)

However, while self-help should be a part of every rural development project or program, technical and financial assistance by government is also essential. As planners in the Daudzai area of Pakistan learned, it is "no more than a pious hope...[which] adds to the frustration and disappointment by self-help without government assistance." (37, p. 8) As part of that assistance, it may be desirable to conduct educational programs which teach farmers and their families how to do things for themselves, and to understand that rural development requires a partnership between the rural people and the government.

The people must be made to see that the government will only help a community if the people in the community are prepared to fulfill certain obligations, e.g., to band into organizations which meet regularly, make regular savings deposits to create equity capital or undertake the maintenance of completed works. (37, p. 12) This has been done in China and Tanzania. In Tanzania, attempts are made to bring home to those concerned the fact that they were being educated in order to serve themselves, and that they should not expect anyone else to serve them. (64, p. 6)

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rural-based industries were not only important in producing increased non-farm employment but also made available essential farm inputs at much lower capital costs and smaller foreign exchange content...." (80, p. 251)

What constitutes a reasonable proportion for a community depends on the size of the population, the degree of economic backwardness, its growth potential and other relevant circumstances, but in each situation criteria for judging the success of any rural development program would include measures of the extent to which local or regional areas should be required to contribute to the support of rural social services. A second criterion should indicate the time in which, and the extent to which, local or regional jurisdictions would be required to take over the support of rural facilities which are initially being financed by the central government or other outsiders, and provide incentives for speeding up the timetable fixed.1/

1/ An interesting proposal for quantifying the elements in a self-help formula was devised for Indonesia. The proposal suggests that the central Government make a single development grant to region (province) based on the following elements:

(a) a per capita element to take account of the varying size of population in the provinces;
(b) a "growth potential" element to foster the exploitation of natural resources;
(c) a backward areas element to help the development of transport, communications and infrastructure of poor areas which do not have as yet any identifiable comparative cost advantages under the present state of knowledge;
(d) an incentive factor which would be added to or subtracted from the total of (a) through (c) depending on the increase or decrease in the local authorities' public savings rates.

There are two basic computational problems in the proposal. First, what basis to use for estimating items (b) and (c); and, second, what weight to attach to the various elements. It is not an easy exercise, but the growth potential element could be based upon a simple index of growth poles or centers. Probably there should not be more than three categories--high, medium and low. If, for example, the province of North Sumatra were considered to have good growth prospects because of its good agricultural and tourism potential, it would be placed in the high category; whereas if the growth potential of, say, the island of Flores were considered to be poor, it would be placed in the low category, and so on. Each category would be allocated an amount of rupiahs related to a size characteristic, such as the number of hectares of usable land. The backward area element could be simply a sum of money inversely related to the per capita income below the average (modal) level of per capita income in Indonesia. Thus the amount of this element of the grant would be zero for those areas having a per capita income at or above the modal average, and would be higher the more the per capita income falls below the modal average. Elements (b) and (c) would tend to offset each other. This is intentional: the precise weighting given to each element should reflect the Government's objective functions: the relative weighting which is attached to efficiency and income distribution.

Where regional, sub-regional or local areas are completely dependent on outside grants and loans, rural development planning becomes a matter of drawing up shopping lists for outside funding without the making of the hard allocative choices which realistic planning requires. If the regions, sub-regions and localities are to participate in the planning process, as good planning requires, it is likely that the quality and reliability of rural investment choices, as well as their management, will be improved if the people in the area involved are required to raise and risk significant quantities of their own resources.

Implicit in self-reliance and self-help is the concept of full participation by small farmers, through their own organizations or through other institutions where they feel they can freely express their views and get a sympathetic hearing during the formulation of rural development plans, programs and prospects. How this may be done is discussed elsewhere in this book, but the point needs to be made that without full participation, it is idle to expect farmers to help implement plans, programs and projects which do not reflect their needs and objectives.

Self-reliance is becoming increasingly important as the basis for rural development.1/ Kenya, Tanzania and other countries have emphasized "self-help" as integral parts of their rural development programs. Mainland China has probably gone further than any other poor country in this respect. For example, when major campaigns were launched to control the five major parasitic deseases--malaria, filariasis, hookworm, kala azar and schistosomiasis--great emphasis was placed on having the rural "masses" take specific actions whenever possible, rather than have everything done for them by outside "experts." (81, p. 222)

e. Organization for Rural Development

The preparation and implementation of a program of self-sustaining rural development is necessarily a long-term task which requires much planning and farmers' support. This means, therefore, that it must be a product evolved by the country concerned, as well as its farmers;2/ and by the same token that it cannot be the product of short-term missions of international or national lending agencies. These agencies can do much to support rural development by financing

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1/ For example, as already indicated, in China communes can expand health and educational facilities only from their own savings. However, the county government provides teachers and doctors once a commune has built the basic facilities. (82, p. 6)

2/ Experience in Africa confirms what common sense suggests: unless social services are designed to meet the demands of the rural population, they are unlikely to be viable.

components of rural development programs, but it would be unreasonable to expect them to provide the continuing, long-term effort which viability requires. Only the country concerned can do that.

That effort also usually requires major adjustments in government organization and procedures. This is so because each ministry, department or agency tends to concern itself only with its own funtional sector or sub-sector. However, a rural development program requires coordinated action among ministries, departments and agencies which cuts horizontally across the vertical organization typical of most governments.

Experience in countries like Mainland China, Taiwan and Israel makes it clear that where rural development has been adopted as national policy, it is normal for government structures and procedures to be adjusted accordingly. Each ministry establishes appropriate groups and administrative procedures to facilitate the coordination of its own activities with those of others on a continuing basis. Moreover, at national and regional levels, interministerial or other bodies, under the chairmanship of the minister of agriculture or another suitable person, are established to synchronize the related activities of the different ministries, departments and agencies. Thus, what are exceptional activities for ministries when individual rural development projects or programs are involved becomes normal routine when rural development is national policy.

Organizational structures should be an outgrowth of a rural development program instead of preceding a program, as is sometimes the case. None-the-less, it is imperative to start organizational structures required soon after the inception of a rural development plan, program or project and to make them operable as quickly as possible. This is because it takes a long time to institutionalize the organizations, as well as the hierarchical relations among them. As the sponsors of the Puebla program in Mexico discovered, it is too late to wait until a program has become effective before turning to the task of institutionalizing the organizational structure. Moreover, even when institutionalization begins early in a rural development program, abandonment of support before the organizations have proved themselves viable can jeopardize the future of the whole program. This happened in the case of the Comilla program in what was formerly East Pakistan.

In the absence of a national policy for country-wide rural development, it is unlikely that conventional ministries, departments and agencies will be able to deviate from their normal structures and procedures to deal effectively with the requirements of a rural development program in one or a few regions of a country. This is also true of crop programs, e.g., for high yielding varieties (HYV) of rice, maize or wheat, which may be concentrated in a few regions of a country. In these cases, experience shows that it is best to establish a special agency to deal with the programs

or regions concerned. A wide variety of agencies have been tried. Some of these are discussed below in Section 4 d. of this chapter.

Fifth, therefore, for the model to be self-sustaining, institutional and organizational arrangements must be built into a rural development program or project and sufficiently institutionalized to permit the activities covered by the first four elements in the model to proceed on a continuing basis. These arrangements will necessarily vary from one country to another, but they should include farmers' organizations as well as government and (where pertinent) private agencies and institutions. Too often, the failure to establish the necessary institutional and organizational structures to allow rural development to become self-sustaining accounts for the failure of otherwise worthy rural development programs.

f. Marketing or Development Centers

Rural development must be seen as a part of regional and national development. If rural development is to proceed beyond limited levels, a way must be found to bridge the wide gap which usually exists between the villages and the metropolis, usually the capital, which characteristically dominates a less developed country in terms of population, economic activity, income growth, decision-making and other development indicators.1/

A modern agriculture presupposes the existence of markets where produce can be sold and where agricultural inputs can be bought; and these markets must be accessible to farmers because their occupation limits their mobility. This means different things in different countries, depending on whether the truck, the horse, the ox-cart, the wheelbarrow, the bicycle or human carriage is the common mode of transporting agricultural produce.

Most developing countries lack a national hierarchy of development centers. Without a well-structured hierarchy of marketing and distribution centers rural farmers, most of whom usually are not within commuting distance of a major city, have to depend on the inadequate marketing and other poor facilities typical of village economies in less developed countries. Because the village market is small, the scale of farm operations tends to be too small to make the adoption of modern techniques practicable. Moreover, monopoly conditions in the villages keep produce prices low, thereby reducing farmers' incentives to adopt improved techniques and expand production. These conditions keep rural areas poor and underdeveloped and impede the development process.

1/ This domination exists even in a country, e.g., Colombia, where several urban centers have the necessary population to support sustained growth, because they lack the infrastructure and scale of economic activity required to be growth poles.

Even when the development process begins in rural areas, the diffusion process seldom proceeds beyond the immediate area around the primary city and large parts of the country are outside the growth area. Even where several urban centers exist, the absence of a hierarchy of regional distribution and collection centers may impede the integration of rural areas into the regional and national economies. This was a major problem in India in 1965 where only 2,442 middle-size towns of 5,000-50,000 people provided the link between 248 large urban centers of over 50,000 people and the 564,718 villages. (83) In a country in this situation only villages close to urban centers can be integrated into the regional economy through the wave-like diffusion process. The rest of a region is likely to be left out of the market economy and remain at low levels of technology and subsistence.

The establishment of an appropriate hierarchy of development centers therefore constitutes the sixth and final element of a viable rural development model. Israel has the longest and most comprehensive experience with the development of hierarchies of development centers. To fill the gap between the rural villages 1/ (A-level centers) and the metropolitan centers (E-level centers), three intermediate types of centers were developed: rural centers (B-level centers), rural places with a population of a few hundred persons, each of which provides basic agricultural services, a primary school, a cultural center and a dispensary;2/ small towns of 6,000-12,000 people (C-level centers), which provide more advanced services in a 6-10 kilometer radius; and middle-size towns of 15,000-60,000 people (D-level centers) containing central regional institutions and services.3/ Figure 2 shows the Israeli center hierarchy in graphic form.

Policies to implement the regional development program included the settlement of new immigrants on farms or providing public housing and employment for them in the small-and medium-size towns (C-and D-level centers, respectively); as well as the construction of infrastructure and the provision of economic incentives to attract private industry to the towns.

3. Applying the Model

Experience indicates that the combination of (1) labor-intensive agriculture; (2) labor-using minor development works; (3)

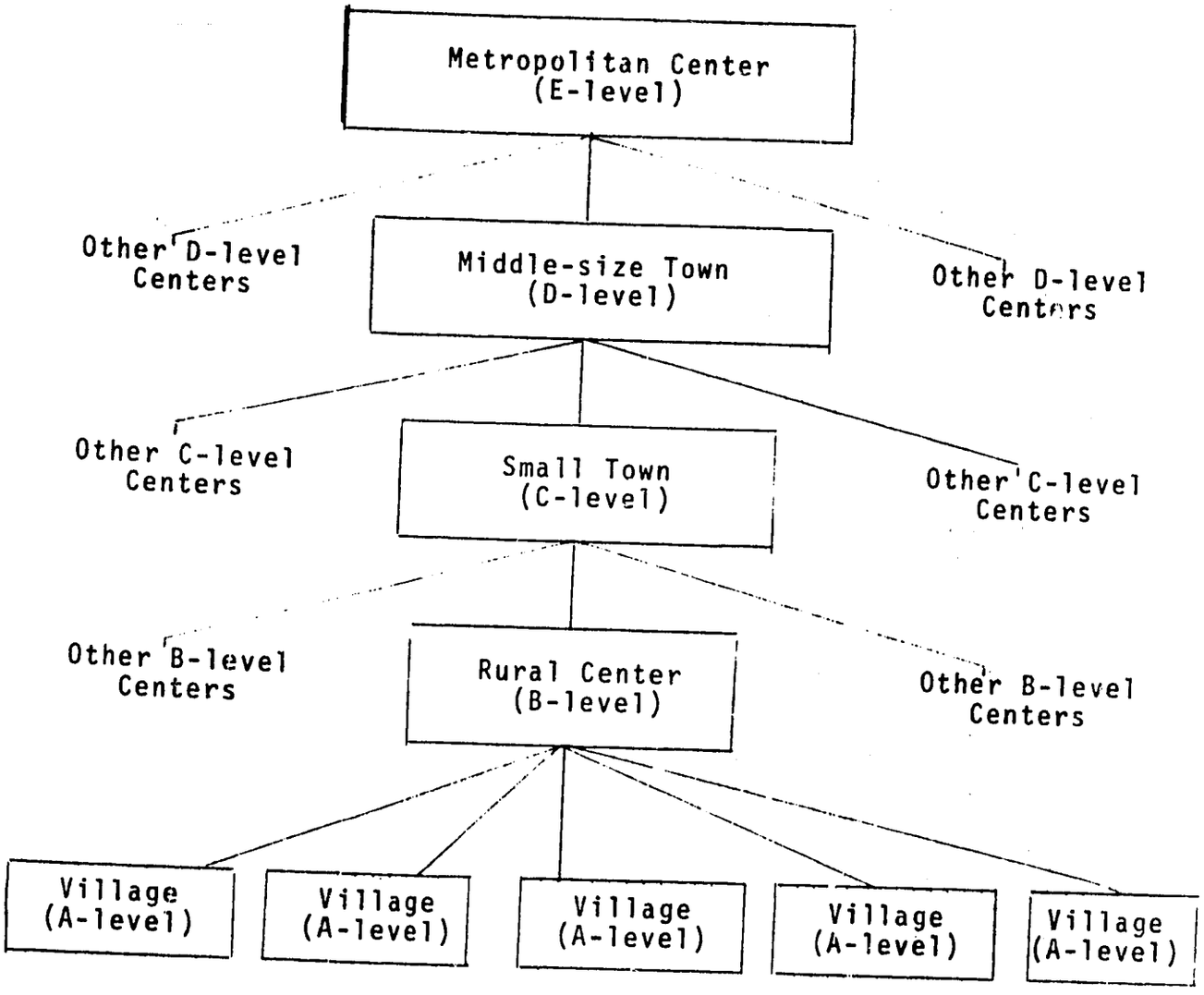
1/ The size of a village varies in accordance with the types of farms in the area (e.g., dairy, citrus or industrial crop). (84, p. 272)

2/ Sometimes, the rural centers are occupied only during daytime, their small service population dispersing at each working day to the neighboring towns.

3/ A D-level town (e.g., in the Lakhish Region) was designed to service from 3,000-5,000 farm families.

FIGURE 2

ISRAEL'S HIERARCHY OF CENTERS



agriculturally-oriented, small scale light industry, using labor-intensive techniques with low capital requirements; (4) in an atmosphere of self-reliance; (5) the early incorporation and institutionalization of essential organizational arrangements; and (6) the establishment of a hierarchy of marketing and development centers offers the best prospect for developing a self-supporting agriculture which can, in turn, provide increased incomes for poor farmers and rural workers, as well as the necessary savings for the social overhead facilities and services required for self-sustaining rural development.1/ Since self-supporting, labor-using agriculture is the backbone of self-sustaining rural development, it should have the highest priority of all the elements in the model; and since it is difficult to organize effective agricultural development based on labor-using techniques, time should be allowed to make it viable. The precise combination of agriculture and industry, as well as the timing for introducing industry, will depend on the circumstances in each country.2/ While government may find it expedient to make available some social overhead facilities and services,3/ these should be correlated with the development of the agricultural component over time to insure that earnings from agricultural output in the area will be sufficient to take over support of these facilities.4/

1/ Although the ultimate solution to rural under-employment in many countries probably lies in the permanent migration out of agriculture of labor not required for farm production, a viable program of rural development can provide preparatory training for rural workers who eventually migrate to urban centers and spread migration over time. (20, p. 54)

2/ In Pakistan's Punjab, farmer demand led to the establishment of more than 100 small factories employing a total of over 1000 workers to produce diesel engines, principally from local materials, for tube wells and grain mills. (85, p. 56) In the Punjab of India, which has a dynamic agricultural sector with a broad-based distribution of income, there was a significant increase in the effective demand for consumer goods and services. Some of these, like milk and milk products, were old items of consumption, while others, like bicycles and sewing machines, shoes and soap, were new consumption items. Often, increased demand and consequent increase in the profitability of investment brought about a significant mobilization of rural savings for the provision of goods and services.

3/ The provision of social services in rural areas of Africa has been found to be effective in sustaining people's interest in development projects and in mobilizing self-help efforts in rural areas, particularly for capital works projects.

4/ Experience in Africa leads to the conclusion that unless the rural community accepts the principles of self-help and self-financing, social services are unlikely to be viable.

While the foregoing description of the rural development model draws mainly from the experience of Mainland China, Taiwan, Israel and Tanzania, the model is not exactly like those used in any of these countries. Rather, its six elements constitute a composite based on what appears to have been successful in these countries, as well as in others, including India, Pakistan and Malaysia. As an eclectic construct of the apparently successful elements in rural development programs in several countries, it is not presented as a model to be followed in its entirety by any country. Rather, its elements are intended to suggest attributes which a developing country might find useful in devising a rural development model of its own. One or more elements in the model may be considered unsuitable to conditions prevailing in a specific country; and elements considered suitable probably would have to be modified and adapted to prevailing circumstances. Nor is it likely that attempts to apply the model, or even features of it, would prove successful in countries where the land tenure system or other circumstances are incompatible with viable agricultural or rural development. In every country, consideration needs to be given to the situation in that country--to the way in which land is held and worked, the climate and ecology of the country, the state of under-development, the quantity and character of under-employment of rural labor, and the extent of the commitment of the political leadership, before it is possible to formulate a viable rural development program for that country.

Nevertheless, the successes achieved in the countries from which the various elements are drawn recommends the model as a guide to developing countries in search of a viable approach to rural development. Its components collectively constitute the best approach to viable rural development which experience has to offer.

IV. PREPARING AN AGRICULTURAL PLAN

A. Components of a Plan

While writers on agricultural planning frequently refer to the need for preparing plans which can be carried out, they usually concern themselves much more with the niceties of formulating a good plan than with the details of implementing it. This is evident in their preoccupation with the need to link agricultural sector plans with overall plans; comprehensive as against partial plans for agriculture; the lack of statistical data for preparing plans; methods of making long-term demand and supply projections for agricultural commodities, and so on. However, except for *en passant* warnings that they are essential, one finds much less in the literature about how to devise appropriate strategies and policies for implementing plans; how to identify and prepare a stock of well evaluated projects in sufficient quantity to permit intelligent choices to be made about them; how to stimulate agricultural producers to increase investment and output; or, precisely how administrative procedures must be changed and what organizational and institutional adjustments must be made to achieve sector goals.

There is, of course, a good reason for this. It is easier to formulate a plan than to prescribe, in sufficient detail to permit action to be taken, exactly *how* to put into effect what must be done to reach planning goals, precisely *who* is to be responsible for what, and to give the sequence and latest dates when action must occur if the plan is to be implemented within the planning period.

This is not to say that good plan formulation is easy or that it is less important than plan implementation. Rather, it means that not enough consideration is usually given when a plan is formulated to the spelling out of ways of carrying it out. Because of this, many plans never have much chance of being implemented. Plan formulation and provision for implementation are inseparable. If this were well understood, plan formulation would be even more difficult than it is now. But it would be more realistic.

Because implementation is the test of an agricultural plan, a good one, whether within or outside the context of an overall national or regional development plan, should have many more components concerned with its implementation than with its formulation. The following list of twelve components to be included in an agricultural plan includes eight (Nos. 5-12) which refer to plan implementation as compared with four (Nos. 1-4) which refer to plan formulation.

(1) Sector development objectives
(2) A stocktaking and diagnostic survey

(3) A set of targets
(4) Selection of a strategy from among available alternatives
(5) Policies for achieving program objectives and targets
(6) The projects and programs to be carried out in agriculture, as well as in related sectors (infrastructure) to achieve the plan's objectives and targets
(7) Research and studies to be carried out to acquire the technical knowledge required for development of the agricultural sector
(8) A program of public expenditures for financing for each year of the plan period, including the source of financing
(9) A program for training manpower required for agricultural development
(10) Organizational, institutional and administrative improvements required to implement the program
(11) Consultancy services required to carry out the program
(12) A system of evaluating progress

B. Planning Sequence

The sequence in which the twelve components is listed is significant. Some things should be done before others, although often tentatively, because those components which follow the earlier component(s) logically depend on the preceding one(s). Thus, the setting of development objectives for agriculture should precede the stocktaking and diagnostic survey because one objective requires information for its realization which may, and often does, differ from information required for the realization of other objectives. For example, the information needed for achieving a reduction in inequalities of farmers' incomes will differ from the information required to achieve increased agricultural output.

The setting of sector objectives should also precede fixing of targets (since targets are really quantified objectives); just as the organizational and administrative implications of projects and sub-programs which are to be carried out should be considered before organizational responsibilities are assigned and technical assistance requirements are determined. Unfortunately, this sequence is not always followed.1/

1/ In Morocco, a program for reorganizing the organizational machinery concerned with agriculture was prepared in 1967 before the objectives of an agricultural development program had been adopted.

Sector surveys are made and targets are set without clearly defined objectives; economic policies and measures are adopted without reference to the requirements for achieving targets; and new agencies are established or existing ones are reorganized before the tasks which must be carried out to implement the sector programs have been defined.

However, although some aspects of sector planning logically precede others, it would be a mistake to suppose that no deviation from the suggested sequence is permissible, and that each component must be dealt with consecutively in the order given, one at a time. The nature of the planning process is such that work on some components low in the list may have to begin before work starts on others higher up. This may be true, for example, in the case of projects, the gestation period of which frequently exceeds the time it takes to prepare most other parts of an agricultural plan.1/

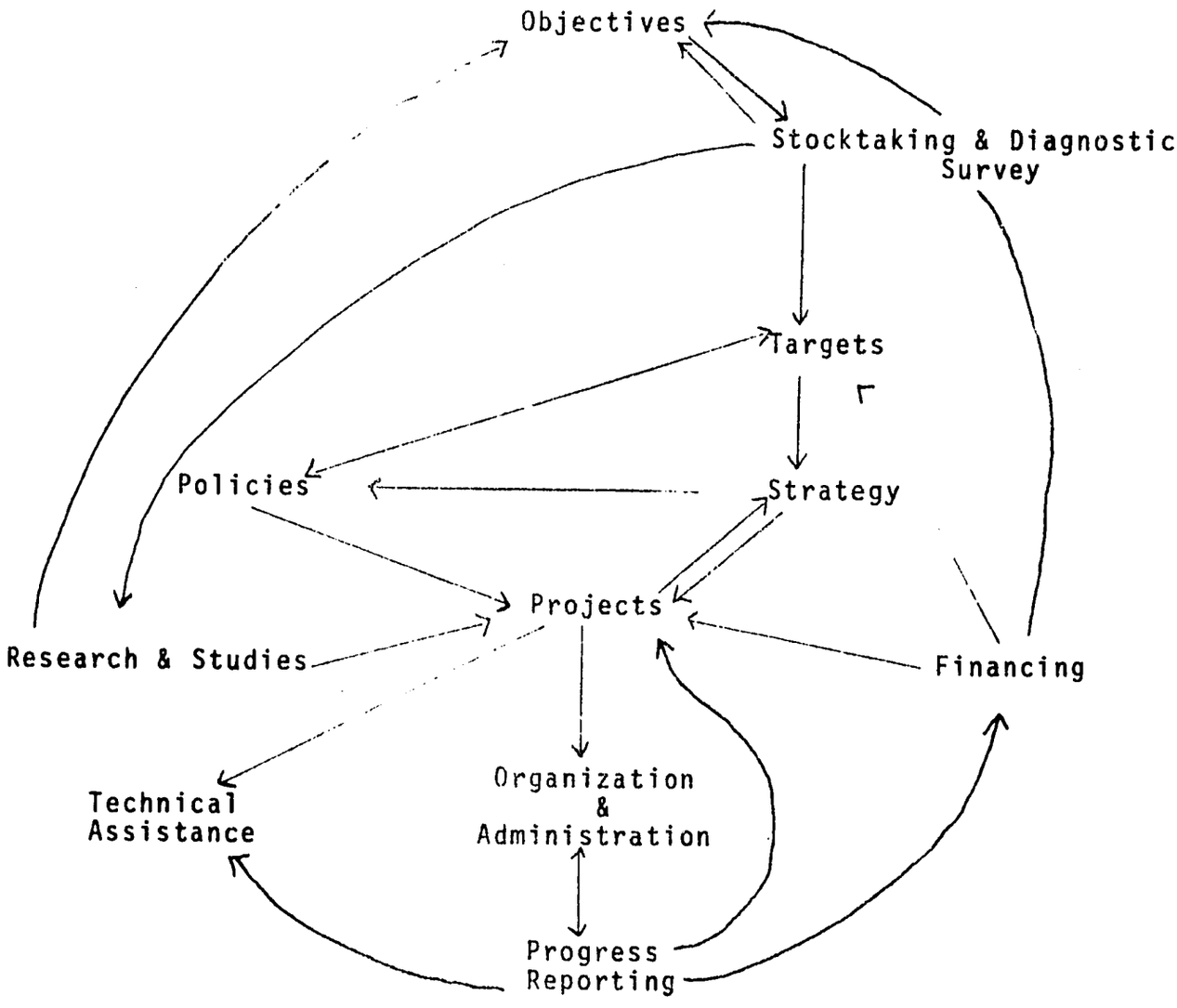
Usually, work must proceed simultaneously on two or more components, with the emphasis changing from one component to another. This is because sector planning like macroeconomic planning, is a continuous process, with inter-related and mutually interacting elements. This implies that if a consistent plan is to be obtained, each component must be coordinated with the others. Thus, targets may have to be altered as planning proceeds if the strategies or policies required to achieve them are politically or otherwise unfeasible; projects may have to be reduced in number and size, as well as in speed of construction; a development strategy may have to be modified on the basis of rates of return realizable from available projects; and even objectives may have to be revised or discarded if, for example, investment resources prove to be insufficient. Conversely, additional investment resources may have to be found to permit the retention of objectives, targets and projects which are considered essential.

In short, planning for the sector starts with assumptions and speculations which may turn out to be untenable and proceeds by a process of iteration or successive approximation to what is tenable. First estimates for each component can only be considered to be tentative and preliminary, subject to revision as planning proceeds, with the final form emerging at the end of the process instead of at the beginning. (86, p. 60) Figure 1 illustrates how the inter-relationships among components affect the order in which they may have to be considered in a hypothetical situation.

1/ In Iran, preparation of the agricultural program included in the Second Plan for 1962/63-1966/67 took 18 months, but the preparation of some projects in the program took several years. (30, p. 57)

FIGURE 1

ILLUSTRATIVE INTER-RELATIONS AMONG PLAN COMPONENTS



V. OBJECTIVES FOR AGRICULTURAL DEVELOPMENT

A. Who Sets Objectives

Even the objectives first set for agricultural development must be considered to be preliminary ones subject to change. Although the setting of objectives logically precedes all other components in the planning sequence, objectives should not be fixed without taking due account of sector conditions and potentialities. It is therefore desirable for agricultural planners to provide those who select the objectives with guidelines which will help them make rational choices. The guidelines should include information about the principal agricultural problems, feasible alternative solutions, and estimates of the resources required and likely to be available for this purpose under different assumptions. 1/ (86, p. 60; 87, pp. 555-556)

A plan for transforming agriculture carries a price which farmers, land owners and urban dwellers pay in varying proportions. Future benefits must usually be paid for with present sacrifices. The process by which increases in agricultural output and incomes are accelerated tends to destroy traditional ways:

> The role of the family, the relation of sons to fathers, the social hierarchy of the village, the roles of moneylender and landlord, the political sensitivity of farmers--all these, and many other aspects of existing rural societies will almost certainly undergo major change as agricultural development takes place. (8, p. 2)

Because choices which must be made to bring about basic agricultural change are fraught with grave social, political and economic

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1/ The setting of even preliminary objectives implies knowledge of which are the major problems in the agricultural sector, whether these be excessive unemployment or underemployment, a greatly skewed distribution of incomes among farmers, low levels of output and productivity, or the lack of foreign exchange because of low levels of income from exports of agricultural products. And since the major problems in the agricultural sector are usually quite clear, it is reasonable to expect that the information required to set preliminary objectives is available in most less developed countries.

implications, the responsibility for setting agricultural development objectives must rest with the political leadership of a nation. The extent to which the political leadership understands the implications of the objectives it selects, and accepts responsibility for them, is a good rule-of-thumb test of the seriousness with which it intends to pursue their realization. If the political leadership does not grasp how large is the scope and how far-reaching are the implications of their objectives; or if it evades responsibility for them, for example, by permitting those who prepare the plan to fix the objectives and, thereby, accept responsibility for them; there is not much chance that the plan's targets will be achieved. (8, p. 2)

For their part, planners who prepare the plan must realize that it is appropriate that economic objectives conform to social and political objectives, rather than the other way around. Planners frequently find it difficult to accept the subordination of economic to social and political objectives because it may lead to higher costs or lower returns than when economic costs take precedence. But this misses the point, since the prime purpose of the planning process is not to maximize cost effectiveness, but to achieve social and political objectives at the lowest possible cost.

Just as the objectives for agricultural development cannot be left to national planners, they cannot be left to foreigners. This is because how development, and hence its objectives, is defined depends at least partly on a country's values and culture. In the developed countries, development has usually been equated with growth of per capita output and income, or growth with the structural changes which accompany the modernization of a traditional economy. More recently, the failure of growth in per capita output and incomes to improve the plight of most people in the poorer countries has led some economists in developed countries to re-define development as an attack on the worst manifestations of underdevelopment, which are generally taken to be poverty, unemployment and inequality. (88; 89)

But even this definition may be unsuitable. Underdevelopment and development are not absolute conditions which can be measured objectively. Nor is there an accepted set of economic and social indicators which can trace the progress of a country step by step from underdevelopment to development.1/ Underdevelopment must be seen as a culturally-determined assessment of what constitutes an unsatisfactory quality of life. This implies that what is seen as the worst elements of underdevelopment from the perspective of someone

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1/ This is not to deny that there are some indicators, e.g., reduction of infant and child mortality, increased caloric and protein intake, reduction in the unemployment rate and health services delivered, which would be widely accepted as indicators of progress toward development.

in a poor country, and that ways of measuring underdevelopment in a rich country may be inappropriate to a specific poor country.1/ While fatalism, apathy, backbreaking labor and low levels of productivity are features of underdevelopment which rich and poor can agree upon as undesirable, other aspects, e.g., the extended family, tribal and other communal forms of land ownership, or illiteracy may be features which those from rich countries may consider more undesirable than those in a specific poor country.2/ (88; 89)

If, then, underdevelopment is a state of being which can be correctly defined only in a specific cultural context, it follows that development is also a state of being which can be defined only in a specific cultural context. If this is so, then development objectives must be appropriate to that context. They are most likely to be appropriate, and hence most realistic when established by the society concerned. However sensitive a foreigner may be, he is almost always limited by the cultural values of his own society. He may therefore opt for ways of developing a country which are not significant for the poor society. If so, scarce resources will be wasted. More importantly, development objectives and programs based on foreign cultural values may generate change which is incompatible with traditional institutions and ways of behavior. In that event,

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1/ For example, such measures as per capita income, the number of telephones per capita, the number of university graduates, or the number of western-trained doctors per capita are generally more suitable for measuring the level of development in rich than in poor countries.

2/ Because of the absence of tangible benefits to peasants who had had some education, farmers may not look with favor on programs to eradicate illiteracy. Berreman tells how unfavorably government school programs were viewed by the inhabitants in a Himalayan foothill village; and Buitron writes how farmers in Chimborazo, Equador who had participated in an adult education campaign had forgotten how to sign their names after three months because they had no need to read or write. Because of this, Buitron concluded that outsiders had to make sure that they were filling a real need of the people when they introduced new knowledge. He says: "Those who believe that to eradicate illiteracy it is sufficient to augment the number of teachers, better their preparation, and create more schools, are completely mistaken." (90, pp. 53-54)

the changes are either likely to have only a temporary effect (which lasts only as long as the foreigner is around) or, if more permanent, may have an unsettling effect on the traditional society.1/ (89)

As with underdevelopment, there are some aspects of development about which rich and poor can agree, despite the fact that they rest on value judgments. Thus, more of what both consider good is generally better than less; more of what is good is better for many people than for a few people; life is better than death; a long life is better than a short life; health is better than disease; and a culturally rich life is better than one that is culturally barren.

But when one goes beyond these general assumptions to determine the means of achieving these improvements or to specify exactly what constitutes a "culturally rich" life, one enters an area in which different cultural values are likely to yield different development objectives. (88) Even if there is agreement between the nationals and foreigners about what is important, the priorities may be different, with nationals likely to give higher priority to "intangibles" and the foreigners likely to give higher priority to the more "tangible" aspects of development. 2/ The following statement from the set of guidelines of the Tanzania African Nationalist Union (TANU), the Government party, issued in February 1971 and known as Mwongozo, provides an insight into Tanzanian priorities, priorities which are not likely to be shared by most foreign advisers: "Any action that gives [the people] more control over their own affairs is an action for development, even if it does not offer them better health or more

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1/ The literature is replete with errors made by uninformed foreign experts. For example, in China some years ago White Leghorn chickens were introduced because the expert concerned considered the breed ideal for the locality. What he did not know was that there was a local tabu against raising and eating white birds. Similarly, in parts of Mexico attempts by outsiders to get Mexicans to raise pigeons and doves were made without knowledge that these birds are believed to bring bad luck in the form of illness, death or desertion by one's spouse. As a result, both programs did not do well. (90. pp. 50-51) In an African country, a donor country invested almost $500,000 in a poultry project designed, among other things, to provide eggs for the people of the recipient country, before learning that the people avoided eggs because they believed that pregnant women who ate eggs would bear deaf-mute children; and that generally men would not eat eggs for fear of potential ill-effects on their offspring and even upon their own virility. (91. pp. 32-33)

2/ For example, governments in some countries give higher priority to educating the young in religious principles than in the principles of economic development, while foreign advisers might reverse these priorities.

bread."1/ Mr. Paul Bomani, the Tanzanian Ambassador to the United States expressed a similar sentiment when he said, "Much to our disappointment, we are not getting much aid and assistance, but we don't care. If aid would enslave us we would rather do without it." (64, p. 9)

Thus, it is not always tradition, which foreigners frequently decry as the "dead hand of the past", which shapes a people's attitudes. The experience of a people may play as powerful a role as tradition in shaping social, political and economic attitudes. Foreigners may accept experience as a more rational determinant of attitudes than tradition, and may even applaud attitudes founded on experience. But the point is that foreigners (or other outsiders), not having had the same experience, may be unaware of it as a determinant of a people's attitudes or, even when aware of it, unaware of the potency of the experience as a determinant of behavior. Dr. Ernest E. Neal, a U.S. Agency for International Development specialist who saw considerable service in developing countries, illustrated these points in telling the story of a group of black farmers in the State of Texas in the United States who insisted on the establishment of a cooperative grocery store in their area after World War II despite attempts of "experts" to dissuade them because of the high mortality of cooperative grocery stores. The experts tried hard to convince the farmers to start a production and marketing cooperative instead, because experience showed that this kind of cooperative had a good record. But when the farmers persisted in their demand for a grocery store, Dr. Neal inquired and discovered that during World War II, the farmers had seen the white owner of the local grocery store sell scarce goods to white farmers after telling black farmers that they were unavailable. The grocery store owner also addressed the black farmers' wives by their first names, never as "Mrs.," which the black farmers considered disrespectful. The cooperative grocery store was established after being financed with farmers' savings and aided by volunteer workers. So great was the local enthusiasm for the store that it not only prospered, but became a social center for the black farmers at night and for their families on weekends. Only the black farmers knew how much they wanted that grocery store! (92, pp. 12-13)

1/ This point of view arises from the conviction of Tanzanian leaders that economic progress in Tanzania cannot occur unless Tanzanians are freed from all vestiges of neo-colonial dependence and subservience and that "development means liberation." The Tanzanian leadership apparently is prepared to pay the price of a slower rate of economic development to achieve "liberation".

Reliance on foreign expertise to set development objectives may lead to activities which are destructive of a society's essential supportive traditional institutions.1/ In the CADU Project in Ethiopia, for example, traditional ways were arbitrarily labelled as "backward" and "feudal". Yet, the truth is that the society concerned is in the best position to separate out those elements of culture which it considers essential from those it considers less important to its culture, and which therefore can be sacrificed for the sake of development. It follows therefore that every society should establish its own development objectives if it is to develop along lines acceptable to itself. This is as true for agricultural development as it is of the development of other sectors of the economy as a whole.

This does not mean that a foreign adviser from a developed country has no useful role to play in the setting of development objectives for an underdeveloped country. The setting of objectives involves the calculation of costs and benefits which not every society is able to make by itself. The well-trained foreign technician can often provide a society with the information it needs to assess the costs of achieving alternative objectives. If, therefore, a foreign adviser becomes sensitive to the constraints which culture imposes, he can perform a useful service and make a significant contribution toward helping an underdeveloped country make intelligent choices in setting its development objectives.

B. The Importance of Clear and Few Objectives

It seems obvious to say that a clear articulation of realizable objectives is an essential requirement for sound agricultural planning, but it is no simple matter to get an unambiguous statement of objectives. Because vagueness engenders confusion, objectives should be concrete rather than abstract. Thus, an objective for increasing rural incomes to a level specifically related to incomes in other sectors is preferable to one for increasing rural incomes to levels "not too far behind those in other sectors." (4, p. 106) Concreteness facilitates the setting of quantified targets. It also helps in the choice of appropriate means for realizing objectives.

Often political leaders are reluctant to commit themselves to objectives which impose political or economic costs on powerful interests (in which case clearly-enunciated objectives are seen as a threat); or political leaders may wish to satisfy every important

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1/ Since elites of less developed countries often absorb attitudes found in more developed countries to a point where their concepts are much like those of foreigners, advice given by them may have the same effect as the advice of foreigners.

group (in which case the objectives resemble public relations pronouncements rather than guideposts for setting targets and establishing plans for their achievement).

It is common to find agricultural plans with a long list of objectives. For example, the agricultural plans in El Salvador's Plan for 1965-69 set objectives for (a) increasing agricultural productivity; (b) increasing production of industrial raw materials; (c) diversifying production; (d) increasing employment; (e) improving distribution of income among the agricultural population; and (f) agrarian reform.1/ Besides the likely inclusion of mutually exclusive objectives (e.g., attempts to increase productivity in the Salvadorean Plan might conflict with attempts to increase employment), a long list of objectives is generally harder to achieve than a short one because of the scarcity of resources. Since the problem is more often one of too many objectives than the lack of them, one precept worth bearing in mind is the desirability of having as few objectives as possible and, ideally, only one.

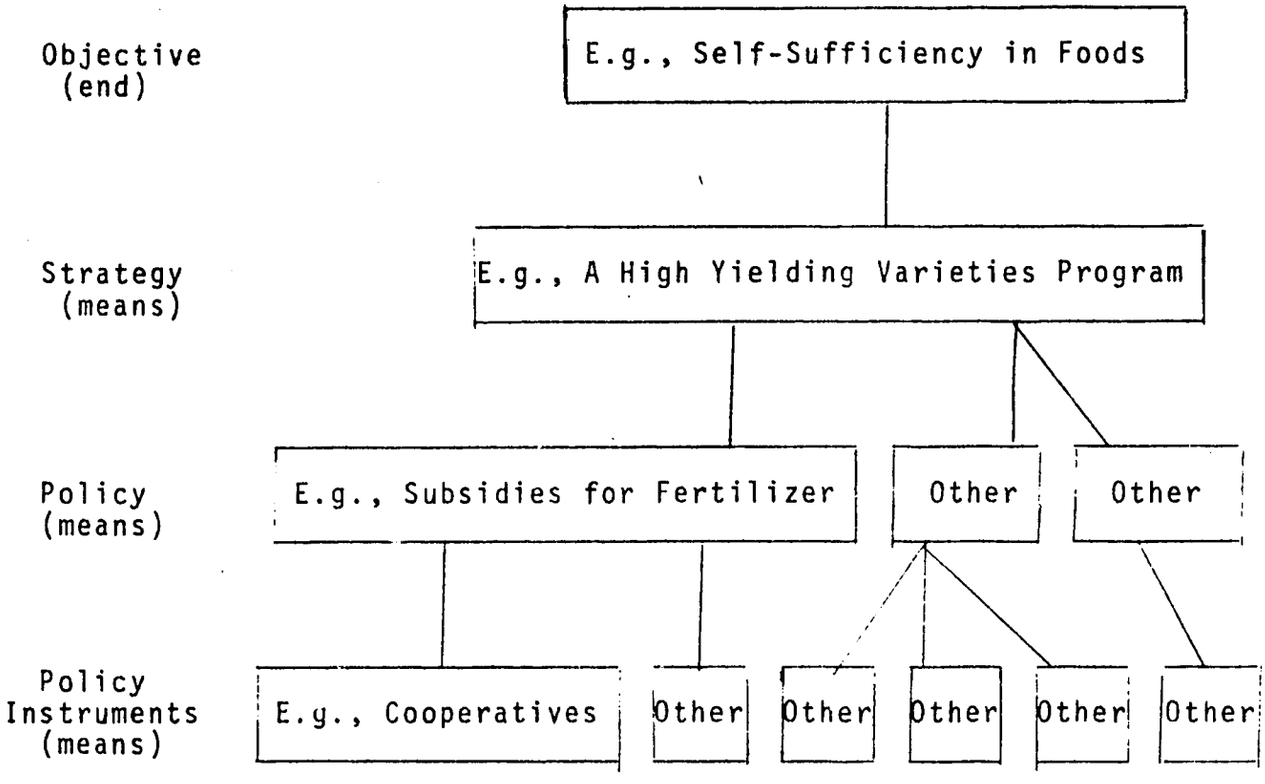
C. The Difference between Ends and Means

A related principle is that it is desirable to distinguish between objectives and means for their achievement. In particular, a strategy, a policy or a policy instrument should not be confused with an objective because this may lead to the substitution of the means for the end to be achieved. The end result sought is the objective; while the broad or general approach adopted to achieve the objective is the strategy; the guiding principle by which decisions are to be made to put the strategy into effect is the policy; and the measure adopted to carry out the policy is the policy instrument. For example, where achievement of self-sufficiency in food requirements is the objective, a high yielding varieties (HYV) program may be the strategy, the use of government subsidies for fertilizer may be the policy, and the sale of fertilizer by cooperatives to farmers at lower than market prices is the policy instrument. (Figure 1 shows the relationship between ends and means.)

1/ Bolivia's Plan for 1962-71; Afghanistan's Plan for 1967/68-1971/72; Ethiopia's Plan for 1962/63-1966/67; and Honduras' Plan for 1962-65 similarly had long lists of objectives for developing the agricultural sectors of their respective countries. A. Rubner (in The Economy of Israel) has listed the following often contradictory objectives used in agricultural planning: maximum levels of income for farmers, maximum caloric output, maximum foreign exchange earnings, maximum value of output per acre, maximum value of output per unit of water and maximum employment per unit of land (cited in 93, p. 111). To which may be added other contradictory objectives like the raising of farm incomes and the maintenance of low food prices for urban consumption or the subsidization of inefficient farmers and the achievement of greater efficiency.

FIGURE 1

ENDS AND MEANS



Hence the HYV program, the use of subsidies, or the use of cooperatives to sell the subsidized fertilizer should not be included as objectives because they are means for achieving self-sufficiency.1/ Thus, it was incorrect to say that one of Peru's "objectives for the agricultural sector: [was an] increase [in] the budget allocation to the Ministry of Agriculture, thereby improving the capabilities of this institution."2/ (94, p. 2) Similarly, it was a confusion of ends and means for the First Malaysia Plan to list as objectives increases in the number and quality of agricultural teachers, researchers and extension agents; intensification of agricultural research; stimulation of improved production practices; increases in acreage under cultivation; and improvements in agricultural institutions, when there were only means for achieving higher output, increased employment and higher agricultural incomes. (95, pp. 105-106) Turkey's First Five-Year Development Plan also furnishes an illustration of the confusion between ends and means, since it incorrectly identified more efficient use of land as a development objective. Efficient use of land is only a way of achieving development

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1/ This distinction between ends and means applies when both refer to the same level, e.g., the national level. However, what are means at one level may be an objective at another . Thus, in the example cited, the HYV program, which at the national level was the means for realizing the objectives of self-sufficiency, may be the objective at the regional level, while the use of government subsidies is the regional means for achieving that objective. Similarly, what are the means for achieving a government's plan objective may become the objective of one of its ministries, departments or agencies. For example, the HYV program, the means which the government employs to achieve its objective of self-sufficiency in foods, may be an objective for the ministry of agriculture; just as administration of government subsidies for fertilizer (which constitute the government's policy for carrying out the HYV program) may be the legitimate objective of the government agency in charge of that function. One writer has suggested that it might help clarify the difference between ends and means to identify development objectives as final, intermediate or immediate. For example, for a rural development program, improved income and welfare of rural producers may be the final objective, increased production of certain crops may be an intermediate objective to help achieve the final objective of increasing income, and the provision of inputs designed to increase output may be an immediate objective to achieve increased ouptput of the crops encompassed by the intermediate objective. However, as will be seen in the discussion of development strategies and policies, the distinction between ends and means is operationally more useful.

2/ Budgetary allocations are usually made as a matter of policy. When a specific decision is made under a general policy, e.g., when a budget allocation for a specified amount is made, it may be referred to as a "policy instrument".

objectives; it cannot be the end result to be achieved. (96, p. 129)

Although it may be proper to consider land reform a key policy in a strategy to increase rural employment and agricultural development opportunities, it should not be thought of an an objective of agricultural development, but a means of achieving that objective. Consequently, it should not be included among the objectives of an agricultural plan. This distinction is not a matter of semantic quibbling. Where land reform has been viewed as an objective rather than a means for achieving agricultural improvement, many of the complementary measures required to make the agrarian reform productive have frequently not been carried out. Land reform which doesn't take account of the need to build and maintain credit systems, marketing, supply and other supporting systems will not lead to much.1/ (97, p. 10)

Confusion between objectives and means makes for uncertainty. In Tanzania, for example, it has been unclear on occasion whether participation of the rural masses in planning and implementation is an objective or a means of increasing rural incomes. If rural mass participation is the objective, it might be achieved without realization of increased incomes, and vice versa. If both are objectives, the means used to achieve them would have to differ from the means used to achieve only one. Or, if rural development is an objective, it might be achieved by government construction of infrastructure and the provision of rural services; but if self-sustaining rural development is the objective, the means would have to provide for agricultural development to make it possible for local output and incomes (rather than government subsidies) to eventually support continuing rural development. Thus, clarity in defining objectives goes hand-in-hand with knowing what means to employ in realizing the objectives.

In the Kenya Special Rural Development Programme (SRDP), there was confusion between objectives and means. Increased local participating, improved project and program implementation, self-generation rural development, increased output and incomes, and reduced unemployment were all listed as objectives, when increased local participation and improved implementation were only means for achieving self-generating rural development, increased output and incomes, and reduced unemployment. In the SRDP, also, hazy distinctions

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1/ In India, the zamindari system in which the landlord (zamindar) shared little of the costs of production and risks of innovation, but heavily in the output, discouraged production. But removal of the zamindars has improved the environment for innovation. But the opportunity thus presented has not been acted upon -- which indicates that a favorable change in the land-tenure system is not a sufficient condition for inducing technological change. (49, p. 54)

between objectives and means, as well as vaguely defined objectives1/ led to unclear guidelines to local officials and to inadequate execution of the Programme.

D. Other Distinctions among Objectives

Social and political objectives, e.g., for improved distribution of agricultural incomes or raising the income levels of depressed areas, are sometimes included in agricultural programs. Since such objectives may reduce the rate at which output can otherwise increase, at least in the short run, it is essential that the political leadership indicate the extent to which it is willing to trade off growth of output and incomes to achieve social and political objectives.2/ Otherwise, it is difficult to select appropriate strategies and policies, and as a result, either the economic objectives or the social and political objectives may fail of achievement.

A distinction should be made between short- or medium-term objectives and long-term objectives. Prudence dictates that a realistic assessment be made of what can be accomplished in the short-run or medium-term on the basis of past history, available resources and the prevailing level of administrative competence; and what had best be left for the longer-run. In defining objectives, it is important to make short-term objectives concrete because they are the basis for operational targets, strategies and policies. Because long-term objectives are implemented only over an extended period, they may be broadly framed and indicate only the general directions in which the sector is to develop. (86, p. 61)

Structural change in agriculture usually takes many years to achieve, and many objectives for the sector are therefore long-term. Examples include objectives for a substantial increase in the efficiency

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1/ For example, it was unclear just where incomes were meant to be increased.

2/ It is possible for what are means in a long-term plan or planning period to be objectives in a short-term plan or planning period. For example, although land reform is a means for achieving agricultural development in the long run, in the short run it could be viewed as an objective. But the danger in dividing the planning period into segments when agricultural development (however defined) is the long-term objective is that that objective may be lost sight of. It is therefore important where agricultural development is the ultimate objective not to consider the means for achieving that objective as more than intermediate objectives. Insofar as the long-term is concerned, intermediate objectives must be seen as means which require additional measures to be taken to reach the long-term objective.

of production, a major shift from backward subsistence agriculture to modern commercial agriculture,1/ a considerable diversification of output, a great reduction in the proportion of the population dependent on agriculture, a major decline in agriculture's share in total output, or a change from rural diets heavily dependent on cereals to ones which rely mainly on protein foods like milk, meats, fish, eggs, vegetables and fruits.2/

Although a short- or medium-term objective for agriculture is frequently a necessary stage in the achievement of a long-term objective, it may be different from, and even opposed to, the long-term objective for the same variable. Employment of agricultural manpower is an example. In the short- or medium-term, especially in early stages of development, the objective may be to increase rural employment opportunities; but in the long run the objective is likely to be a reduction in the proportion of the population engaged in agriculture. (9, p. 56; 86, p. 61) Because long-term and short-term objectives may be mutually inconsistent, decisions may have to be made about whether the short-term objective is to prevail at the cost of the long-run objective, or whether the long-run objective is the more important. (4, p. 106)

E. Objectives and the Stage of Development

Agricultural objectives differ among countries, as well as in the same country in different periods. Since agriculture is the main economic activity in most less developed countries, agricultural objectives in these countries are usually similar to national objectives. (4, p. 103) Indeed, one may say that in these countries national objectives are agricultural objectives and agricultural objectives are national objectives. (8, p. 2) This differs greatly from the situation in developed countries. Because agriculture in these countries is usually responsible for a small part of total output and employment relative to other sectors of the economy, there is sometimes a great divergence between national and agricultural objectives. (4, p. 103)

In developed, mixed-economy countries, the major objective generally has been improvement of farmers' incomes by preventing output

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1/ E.g., as was envisaged in Ethiopia's 20-year agricultural program.

2/ 20, pp. 10-11. Improvement of nutritional standards, particularly through an increase in the consumption of animal protein often requires an increase in livestock production, increased per capita incomes, and the introduction of new nutritional habits through gradual education before better nutrition becomes widespread. (96, p. 129)

from increasing beyond what the market will absorb at prices which are considered remunerative for farmers.1/ (14, p. 558) This objective has been interpreted in Western Europe and the United States to mean that the gap between low-income levels in the agricultural sector and higher incomes in the industrial and service sectors must be reduced.2/ (40, p. 500) Where developed countries are large exporters of agricultural products, this objective has had to be balanced against the need to maintain competitive prices in international markets.3/

Since agriculture accounts for a large proportion of the national product of less developed countries, the maintenance of farmers' incomes at levels comparable to those in other sectors has been an objective which has thus far proved to be beyond the financial capacity of most of these countries. Indeed, with some exceptions, the agricultural sector in less developed countries has been the main source for financing industrial development, at least at first. (4, p. 106) Because few less developed countries produce enough food and fiber to meet even domestic requirements, the primary objective of these countries has been to increase agricultural production. This objective has been adopted for a variety of reasons, e.g., to increase exports, promote import substitution or improve nutrition. It has often been supplemented and qualified by other, often related, objectives, such as fuller utilization of under-employed rural manpower and diversification of production to improve the balance of payments position (e.g., in the Sudan, by producing rice, sugar and coffee as import substitutes; in Pakistan, by increasing output to obtain self-sufficiency in domestic food requirements; and in Jordan, by increased agricultural exports). (99, p. 247)

While there usually is a clearcut difference in the agricultural objectives of the developed and the less-developed countries, there are exceptions. Thus, in the U.S.S.R., as in Eastern Europe, the major objective has been, as in the less-developed countries, to increase output, especially of grain; (2, p. 116) while in the less-developed countries, the "green revolution" has raised the possibility that in at least some of these countries it may be necessary before

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1/ With the elimination of agricultural surpluses in 1973, this objective no longer is as important as it was before.

2/ However, the desire to make food available to domestic consumers at reasonable prices tends to limit the extent to which farm incomes can be increased through increased food prices. (98, p. 60)

3/ In the United States, domestic and foreign price problems have tended to be neutralized by government payments to producers. In 1972, the U.S. Department of Agriculture reported (Hatch, Roy E., Farm Index, December 1972) that such payments amounted to more than 20 per cent of total net farm income, i.e., over $4 billion compared with $18.8 billion in net farm income.

long to curtail, rather than expand, the output of wheat or rice (100, p. 20) where effective demand does not keep pace with the expansion of output. With regard to agricultural labor, objectives of less-developed countries usually reflect the fact that they are plagued with redundant agricultural labor; but Libya has found it difficult to retain a sufficient number of agricultural workers because of the expanding labor requirements of its oil industry. (2, p. 116) Ultimately, therefore, a country's agricultural objectives depend on its circumstances, as well as on the degree of its development.

Nevertheless, the stage of a country's development is still the most important determinant of agricultural development objectives. This appears to be as true for countries midway on the road to development as for those at either extreme. Thus, increased output for improving nutrition is usually an objective of countries at the midway stage of development rather than of countries at an early or late stage.1/ (4, p. 106)

Israel's objectives for agriculture appear to stand halfway between the developed and less-developed countries. Some of its agricultural objectives (e.g., growth of the national product, reduction in the trade gap, and balanced dispersal of the population) closely reflected national development objectives; while others (e.g., greater efficiency and productivity, improved levels of vocational and general education, and greater equality of incomes) are peculiar to agriculture rather than the economy as a whole. (101, p. 347)

1/ However, there are indications that improved nutrition may become an objective of less-developed countries.

VI. THE STOCKTAKING AND DIAGNOSTIC SURVEY

Effective agricultural planning requires knowledge about recent progress in agriculture, the existing situation in the sector (especially the main problems impeding development), and the potentialities for achieving agricultural objectives. This information is needed for re-assessing current investment and other development activities as well as for planning new development activities and setting benchmarks against which to measure progress toward the achievement of objectives. Improvement in the way activities are being carried out can make as great a contribution to development as the start of new activities. (102, p. 180) Analysis of recent and current conditions also may reveal structural and institutional relationships or policies affecting agriculture which have to be modified if agricultural development is to accelerate.

Thus, knowledge of the recent past and the present is essential for defining the nature of the planning task and its limits. A stocktaking and diagnostic survey, carried out early in the planning process, is a desirable way of providing the required information.

A stocktaking and diagnostic survey should be distinguished from a basic research study for agriculture or one of its subsectors, or from a program for a series of such studies. Although short-term research and a few fact-finding, ad hoc studies involving small sample populations which can be completed quickly are not necessarily to be excluded, a stocktaking and diagnostic survey of an agricultural sector or a subsector should be, as its name implies, a broad-gauge inventory, and assessment of largely existing information about the sector or subsector.

A stocktaking and diagnostic survey is also to be distinguished from an agricultural plan. The purpose of the survey is to prepare, collect and classify pertinent information needed to formulate an agricultural plan. The process by which a plan for agriculture is prepared may therefore be seen as consisting of two main steps: First, the stocktaking and diagnostic survey and, second, its conversion into an ongoing plan in the light of objectives set for the agricultural sector. Since the provision of information for preparing an agricultural plan is therefore the justification for the stocktaking and diagnostic survey, the duration of the survey should be determined by the requirement for completing the formulation of the agricultural plan by a given date. In general, the survey should take no more than six months. The formulation of the agricultural plan,

i.e., the second part of the two-part procedure, usually takes longer, perhaps a year or more.1/

Information is never available in sufficient quantity and quality to meet all planning requirements, and the accumulation of data required for planning purposes is a never-ending task. Hence, those responsible for the stocktaking and diagnostic survey must resist the temptation to produce new data which take much time to obtain. Instead, they should concentrate on the collection, analysis and projection of available data. At the same time, they must note the informational gaps which require longer-term research and study so that provision may be made to fill the gaps with a program of basic sector and sub-sector pre-investment and other research studies which may require years to complete. These studies constitute a separate matter which will be discussed later when the seventh component of an agricultural plan is considered. The concern here is only with the stocktaking and diagnostic survey.

Since the main purpose of a stocktaking and diagnostic survey is to provide information within a short time for the preparation and implementation of an agricultural plan with specific objectives, it is essential that the survey be activity-oriented, i.e., directed toward the provision of concrete information required to formulate a plan for achieving these objectives.2/ Thus, the data collected, the way they are arranged and analyzed, and the choice of issues examined must be dictated by the plan's objectives. It must be understood that the stocktaking and diagnostic survey is not intended to be a means for accumulating and anaylzing all available facts about the agricultural sector. What matters most is not the quantity of data obtained but its relevance. Consequently, proper conduct of a stocktaking and diagnostic survey requires considerable discrimination in the selection and rejection of data to be acquired.

1/ One specialist suggests that "the drafting of a well-considered agricultural program is likely to take at least 2 years...." (14, p. 569; 11, p. 183)

2/ As has already been noted in the discussion of the classification systems for agriculture, and as will be noted again hereafter, data collection and arrangement can be carried out in a manner which will facilitate or frustrate the preparation of a plan with specific objectives. If, for example, a plan's objective is to bring about a more even distribution of producer incomes and the data collected are arranged in a manner which facilitates comparisons or projections of commodity increases rather than output and incomes by farm unit, preparation of an effective plan whose objective is more even distribution is made difficult or impossible. Since most data are arranged with an eye to growth, this problem can be a serious impediment to the preparation of plans which give high priority to objectives other than growth.

The foregoing implies that the scope of a survey should be limited, not all-embracing; and that the survey report should be thematic rather than discursive. It implies also that the information in the survey report must be pointed and relevant, not merely of general interest; sufficiently detailed to be useful, but not so detailed that the report is too bulky for easy use as a reference.1/

A good way to begin the stocktaking and diagnostic survey is to outline the scope and emphasis of the survey, as well as the subsectors to be covered. As far as possible, the survey should provide separate information for each of the major regions in the country. An early task in the survey period is the collection of all previous studies (and plans) of the agricultural sector, as well as all available indexes of aerial photographs, and topographic and other relevant maps, for examination, comparison and analysis.2/

In many countries, there are surprisingly good opportunities to obtain regional or local plans, statistics, maps and other useful material from district and other area offices. Those conducting the survey should therefore arrange to visit these offices. (62, p. 82f) It is also desirable, as soon as possible, to determine the subjects for which short-term field investigations will be required. This is not alway easy to do early, unless gaps in information are known in advance or become evident soon after

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1/ Appendices and annexes are convenient means for including statistics and other information which are considered important but outside the scope of the main themes being developed in the survey report. To avoid overburdening even the appendices and annexes with information only peripherally related to the main themes in the report, one appendix or annex may list the peripheral or other data not included in the appendices and annexes and where they may be found. Computer programs have been proposed or attempted for the management of data. Where much data are involved, computer facilities make retrieval of such data easier. With good programming, computers can handle complex inter-relationships among data. One method of portraying resource data visually is explained in 103.

2/ Some countries have amassed a considerable amount of data ard materials which can provide much useful information. For example, under the auspices of the Organization of American States, each Latin American country now has available an Annotated Index of Aerial Photographic Coverage and Mapping of Topography and Natural Resources, which shows the specific areas in each country which have been surveyed. The Index provides information on all geologic, soils, forestry, ecological and land capability mapping, as well as the standard topographic and aerial photo coverage.

the survey begins. But the later such studies start, the smaller the chances that they will be completed in time for use in preparation of the program. Finally, it is important at the start to set up a timetable with deadlines for each phase of the survey and to check progress at regular intervals against the timetable. By "planning the planning" in this way, it is easier than it otherwise would be to take appropriate remedial action quickly when work lags.

A stocktaking and diagnostic survey encompasses a broad range of subjects which may be grouped in different ways. Although these subjects may be divided into separate classes for better understanding, the subjects are not really discrete. Proper analysis of the agricultural sector requires that agriculture is seen as a system of functionally inter-related and inter-dependent elements, each of which contributes to the existing and potential level of performance of the sector. Thus, the survey should combine its parts in a form which constitutes an integrated whole in which information, analysis and projections complement each other. What has been said about classification of the data therefore also applies to the sequence followed in their collection and analysis. While it is sensible to assemble and analyze information included in a survey in accordance with some logical sequence, it is unnecessary and unfeasible to establish one sequence for general use. With these caveats in mind, the following six-fold classification and sequence for a stocktaking and diagnostic survey is proposed as one possibility:

(1) Basic Data
(2) Inventory of Agricultural Resources
(3) Agriculture's Role in the Economy
(4) Present State and Potentialities of Agriculture
(5) Supply and Demand Projections
(6) Informational Gaps

A. Basic Data

An early task in the conduct of a stocktaking and diagnostic survey is the collection of the available relevant data about agriculture. Such information is needed not only for the preparation of a plan for agricultural development, but for exposing gaps and weak points in the data. This means that collection of statistics is not enough. It is essential, of course, to have quantitative data, say, of the different kinds of livestock; for the production, distribution and consumption of agricultural products;1/ the amount of fertilizer and other inputs used; the prices

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1/ The production data should give as much up-to-date information as possible about agricultural production. with the area planted with each main crop and average yields; where each crop is distributed (whether domestically or exported); and where it is consumed.

farmers receive for their products and pay for their equipment, supplies, labor and use of capital, the taxes they pay, and so forth. But, it is equally important to evaluate the reliability of the statistics.

This often requires an examination of the way the data were collected as well as their timeliness, coverage, comparability and accuracy. If data are found to be defective, the extent to which they are usable or perfectable should be noted. (104, pp. 2-5)

The kind of data required for planning will depend on the way the plan is to be formulated. If the agricultural plan is to be an aggregative one in the first instance and disaggregated subsequently, the data required will differ substantially from what will be needed if the aggregative plan will be, in essence, the sum total of individual regional, subregional and local plans prepared within each of these territorial areas in the first instance. Since, as has already been indicated, good planning for agriculture must include planning "from the bottom up," detailed local, subregional and regional data will be needed for the formulation and implementation of subnational plans. If information about farmers' priorities, primary objectives, attitudes and beliefs are to be considered; and if those of traders, middlemen, processors and others in the private sector concerned with agriculture are to be taken into account in formulating the plan, data from other than official sources will have to be collected in the field. And if policy and administrative practice are to conform to the planning process "from the bottom up," the information collected must be collated and organized with this in mind. Effective agricultural planning must begin, therefore, with a proper appreciation of the fact that data are to be collected, collated and organized in ways which lend themselves to the formulation of local, subregional and regional plans.

Implicit in "planning from the bottom up," is the need to [illegible]tual farm data in each area for which a plan is to be pre- [illegible]he relationship between inputs and output. In most [illegible]eloped countries, calculations of required inputs and [illegible] effects on output are based on data from a few experimental farms for which national or regional averages are calculated. Not only may these calculations never have been accurate for individual farms in some regions, subregions and localities in a country; they may have been made so long ago that they are no longer suited as yardsticks in areas in which they may have been appropriate originally. (73, pp. 582-583) Where agencies for the collection and arrangement of the necessary data exist, reorganization and administrative reshaping may be required; where they do not exist, the need for creating organizations suited to the collection and arrangement of local, subregional and regional data will have to be provided for when the inventory of institutional resources is made (see Item B, 3, p. 199). (73, p. 582)

With these caveats in mind, the basic data should include information on the production of major crops; the areas cultivated in each major crop; yields per unit of area, areas sown but not harvested; fallow areas; double-cropped irrigated areas; and inter-cropped areas. Estimates should be made of final demand for each major crop, including consumption on farms. The statistics also should include the trade in major agricultural commodities and the extent to which exports and imports are involved. The data should also include information on the size, character, technology and organization of farms, by groups.

B. Inventory of Agricultural Resources

Closely related to the collection and analysis of basic data, and in some respects an extension of that aspect of the stock-taking and diagnostic survey, is (a) the taking of an inventory of currently used and potentially available resources for agricultural production and (b) an evaluation of the quantity and quality of these resources for increasing production in each major region of the country. The extent to which agricultural development is possible ultimately depends on the amount and nature of available resources. To get the most from the planning effort therefore requires knowledge of the productive resources available and their potentialities for expanding output.

Some resources available for agricultural development may be unknown. One purpose of an inventory is to reduce the area of the unknown. An inventory of resources can also reveal points of areas which might repay further investigation, even when resources are not available for immediate use, e.g., the possibility of increasing the amount of water for irrigation.1/ (105, p. 82) Another purpose of an inventory is to discover which resources are partially or ineffectively employed. Still another purpose is to distinguish between resources which are relatively scarce, and hence should be used to the utmost.2/ (11, p. 183) Common to

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1/ Thus, surveys have revealed that Senegal has supplies of ground water which can be used to increase agricultural output in the dry regions of Northern Senegal. However, it also appears that little has thus far been done to exploit the possibilities of tapping the ground water which may be available for agriculture.

2/ In all economies, one or more factors are scarce. The way in which land, labor, capital and water are combined to best advantage will depend on the factor(s) in shortest supply. At the start it is therefore important to identify the factor(s) which, because of scarcity, limit(s) output and to utilize it (them) first to satisfy the need for producing the most profitable or desirable product(s). The remainder of the limiting factor(s) may then be combined with the other factors to produce less profitable or otherwise less desirable products, in order of their real profitability or desirability to the national economy. (105, p. 178)

all these purposes is the need to learn enough about the available productive resources for agriculture to allow the national effort to be concentrated on those which are most important for achieving development objectives.

The inventory and its appraisal should cover the (a) natural, (b) capital, (c) institutional resources and (d) manpower currently and potentially available for the production and distribution of agricultural commodities. In estimating future resources, foreseeable changes in quality are as important as changes in quantity.1/

1. Natural Resources

It almost goes without saying that the preparation of an agricultural plan can be greatly facilitated when there is an inventory of all land available for agriculture. For each major region of the country, the inventory should include information on the physical features (topography, geology, soils, natural vegetation, and hydrology -- both surface and subsurface -- 2/ which determine the land's capability for agricultural development. The inventory should compare the potential uses of land in each major region with the way it is actually employed, making special note where the land is underutilized or poorly utilized.3/ Since the comparison of actual land use with land capability can provide key information leading to the identification of agricultural projects, it is important that the comparison be made with this in mind.

In classifying the principal uses to which agriculture is or may be put, distinctions should be made among cropland,

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1/ For example, in the initial phase of plan preparation in Israel, planners noted that (a) only a slight increase in the total supply of water for agriculture, which is a scarce resource, could be expected in the program period and (b) the quality of the water would deteriorate in some regions because water with a higher mineral content than before would have to be used. (40, p. 507)

2/ The information on water resources should provide data on the availability, distribution, dependability of supply, and uses to which irrigation water is put, as well as possibilities for increasing water resources. If the supply is inadequate, estimates of demand should be made; if supplies are underutilized, this should be noted, together with the reasons which account for underutilization.

3/ For example, if a land area is producing one crop a year where two or three crops are possible, or if land which is suitable for growing high-yield agricultural crops is being used to graze cattle, this should be noted.

pasture, forests, wasteland, or other uses in terms of acres, hectares or other appropriate unit of measurement, as well as in terms of farm units. Wherever possible, statistics should be supplemented with maps which facilitate reference to differences in physical land characteristics, as well as differences in meteorological, climatological, hydrological, geologic and geomorphic conditions. The inventory should also relate land capability to other pertinent factors, including population densities, types of land tenure systems used, proximity to markets and urban centers, as well as available transportation and other infrastructure.1/

1/ Until now, most physical data have been collected by aerial photographic or ground surveys. Now, a breakthrough in data collection appears to be in the offing. The Earth Resources Technology Satellite (ERTS-I), launched July, 1972, promises to be a significant improvement over present methods of collecting physical data. A second satellite is scheduled to go aloft in 1976. Through photographic maps, ERTS provides an inventory and monitoring of the earth's resources, the details of which far exceed the capabilities of aerial photographic or ground surveys. The advantages of ERTS are its cost-effectiveness and scope of coverage. In one day, ERTS can scan over 6 1/2 million square kilometers and produce about 1,350 photographic images. Moreover, with a near-polar orbit about 912 kilometers up in space, which is sun-synchronized, ERTS can photograph any given location on earth at the same time of day on consecutive days over an extended period. This permits a recording of seasonal changes to a degree not possible before. During the first seven months of orbit, ERTS-1 completed sixteen 18-day cycles of the earth, covering about 75% of the world's land area.

ERTS has been particularly accurate in crop and vegetation identification, timber and range resource surveys, and the construction of soil association maps. With an accuracy level of 70-90%, it has been able to identify corn, soybean, popcorn, winter wheat, rice, safflour, asparagus and cotton. It has been able to detect field conditions for areas as small as 10 acres. With ERTS photography, it took only 10 man hours to delineate 7 vegetation types from a color composite of the Seward Peninsula in Alaska where only four types were known before.

ERTS makes it possible to map remote and previously inaccessible terrain, record villages and cities, fields, forests and wastelands, distinguish among crops, separate healthy from unhealthy crops, locate geological faults and other features. The data ERTS makes available through satellite photography surpass aerial and ground surveys in providing information on land use, land classification, and natural and other resources. However, data from a satellite survey are expected to be complementary to traditional surveys since

Where a country's objectives for agriculture emphasize increased output, it may help to divide all land available for agriculture within each farming area in accordance with its potential to increase output. For example, the inventory can divide all the available agricultural land, as one agricultural authority has suggested, into the following three classes: (a) areas of immediate growth potential; (b) areas of future growth potential; and (c) areas of low growth potential. (107, pp. 21-22)1/

(a) Areas of immediate growth potential would include those where climate, soil and water conditions are favorable for agriculture and where technology needed to substantially increase output of at least one major crop already being grown is available. To the extent that problems existed which could impede substantial increases in output, they would have to be capable of resolution within a short period, say, one year.

(b) Areas of future growth potential would include those with favorable climatic and soil conditions which lack one or more of three elements essential for an area of immediate growth potential. The first of these elements would be an adequate and controlled supply of water; the second would be the technology required for substantially increasing production of a major crop or crops currently grown or capable of being grown; and the third

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ERTS data could indicate where more intensive ground or aircraft surveys will be useful. Satellite photography offers particularly great advantages to the less developed countries because these countries are generally poorly mapped and in great need of resources surveys. Although the ERTS program is considered experimental, less developed countries are already participating in the program. For example, Bangladesh, Bolivia and Brazil have programs for land use, hydrologic and resource inventory surveys to be carried out by satellite. (106, pp. 9-15)

1/ Areas of differing growth potential are likely to be found within the same district. For example, even if the same major crops are grown in all parts of a district, some land in the district may be irrigated or require drainage, while other land may not; different cropping patterns may prevail in different parts of the district; etc. As a result, a district may combine areas of immediate, future and low growth potential, or only two of these. (108, p. 98)

would be the transportation needed to tie the area(s) into the national economy. Lands which would otherwise be considered areas of immediate growth potential would have to be classified as areas of future growth potential if the missing element(s) could not be provided in a short time, which might be defined for illustrative purposes as three years.

(c) Areas of low growth potential would include those with climatological, soil, topological or other deficiencies without economic means for correcting them. Frequently, such areas have too little or too much rainfall, or rainfall at the wrong time; and have subsistence farms over a large part of their territory. For such areas, only major technological breakthroughs, not foreseeable at the time the inventory is taken, are required before substantial increases in output are possible. (107, pp. 21-22)

As indicated, the three-fold classification just described is appropriate if the objective is to increase all agricultural output. Frequently, however, plan objectives call for increases in the output of a specific crop. For example, in the early 1960's the Plan for East Pakistan (now Bangladesh) called for increases in rice production to make the Region self-sufficient in this cereal. In this case, the available lands would have to be classified in accordance with their potential for producing rice.1/ But if land were divided without reference to a single crop, greater variations would be possible, even in so homogeneous a country as Bangladesh.2/

If the plan objective is other than increased output, an attempt should be made to classify the available land areas accordingly. For example, in Tanzania, where the plan emphasizes the ujaama village, the land area might be classified in accordance with the potental for furthering the ujaama concept through (1) villages which are likely to be especially amenable to organization into ujaama units because they were settled with

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1/ Of course, there is nothing sacrosanct about the three-fold division. A two-fold, four-fold or other division is possible. In the case of Bangladesh, where land conditions are more uniform than in most other countries, the classification might have been based on the number of rice crops obtainable in different lands each year and the extent to which areas suitable for rice production were subject to floods and other natural hazards which might impair their ability to produce.

2/ For example, land could be classified on the basis of whether food grains or cash crops were dominant. The tea plantations in Sylhet and Chittagong Hill Tracts might make a natural region. Regions could also be classified according to the amount of sugar cane and jute produced, etc.

this purpose in mind by government intervention; (2) village units which might be somewhat harder to organize because they were spontaneously settled by those who live there who were not especially oriented to the ujaama deal; and (3) villages which would be hardest to change into ujaama villages because they were engaged in commercial agriculture, especially of perennial crops.

This kind of land classification differs from that for assessing the potentialities for increased output in that it refers more to the likely attitudes of producers than to the characteristics of the land on which they are located. However, if the potentialities for achieving agricultural objectives other than increased output can be related to specific land areas, classification of available agricultural lands would be useful. This would also be true if a plan's objectives called for raising the income of producers in, say, the lowest 20% of a country's income level, provided that these producers were largely located in clearly-defined depressed regions. But if the poorer farmers tended to be dispersed in many areas among the more well-to-do farmers, there would be little value in classifying land area in accordance with its potentiality to achieve plan objectives. Instead, it would be better to classify producers in the various areas in accordance with the level of income, size of farm worked, farmers' relationship to the land (renters, squatters, owners, etc.), the kinds of crops produced, and the marketing system employed. Thus, for Mexico, where poor and rich areas tend to be separated, a classification of land in accordance with its potentiality for achieving plan objectives (whether for growth output or for objectives other than growth), is likely to be useful; in contrast, in India where poverty is endemic, a division of land area is likely to do little to help shape policy for dealing with the problem. Here, it would be better to classify producers in each region, subregion or locality in accordance with their levels of income, size of farm, crops grown, and so on.

An Indian writer has proposed a division of a country's land area which could be used whether or not the plan objective was to increase output. Scarce resources would be concentrated in a few selected districts or regions which would constitute a first "tier" of regions where a policy of intensive agricultural development would prevail. Since it would be difficult for political or social reasons to ignore the districts or regions which, where excluded from the tier as well as undesirable from the point of view of a country's long-term development, a second tier composed of the remaining districts and regions would be constituted where a policy of extensive agricultural development could prevail. The first tier would comprise those few districts or regions which could serve as "pathfinders" and "pace-setters" where the most intensive effort was exerted and "where the latest lessons of science and technology...(would be) tried out by the best available personnel and with all the investment needed so as to achieve a breakthrough." For each district or region in

this tier a special package of practices and works would be provided in the light of its special needs and with the aim of producing the best possible results. In the second tier, with all the other districts or regions of the country, the development effort would be relatively thinly spread with resources left over after providing adequately for the first tier. However, the second tier districts or regions would eventually benefit from this approach since there would be a gradual movement over time to the first tier. (109, pp. 9-11)

Without division of the available agricultural land areas (or producers, where this is indicated), into some such grouping as those described, resource allocations are likely to be uninformed about the requirements of different agricultural areas or groups. For example, when land has been classified into the three classes mentioned according to its growth potential for a specific crop whose output the plan is attempting to stimulate, it becomes possible to allocate financial and other resources in a way calculated to (a) maximize output from areas of immediate growth potential, (b) insure the soonest possible conversion of areas of future growth potential to areas of immediate growth potential, and (c) maintain the socially minimal status of areas of low growth potential.1/

Even where political or social considerations dictate that a central government provide all administrative areas in the country with an equal amount of resources for agricultural development regardless of their growth potential, the classification of agricultural land according to growth potential, where growth is the plan objective, allows resources to be used most effectively. Thus, for areas of immediate growth potential, it might be best (if farmers agreed) to concentrate scarce resources on increasing output and postpone expansion of community facilities beyond the essential minimum until increased incomes provide a surplus for this purpose; while for areas of low growth potential, it probably would be sound to spend most of the available resources for useful community facilities because the prospect for increasing output is poor; and for areas of future growth potential, it is likely to be best to divide resources between projects (a) required to transform the area into one of immediate growth potential and, since the results from these investments will take time to yield returns, (b) for community facilities, which have higher visibility and are likely to yield returns in the short-term. (46, p. 55; 379; 397)

1/ In a hypothetical instance this might be accomplished by allocating, say, 15% of available resources to areas of low growth potential after investigation showed this to be the amount required to maintain minimum levels of welfare considered desirable; and dividing the remaining 85% of the resources between areas of future and immediate growth potential in a way calculated to maximize output during a desired period.

2. Capital Resources

The inventory should describe and analyze capital investments in agriculture, as well as annual increases in the value of long-term improvements in each major region. Investments should be divided into categories which distinguish among buildings, water systems, irrigation works, drainage systems, fences, fruits or other trees, etc. The value and kinds of machinery and equipment used in agriculture should be classified by kind, e.g., tractors, tillage and harvest machinery, hand tools, trucks and automobiles. The number and value of work animals and breeding stock should be included among capital investments, and estimates should be made of the circulating capital invested in such items as seed, fertilizer, spray materials, feed and the like. (104, p. 99)

The main private and public sources of financing agricultural investment and working capital should be discussed. The extent to which farmers finance their own capital investments should be examined and the reasons for the prevailing level of self-financing should be given. For example, if incentives play a role in increasing self-financing of if administrative regulations or other legal requirements tend to reduce the level of self-financing, the effects should be outlined. If investment or working capital constitutes a constraint on development, the nature and the extent of the constraint need to be explained.

3. Institutional Resources

It is important to include in the inventory detailed accounts and evaluations of the national, regional and local institutions connected with agriculture, including those concerned with research; extension work; training; the provision of short-, medium- and long-term credit; marketing; and development. The nature, scope and method of operations of each of these institutions, and whether they are national, regional, public, private or mixed organizations should be described. The account should include an estimate of the ability of each important institution to perform the tasks assigned to it and to expand its activities.1/

The organization and role of the most important government ministries and departments concerned with agriculture should also be assessed. (104, pp. 67-68) In many countries, the ministry

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1/ Institutional deficiencies should be noted. For example, an extension service may not be able to help farmers much if it does not have enough agents; an experiment station may be engaged in research unrelated to farmers' needs; and an agricultural educational institution may be using outdated curricula. (104, p. 2)

or agency most concerned has failed to prepare, implement and manage effective agricultural development programs. In some of these countries, other government and private entities, including marketing boards, commercial and public banks, suppliers of agricultural inputs, cooperatives, farmers associations and groups (both national and regional or local), processors of agricultural products, and importers and exporters have performed some of these functions. The inventory should describe the organization and operations of the most important of these entities in detail and evaluate their effectiveness.

4. Human Resources

Size, composition, distribution and changes in the agricultural labor force should be estimated by major regions in the inventory and related to demand. Labor force estimates should show the composition (e.g., the number of owner-farmers, sharecroppers, and wage workers), and the number of the labor force employed, underemployed and unemployed, as well as seasonal variations. Trends in the composition and distribution of the agricultural labor force should be estimated, as well as internal migration (among rural communities and to urban areas), as well as external migration. The level of illiteracy and education, as well as the levels of nutrition of the agricultural population should be noted, especially if there is reason to believe that nutritional intake levels are below levels required to obtain increased productivity and output. Indeed, the inventory of human resources should be keyed to reveal the extent to which the human factor acts as a constraint on, and can contribute to, expanded output.

Estimates should also be made of the number of technicians available for research, extension and administration of agricultural projects and programs. Present employment of technically-trained personnel should be noted, as well as the fields in which shortages of such personnel exist or are likely to appear. For this purpose it may be useful to estimate the number of different kinds of technicians required for minimal or optimal results. The numbers needed will vary according to the situation. For example, the ratio of extension workers to farmers will depend on such factors as farmers' level of education, farming conditions, the road network, the quality of the extension workers and the techniques they use, as well as the financial resources and organization for extension services. (110, p. 173)

C. Agriculture's Role in the Economy

The collected basic data related to agriculture and the inventory of resources will facilitate analysis of agriculture's role in the economy, which constitutes the third element in a stocktaking and diagnostic survey. An analysis of agriculture's economic role is essential since planners must first know what is happening now before they can project and plan agriculture's future role in the economy.

If the agricultural plan is to be for a region, the part played by agriculture in the region and in the nation should be analyzed; if the plan is for a nation, agriculture's role in the national economy and in the major-producing regions should be analyzed. Besides the present role of agriculture, the analysis should cover a period in the recent past, the length of which should be determined by the extent and timing of changes in agriculture's role in the economy. The rate of growth in agriculture, both on an aggregative and per capita basis, should be compared with the rate of growth in other sectors and of the economy as a whole. Agriculture's contribution to national investment and the net value of agricultural production should be compared with investment and net output in other functional sectors, as a portion of the gross national or domestic product;1/ and agriculture's share in the country's foreign trade should be noted, as should structural changes, i.e., shifts in the relative importance of regions, classes of producers, commodity groups, and so forth. (111, p. 103) The number of persons in the rural population, the numbers dependent on agriculture (if this differs from the rural population) and the agricultural labor force should be compared with the urban population, total population and the total labor force (in the region and/or the nation), respectively; and the level of income in agriculture should be compared with those in other economic sectors.

D. Present State and Potentialities of Agriculture

In addition to the natural, capital, institutional and human endowments of the agricultural sector, the degree of development attained in the sector, in each major region of the country, can provide important indications of desirable directions for future development. Unlike industry, where planning can sometimes start from scratch, agricultural planning is always conditioned *a priori* by an existing production system with certain capacities and resources. (113, pp. 11-12) Part of the stock-taking and diagnostic survey should therefore include a determination of the existing capacities and resources of the sector, and its regional distribution and utilization; a descriptive analysis of how the agricultural sector functions in the various regions; the nature of the major production and distribution problems encountered;2/ and the opportunities available for meeting

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1/ Cf. 111, pp. 104-5, for a discussion of the problems inherent in efforts to segregate the net contribution of a single sector in an interdependent economy.

2/ It is important to provide sufficient detail about the major problems to permit effective remedies to be taken. Thus, a survey undertaken in Turkey made it apparent that many irrigation problems could be solved with laws regulating water rights and the use of pastures. (96, p. 118)

plan objectives. If an agricultural plan has been in effect, the results obtained should be appraised critically to identify the crucial factors which made important contributions to agricultural development and which limited progress. If output appears to be much lower than the possibilities, an attempt should be made to assess the relative roles of production practices, the utilization of resources, the activities of agricultural enterprises, etc., in curbing output. Where growth is an objective, it is helpful to make a preliminary estimate of the production potential of the most important commodities, based on known yields if modern production methods and alternative land uses were employed.

The analysis should include an estimation of the quantity, and an evaluation of, inputs and the level of prevailing technology to produce outputs (e.g., the use of fertilizers, machinery and other production aids), as well as farm practices, including cropping and other production systems, yields per hectare for important crops in the major regions, etc. The extent to which the current pattern of land use conforms to the use capability of the available land also should be discussed. (112, p.4)

Attention should also be given to current production practices, including the availability of, and access to, resources; the way resources are utilized; (48, p. 2) the level of labor productivity and the extent to which it is due to favorable or unfavorable resource endowments (e.g., man-land ratios), investment or underinvestment in technology or human capital, or a combination of these factors; the extent to which farmers tend to react to technological innovation; the way price, credit, land and other policies affect production; the existence and operation of domestic and external markets for agricultural products and the potentialities for their improvement and expansion;1/ the factors influencing farmers' incomes, and the way in which incomes are distributed among and within the various groups (e.g., landowners, tenants and laborers) contributing to agricultural production, as well as the reasons for the distribution pattern.2/

1/ For example, in South Korea, analysis of agricultural conditions and possibilities revealed that while many products could not compete internationally, on the basis of price, design or other standards, other products could. This led to the adoption of incentives and institutional supports which encouraged exports of the competitive products. (114, p. 4)

2/ The data should include information on income per capita, income per active person in agriculture, income per farm or income per family, as well as physical output per person, farm and family. (115, p. 78)

Variations in the agricultural system should be described and analyzed. For example, the agricultural system in an underdeveloped country may differ markedly for domestic, in contrast to export, crops; for small, in contrast to larger, farmers; for traditional, in contrast to non-traditional, crops; or for crops, in contrast to livestock. The terms of trade between agricultural and non-agricultural commodities; between agricultural commodities and means of production; and between production for domestic consumption and exports, should be discussed. (115, p. 78)

Attention should be given to major bottlenecks and other important problems which limit efficient agricultural production.1/ Since marketing inefficiencies often play a crucial role in constraining growth in production, the way the marketing system functions should be examined with special care. Consideration should also be given to the relative importance of demand and supply factors for determining future growth of the sector, including the question of whether growth is inhibited by limited output or inadequate demand. If there is much urban migration thought should be given to how increased urban demand can be met through commercial channels from domestic production; and if there are technical or economic impediments to this, how they might be mitigated or eliminated.

While some resources, like climate, must be taken as given, others like the amount of water available for irrigation, can vary over time. Feasible alternatives for developing the agricultural sector through increasing the resource base or otherwise, should be explored. Possibilities for using water more efficiently, raising labor productivity and increasing yields by the introduction of new techniques or otherwise should be evaluated. The relative merits of diversification, improvement and expansion of traditional exports, and production for import substitution should be assessed, including the probable effort and cost required for each proposed alternative. As already indicated, it is desirable to classify possibilities for removing constraints and improving potentialities under three headings: (1) those about which something can be done in the short-term; (2) those which require a longer period before change can be expected to occur; and (3) those about which little can be done in the foreseeable future.

For the purposes of development, it is also important to understand farmers' attitudes toward change and innovation.2/ Answers are needed to questions which cast light on farmers'

1/ For example, in Guyana, the low rate at which the agricultural sector had been growing was found to be due to high production costs, low yields per unit of land, small size of holdings, poor services and inadequate institutional arrangements.

2/ If the poorest farmers have a different attitude than the richer ones, a distinction should be made between the attitudes of the two groups.

attitudes. For example, do producers appear to respond to: economic incentives? noneconomic incentives? approval of authority and, if so, is the authority a public official or private individual (traditional or other kinds of "opinion leader")? Or do the producers' responses reveal a desire for status or prestige? Do producers respond to appeals to religious motivation, or the "better" ways of long ago? Do they have pride in family or village? Are tribal loyalties strong? What kinds of stimuli for producing change are likely to be ineffective or, even worse, do more harm than good? Is agricultural change best introduced by one or two leading farmers or by a group (e.g., the tribe or village)?

Efforts should be made to learn from past experience. But it should be borne in mind that what works well for stimulating needed agricultural change in one country, region, subregion or locality may not in another; what works well in the short-run may not in the long-run; and what works well as long as outside technicians are present may prove to be ephemeral when they leave, even temporarily.

The survey should therefore describe and evaluate successful and unsuccessful past attempts to introduce changes in agricultural and related practices in the areas of the country covered by the survey. The description of the salient features of each attempt and its assessment should be developed in sufficient detail to provide a firm basis for conclusions (to be included in the survey) concerning the best ways of stimulating desirable changes in production, marketing and other practices in the agricultural communities concerned. Successful past attempts to introduce change should be evaluated to determine the likelihood that they could be repeated in other areas of the country. On the basis of past experience, the assessment should also indicate which existing social forms in each area are likely to support innovation and which are likely to undermine it. There are times when innovation has a better chance of being accepted than at other times. Farmers will accept at one time what they will not accept at another time. The assessment should therefore include suggestions concerning what is likely to be the best timing for attempts to introduce innovations.1/ (90)

1/ Since the "right time" might refer to the time of the year (e.g., when farmers are likely to have the time and money to try something new) as well as the longer term, the assessment should consider this aspect as well. For example, the best time of the year to try to introduce an improved variety of seed is when the farmer is likely to be planning his next planting; the worst time would probably be just after the farmer has planted the traditional seeds he has always used.

Efforts should be made to identify the specific strengths (resources) in each region and to make constructive suggestions for building upon them. In this connection, it should be borne in mind that what appears to be a weakness in one context may be a strength in another. For example, disguised unemployment, usually seen as a weakness, may be viewed as an opportunity to increase output by making fuller use of underemployed manpower.

E. The Role of Agro-Industry

During the taking of the inventory of agricultural resources, the discussion of agriculture's role in the economy or, most likely, the discussion of the present state and potentialities of agriculture, those conducting the stocktaking and diagnostic survey probably will touch on agro-industry as it affects agricultural and rural development. But the subject of agro-industry is so important that it deserves a special section in the survey. This is so because agro-industry may stimulate the expansion of agricultural production, provide employment and raise rural levels of living; and conversely, a lack of processing or other agro-industry may impose constraints on a country's agricultural development. Indeed, agro-industry can spell the difference between rural development and stagnation. In two otherwise similarly endowed rural areas, one may develop much faster than the other if the former establishes the right number and kind of agro-industries and the second does not.1/

The survey should include a description of existing agro-industries, by types. The major kinds of agricultural inputs, rural consumer goods produced or agricultural commodities processed should be listed, as well as the quantities of commodities produced or processed. The description should indicate the character of existing agro-industries, the extent to which production is in cottage industries and/or separate plants and whether plants are power driven. For each major agro-industrial branch, the description should cover the general extent to which labor-intensive and capital-using techniques are employed.

1/ S.R. Sen gives a good example of this in discussing eastern Punjab and eastern Uttar Pradesh (U.P.). He attributed the more rapid development of eastern Punjab to the establishment of a much larger variety of medium and small power-driven agro-industries there than in eastern U.P. and the much stronger urge for a higher standard of living among farmers in eastern Punjab than in eastern U.P. (116, pp. 11-12) Of course, the stronger desire for a high standard of living among the farmers of eastern Punjab than among those in eastern U.P. may help account for the establishment of the greater number of agro-industries in eastern Punjab than in eastern U.P. Mr. Sen also cited the Kaira district of the Indian State of Gujarat as another area which prospered as a result of the establishment of small ancillary industries. (116, p. 12)

The dispersion of the industries in rural and urban areas should be indicated, as well as the size of plants. The number of persons employed in each of the major branches of agro-industry should be listed, as well as the extent to which agro-industries draw workers from farm communities. The extent to which agro-industry is financed by farmers, private entrepreneurs or the public sector should be described, as well as the extent to which major agro-industrial branches are integrated with agriculture.

The major problems confronting the most important branches of agro-industry should be discussed, including, for example, lack of adequate credit, power or transport facilities; need for technical information or advice for improving product design and marketing; competition from products of larger-scale, urban-based, or foreign industry.

The survey should consider the possibilities for establishing small- and medium-scale agro-industries and the pre-requisites for this. In particular, the survey should examine the possibility that the lack of adequate agro-industry might be a bottleneck to further agricultural development. It should indicate whether existing producer cooperatives or other organizations are equipped to set up and operate agro-industries or whether new organizations are likely to be needed to stimulate agro-industry. (20, p. 54) It should also indicate whether there appears to be scope for joint ventures between farmers and private investors and indicate how such joint ventures might be organized and financed.1/

Where relevant, the description should indicate the role which trade associations play in coordinating and otherwise influencing agro-industries and the impact of these activities on the agricultural sector. Finally, the survey should indicate what public policies and programs might be set up to promote agro-industry and the extent to which the private investors, farmers and the public sector might cooperate to maximum advantage in rural-based agro-industry.

1/ PROLACSA, a joint enterprise of Nestlé and Nicaraguan dairy farmers, is an example of the type of venture which might be considered. PROLACSA was initiated in 1969 to open up profitable outlets for additional milk produced by beneficiaries of a loan from the Inter-American Development Bank (IDB). The milk is used to produce powdered milk for the Central American Common Market countries. The IDB loan provided funds for the plant's equipment as well as an access road to the plant. Nestlé provides knowhow at the farm and plant levels and is the sales agent for the plant's output. (117, p. 11)

F. Projecting Demand for, and Supply of, Agricultural Products

The fifth element in a stocktaking and diagnostic survey, the projection of demand for, and supply of, agricultural products involves the use of methodological techniques of some complexity. Some of these techniques are still evolving. Annex B contains a resume of the present state of the art, its rationale and some of its deficiencies. The resume is intended to provide benchmarks for agricultural planners who wish to use the techniques given in the references referred to. At this point, only the difference between projections and targets, as well as the relationship between the two, are considered.

1. Projections versus Targets

Production targets for agriculture may be set in any one of several ways. They may be fixed on the basis of more or less detailed field surveys, extrapolation of past production data, estimates of future demand based on a specific nutritional standard,1/ estimates of the level of agricultural production required to achieve aggregative targets in a national or regional development plan, or essentially arbitrary on subjective grounds. But it is generally agreed that the preferred way of arriving at production targets for an agricultural development program is to base them on estimates of future levels of consumption for agricultural commodities.

This is so despite the fact that accurate projections of consumption depend on good statistics which are often scarce. Even when statistics are not completely reliable, it is generally believed that in the hands of a competent technician, margins of error may be kept within permissible working limits.2/ Permissible margins or error are most likely for projections of domestic demand, especially at low income levels, and for short periods up to about five years. It is less likely to be true of demand projections at higher income levels, or for longer periods; for foreign demand, or in situations where unusually great economic or political instability prevail. (28, p. 1174; 156, p. 6)

1/ E.g., in Bolivia's Plan for 1962-71, demand for foodstuffs, as well as production targets, was determined on the basis of estimates made by Bolivia's Ministry of Health of the "minimum recommendable diet according to age, sex and occupation." (118, p. 73) Nutritional norms have also been used in Ghana and Madagascar in setting output targets. (29, p. 19)

2/ There are those, however, who disagree. For example, D.G. Johnson does "not believe that projections that can now be made possess the necessary degree of accuracy to make it feasible to rely upon detailed planning procedures...." (28, p. 1177)

Production and supply projections, whether of individual products or of aggregates, are more subject to uncertainty than demand projections. The effect of some uncertainties may be mitigated, but it is generally impossible in the present state of the art to make supply projections with the accuracy of those made for demand. Nevertheless, supply as well as demand projections are generally recommended for plans for agriculture since practicable output targets must take account of the kind and amount of agricultural commodities which can be produced with available resources.

If the targets in an agricultural plan are to be chosen for their economic, political and social viability, they should be selected only after alternative projections have been made and evaluated to reveal the feasible possibilities for action.1/ Since each projection embodies its own assumptions, comparisons may be made of the economic effects of the varying, sometimes complementary, sometimes conflicting, assumptions on which each projection is based, thereby determining the most economic or otherwise most acceptable variant. Projections thus serve as a valuable tool in target-setting and are in fact a first step in setting targets.

So closely allied are the procedures by which projections are prepared and targets are set that they can be considered to be parts of one procedure. Yet projections and targets are conceptually and operationally two distinctly different things. Projections are quantified forecasts of the likely response of a multitude of producers and consumers, to assumed government policies and events, without any attempt to affect the response which is being forecast. In contrast, targets are a specific prescription for the future which require the adoption of specific policies and measures for their achievement.2/

Targets may be based on projections, but they need not be the same as any projection. (149, p. 273) Projections are useful for taking the spectrum of possible options into account without

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1/ For example, separate demand projections may be made with demographic assumptions at high, medium and low levels; or one set of supply projections may be made with optimistic assumptions and another with pessimistic assumptions. See, for example, 157, p. 274.

2/ It is possible and it may be desirable to include with each original projection an indication of the actions required to realize them, but this differs from the adoption of specific policies and measures to achieve the projection selected as a target.

resolving which projection is to be selected as an output target until the different projections have been completed and compared. Conceptually, therefore, projections constitute a way of exploring different variants before one projection (which may be an amalgam of two or more of the original projections) is selected as a program target. Thus, the target is a result arrived at after a variety of projections have been considered. It follows, therefore, that operationally, the preparation of projections precedes the setting of targets, although in the process of setting targets it may be necessary to amend or supplement projections prepared earlier. (158, p. 527)

The projection of demand does not imply freedom of consumer choice or the allocation of resources through the market. A government may wish to stimulate the consumption of some commodities or bring about a reduction in the consumption of others. It would then set targets in the plan to produce a different pattern of consumption or output than what would have materialized if consumers had followed their own inclinations. Even so, it is desirable to project what consumers themselves want, partly to avoid waste of resources to produce what is unwanted, and partly to determine the extent to which intervention is needed to decrease or increase demand to conform with development objectives. (125, p. 40)

G. Informational Gaps

The preceding discussion about the content of stocktaking and diagnostic survey has occasionally touched upon the scarcity of reliable data. But for the sake of simplicity, the discussion generally assumed that the required data were available. In fact, however, great gaps in the information needed to carry out a stocktaking and diagnostic survey, as well as a plan for the agricultural sector, surely will be exposed as a survey proceeds. In many countries, even the most basic data required for planning does not exist.1/ In the sixth and last step of the survey, therefore, it is essential to collect and list in an organized way the informational gaps revealed as a stocktaking and diagnostic survey proceeds.

While the conceptual framework for analyzing agriculture in developing countries is reasonably satisfactory, the great deficiency is in the scarcity of reliable empirical evidence. (13, p. 54) As a result, one of the most serious impediments to consistent plan formulation and implementation is the lack of data. (146, p. 51)

1/ The New York Times for June 24, 1972 states that, "Indonesia, for example, was for decades a land of about 3,000 islands -- until aerial photographers counted 13,667 of them a few years ago. What's on them, however, is another question. Last year, an exasperated...jounalist from Singapore cabled his newspaper a report that began: 'Indonesia is a land of incredible statistics, most of which are simply not available.'"

In many countries, the only production data with much reliability involve major export commodities and those which are commercially produced. Censuses of agriculture are recent innovations. They are hampered by lack of maps, by small and irregular fields in which crops are often grown, by the prevalence of mixed and successive cropping, by widespread subsistence production, and by the illiteracy of the producers from whom data must be obtained. (131, p. 329) It also takes a long time to obtain, assemble and check data from the large number of farms found in many countries. (4, p. 108)

In most developing countries, the list of informational lacunae is likely to be long. Much of the basic data is likely to be little more than guesswork.1/ What is available is often of questionable reliability. Attempts to compare data often rest on extremely weak foundations. The national income accounts, none too precise for most sectors, are likely to be least accurate for the agricultural sector, sometimes under-estimating, sometimes over-estimating output.2/

To obtain the value added in agricultural production, it is necessary to know output quantities, prices obtained by farmers, paid out costs of raw materials and intermediate goods, non-paid out costs (e.g., for seed and wastage), and depreciation allowances. None of these data is generally available in developing countries. (34, pp. 21-22) In the Near East, for example, only four countries

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1/ In Ceylon, the Food and Agriculture Organization of the United Nations reported that for many crops and for animal husbandry as a whole, the statistics "could be called pure guesses." (157, p. 271) In Iran, also, a planning specialist reported that many of the data used in agricultural planning "were no more than informed guesses." (30, pp. 13-14)

2/ This is true in almost all underdeveloped countries. But most of these countries try to use what national accounts data are available. Not so in the Somali Republic, where the First Plan stated that "The methodology of planning for the Somali Republic does not follow the usual pattern based on the gross national product (GNP) approach, for the simple reason that information about GNP is not available." The Plan then went on to say that other data were either not available or, if available, unreliable and incomplete. This was true of population, birth and death rates, labor force, immigration and emigration, employment and unemployment, areas under different crops, agricultural production, yields for various crops, agricultural holdings, livestock production and trade, forestry and fisheries, etc. (159, pp. 16-17; 160, p. 25) The lack of data may be especially great in the Somali Republic, but there are many developing countries where the size and structure of the agricultural population are not known with precision, let alone the structure of land holdings, the total acreage and yield of individual crops, or the number and yield of the main classes of livestock. (14, p. 582)

were publishing details of their agricultural GDP in 1968. This contrasted with eight countries in the area which were publishing details of their industrial GDP at the time. (148, p. 2) In Pakistan, "the immense void of farm level and other micro data" was found to limit effective planning. (161, p. 29) This is true for many other undeveloped countries.1/

Inventories of agricultural resources are hard to carry out in the absence of reliable statistics on natural resources (especially water supply), capital inputs (especially working capital), institutional facilities (especially as regards their limitations), and human resources (especially the extent of their under-employment). Determining prices of agricultural products in poor countries is extremely difficult because of price variations in time and place. Projections of final demand are usually based on shaky statistics. In many countries, income elasticities are unavailable, so that expected increases in demand have to be estimated arbitrarily. There often are few dependable statistics on the quantities of foodstuffs being produced for commercial sale, which makes it difficult to relate output to capacity. The lack of good information about area yields for each major crop, (161, p. 29) inputs, rainfall and prices, makes it difficult to forecast production; and the paucity of reliable data on subsistence foods and stocks makes it difficult if not impossible to forecast supply.

Basic economic data for intelligent planning for forestry are often lacking in developing countries. (162, p. 158) The planning of fisheries development presents special difficulties, in particular because of the lack of knowledge about the size, mobility and reproducibility of the resource base. (2, p. 130)

In these circumstances, margins of error in the available data are often so large that projections based on them appear to be of doubtful value. Yet, if agricultural planning were to wait on perfection of the data, it could not begin for many years in most less developed countries. It is preferable to initiate the planning process as soon as possible by assembling the information available and using it with judgment and appropriate qualifications to make the best possible decisions. (112, p. 2)

However, the more complex and detailed a plan, the more information is needed. For this reason, it may be desirable at early stages of development, when data are scarce and unreliable, to begin the planning process with a simple plan which is largely confined to the provision of basic inputs and the creation of key

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1/ For example, the Organization of American States has reported that information on agricultural capital and other aspects is fragmentary or wholly lacking in most Latin American countries. (104, p. 122) In the Near East, the shortage of statistical data has limited the formulation and implementation of agricultural development plans. (99, pp. 250-251)

institutions. (127, pp. 379-80) As information improves, plans gradually can be made more complex. (22, p. 6) By avoiding the formulation of plans which are too elaborate for the available data to support, planners can produce realistic plans quickly.

Those who conduct the stocktaking and diagnostic survey are in good position to evaluate the extent to which data are available for plan formulation. They should, therefore, consider this as part of their task, and include recommendations concerning the complexity of the planning which the data permit.

Many gaps in the data will be exposed during the conduct of the stockbuilding and diagnostic survey; others will be revealed during later stages of the planning process. As part of the planning process, a multi-annual research and studies program should be devised with a view toward filling the most important informational gaps in accordance with an appropriate set of priorities and a suitable timetable.1/

H. If the Survey Team Comes from Outside the Country

The extended and detailed discussion about the character and composition of the stocktaking and diagnostic survey should make clear that it is a vital part of the planning process for the agricultural sector. It is no exaggeration to say that the rest of the planning process will depend in large measure on the results produced by the survey. If all possible sources of data have been thoroughly combed and the available data assembled and analyzed in ways which provide planners with clearly defined issues and alternative ways of dealing with them, the rest of the planning process will be greatly facilitated.

It is therefore imperative that those who make the survey be provided with carefully worked-out terms of reference for the conduct of the survey which embody precisely what is wanted and what is not. Annex C contains an example of such terms of reference. It needs to be stressed, however, that the terms of reference for each country must be specifically tailored to its own conditions and development objectives. For terms of reference are bound to vary with a country's stage of development, type of agriculture, emphasis given to each agricultural subsector, and most important, whether the primary development objective is growth in national output and incomes or, alternatively, equalization of regional or income disparities.

The number of members of the survey team and the expertise required will also vary from one country to another, depending on the nature of the agricultural sector, the size of the country, and the complexity of the problems likely to be encountered. In the

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1/ The nature of the research and studies program is discussed at a later point.

terms of reference in Annex C, a total of 17 team members is envisaged (including the Head of the Team and the Team's Secretary), but the number might be larger or smaller for a specific country.

Since it is essential that the nature of the problems likely to be encountered, and their level of complexity, be adequately gauged before a survey team is assembled, it is desirable to have one or two specialists (including the one who will lead the team) carry out a preliminary inspection trip in the country concerned to determine the nature and scope of the problems required in the agricultural sector. Such a trip, of about two weeks' duration, can do a lot to prepare the way for a survey team. Among other things, those who make the preliminary trip can determine the number and kind of experts which will be required, the likely duration of the survey team's stay in the field, and the availability of information about agriculture.

In this connection, and on the basis of the findings of this preliminary inspection trip, a request for information required by the survey team should be prepared as soon as possible after the trip and forwarded for action to the appropriate official of the country concerned. The request, which should be prepared with considerable care, should ask that the materials to be collected for the survey team be ready at least two weeks before the survey team is scheduled to begin work. Annex D contains a hypothetical request for information. As in the case of the terms of reference, the content of the request for information will depend on the nature of the agricultural sector in the country concerned and the scope of the contemplated survey. A member of the survey team should be assigned to the place where the information is being assembled to inspect it at least two weeks before the survey team begins work, and to ask officials concerned to fill informational gaps as quickly as possible.

When a survey team has been assembled, and before it leaves for the field, briefings for its members should be conducted for at least one week, during which team members should try to familiarize themselves with the country and its problems, the objectives of the survey; the functions of each team member; his or her responsibilities and timetables; administrative, reporting and consultation arrangements; etc. If this is done, the team will be prepared to begin work in the field at the appointed time with little waste of effort and time. Thereafter, weekly meetings should be held in the field and, to the extent possible, each team member should report orally on the progress of his work, problems encountered, successful practices employed to achieve results, etc. In this way, each team member will be kept informed about the work of his colleagues and learn from their experience. The weekly

team meetings should be supplemented with meetings between the team head or his deputy and a team member where it appears that the team member is in need of guidance or other assistance.1/

The choice of a proper head for the survey team should be given considerable thought. Ideally, the one chosen should combine technical, managerial, and leadership abilities with tact and the ability to obtain the cooperation of government officials and others whose acceptance of the team is essential to its success. It is rarely possible, in practice, to find one individual with all the required talents. Even if one can be found, he can hardly be expected to find the time required to do all the things which must be done if the survey team is to function satisfactorily.

Because of the difficulty of finding a head of a team with all the needed qualifications and in the light of the pressures which a team head is likely to undergo, consideration should be given to dividing leadership responsibilities between the team head, a deputy head and, if need be, others. Experience shows that it often is desirable for the head of the team to concentrate on policy and the team's relationships with government officials and others to whom the team must look for information and acceptance; and for the deputy head to concentrate on the team's administrative tasks and the direct supervision of the team members' work. The actual division of functions between the head and his deputy will depend on the training and predilections of the head of the team. But the point to remember is that, depending on the head's training and disposition (e.g., is he primarily a technician or does his strength lie in diplomacy?), he must be supported by a deputy head or others on the team to the extent required to insure that the team's outside relationships, policy formation and technical work each receive the attention required for efficient operations.

I. The Survey as an Institutionalizing Medium

The stocktaking and diagnostic survey must be seen as more than an exercise in gathering and analyzing data, important though this is for planning for the sector. When properly organized and conducted, the survey can also become a means of promoting the institutionalization of improved organization and management of the agricultural sector. Specifically, the survey should be considered as a vehicle for (a) on-the-job training and (b) establishing

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1/ By these means, each team member will know at all times what is expected of him and the heads of the team will know what each team member is doing. Where such regular meetings are not held, a team member may find, as one who spoke about his experience to the writer found, that he "worked for four weeks on a team before finding out what the head of the team wanted done."

(an) effective agricultural planning unit(s). These ends may be achieved by the assignment to the survey team of individuals who either are or will become senior staff members of (an) agricultural planning unit(s). These individuals should participate from beginning to end in the survey, including its design. While the survey is being conducted, the members of the survey team [if they are not the same as the senior staff of the existing or to-be-established agricultural planning unit(s)], should train the members of the senior staff (-to-be) in the techniques of data collection, collation and analysis, and make certain that they are involved in all aspects of the survey. Indeed, the senior staff (-to-be) should participate as full team members in discussions concerning all problems encountered in carrying out the survey. If this is done, they should be in an excellent position after the survey's completion to carry on the continuing planning activities in the agricultural sector. If the main body of the survey team is composed of other than the senior staff (-to-be), one or two should stay on for a year or two after the survey's completion to help the staff of the agricultural planning unit(s) convert the data in the stocktaking and diagnostic survey into an on-going agricultural plan and to organize and put the agricultural planning unit(s) on a sound footing.

VII. SETTING TARGETS AND ALLOCATING RESOURCES

A. Introduction

An objective is the end result which the planning process is designed to achieve. That is why clearly defined objectives (there may be more than one, of course, just as there may be objectives for inputs as well as outputs) are essential to good planning. If the objectives are ambiguous, contradictory or otherwise subject to being misunderstood, they provide inadequate guidelines for planners, with the likely consequence that the planning process will produce a plan which charts an uncertain course.

But even when an objective is clear beyond doubt, it is unlikely to be stated in sufficiently concrete terms to determine whether there are enough resources to achieve the objective in a substantial way, permit available resources to be allocated to achieve this, and measure in reasonably precise terms progress toward realization of the objective. When the objective of an agricultural development plan is to increase production, reduce unemployment or raise the level of incomes of poor farmers, the question is not so much what is meant but how much. To answer this question requires the setting of numerical targets. By restating objectives as quantities, targets permit (1) the viability of the objectives to be tested against the availability of resources, (2) precise earmarking of resources for achieving objectives, and (3) establishment of suitable criteria or indicators to measure the success with which plan objectives are being achieved.

But the quantification of objectives in the form of targets has importance for planning beyond these advantages because it requires those who set the targets to choose from among available alternatives the direction, scope, relative priorities and size of the development effort. This is ultimately a political responsibility because, as with the setting of objectives, it involves political and social, as well as economic choices. Consequently, targets must be set by political authorities rather than by planners. Nor may the political authorities cede this obligation to the planners. For only if the political authorities accept responsibility for selecting targets which set the levels of the development effort is there reason to hope that they will accept responsibility for adopting the strategies, policies and measures required to attain plan targets. (120, p. 55)

There are those who believe that planners should try "to sell" their ideas to the political leadership. (155, p. 2) But even they concede that "plans must be approved by politicians before being implemented, (and that) the political acceptability of

a plan is...a prerequisite of any practical program." (155, p. 6) Planners almost always have their preferences and they cannot be expected to stifle them in pursuit of the chimera of value-free planning. When their preferences are based on sound technical grounds, they have every right to a hearing. But when the preferences reflect their social and political views, it is hard to see how they, as planners, can claim special prescience. They must accept the reality that the social and political factors in the planning process are prerogatives of the political leadership.

However, although planners must defer to political authorities in setting targets, they have an important role to play in the process. Since planning is designed, in considerable measure, to alter prevailing economic forces as required to attain targets, (120, p. 65) planners are able to furnish political authorities with useful information about the economic consequences of setting targets at different levels. Different targets usually require different policies, investments and other actions, and planners should present political authorities with a series of alternatives, based on projections or other estimates of current and future situations, which allow the political authorities to weigh the advantages and disadvantages of each alternative. Only by careful consideration of the cost and other implications of each target, is it possible to make a rational choice among them.

Targets are a way of getting specific about "who gets what" in the development process, and this unavoidably affects people differently. The political authorities are likely to know what they consider desirable, but the planners have the techniques to tell them whether what political authorities consider desirable is feasible. The targets selected should balance the desirable with the possible. In the end, therefore, planners must have a say in the setting of targets if plans are to be implementable.

B. Targets vs. Projections

It is true, of course, as one publication put it, that "success in reaching a target may mean that the target was too low in relation to what might have been achieved with a more dynamic policy...," (120, p. 55) but experience indicates that what is considered a "desirable" target is more likely to be higher, not lower, that what is possible.1/ Unrealistically high targets

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1/ This is most likely to be true of production targets. Understated targets are usually for inputs, e.g., fertilizer. It sometimes happens that understated input targets and overstated production targets exist side by side in a plan. The outcome is not difficult to foresee, even if the input targets are fulfilled.

are sometimes justified on the ground that high targets are needed to inspire high levels of effort.1/ The difficulty is that when a target is set unrealistically high, it may have the opposite effect. Indeed, if a target is set so high that those who must realize it consider it impossible to attain, it runs the risk of being ignored. Then, it both fails to inspire high levels of effort and to guide planners in allocating resources or adopting appropriate policies and measures to achieve the target. (120, p. 65)

In the longer run, unrealistically high targets raise the possibility that success will not be recognized when it has been achieved. If a reasonable production target calls for an average increase of, say, three per cent per year, but the target is fixed at five per cent, achievement of the three per cent increase appears to be a failure rather than a success. One consequence then might be that in seeking successes to emulate and build upon, planners would pass over as a failure what was actually a success.

Despite the clear disadvantages of unrealistically high targets, they are common in development plans. While increases in agricultural production of four to five per cent annually are widely considered to be respectable,2/ many developing countries set much higher targets. For example, targets for annual increases in agricultural output have been set by Iraq at 7.5 per cent; by Bolivia at 6.3 per cent; by Burma at 6 per cent; and by Uganda, Senegal, the Philippines, India and Madagascar from 5.3 to 5.9 per cent. (1, p. 56)

Nor has the situation been different in the socialized countries. North Korea set an ambitious target for an annual increase of 13.2 per cent in agricultural output in its Plan for 1961-67. (1, p. 56) Albania's targets for the growth of gross agricultural output in 1971-75 range from 8.5 to 9.2 per cent per annum, while Rumania's agricultural output targets range from 6.3 to 8.3 per

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1/ But political motives may also be behind the unduly high targets. Thus, a former member of India's Planning Commission has described how, at a meeting of the Commission, the Minister of Finance urged that high targets be set for the Fifth Plan because they look good and "even if it was known in advance that they would not be fulfilled." The Minister contended that there was no need to be squeamish about setting high targets because, despite the fact that "few Plan targets had ever been fulfilled in the past...this had not affected the popularity or credibility of the government of the day." (163, p. 2124)

2/ Arthur Lewis puts it more strongly: "An annual rate of increase of 5 per cent (for agricultural growth) must...be regarded as a remarkably high achievement, and claims in excess of this must be treated with suspicion!" (165, p. 155)

cent per annum. (164, p. 58) The U.S.S.R. and Mainland China have also been known to set unduly high agricultural targets.

In all the countries named, previous rates of increase were substantially below the listed growth rates.1/ There were, moreover, good reasons why a sudden upward spurt in the growth of agricultural output was unlikely in most countries.2/

A pronounced difference between proposed and previous production can also be found in other developing countries. For example, Afghanistan's Plan for 1967/68-1971/72 set a target increase of 16 per cent in agricultural production for the Plan period, when the increase for the preceding five-year plan period had amounted to only 1.6 per cent; (168, p. 188) and Sri Lanka's Plan for 1970-1976 calls for annual increases of 4.9 per cent in agricultural output, when annual agricultural growth reached a level of only 1.7 per cent in 1966-71. (166, p. 23) Iran's

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1/ Thus, Iraq's proposed growth rate of 7.5 per cent for 1965/66-1970/71 compared with a growth rate of only 1.8 per cent in 1961-66; Bolivia's proposed growth rate of 6.3 per cent for 1962-71 compared with a growth rate of 4.6 per cent in 1961-66; Burma's proposed growth rate of 6 per cent for 1966/67-1969/70 compared with a growth rate of 0.7 per cent in 1961-66; Uganda's proposed growth rate of 5.3 per cent for 1966-71 compared with a growth rate of 2.2 per cent in 1961-66; Senegal's proposed growth rate of 5.4 per cent for 1965/66-1968/69 compared with a growth rate of 2.0 per cent in 1961-66; the Philippines growth rate of 5.5 per cent compared with a growth rate of 3.2 per cent in 1961-66; India's proposed growth rate of 5.6 per cent compared with a growth rate of -0.7 per cent in 1961-66; Madagascar's proposed growth rate of 5.9 per cent in 1961-66 compared with a growth rate of 3.5 per cent in 1961-66; (166, pp. 23-24; 1, p. 56) Albania's 8.5 to 9.2 per cent growth rates for 1971-75 compare with a growth rate of 5.2 per cent in 1961-65 over 1956-60 (data for 1966-70 unavailable); and Rumania's 6.3 to 8.3 per cent growth rates compared with a growth rate of 4.2 per cent in 1966-70 over 1961-65. (164, p. 58)

2/ The situation in Syria was not atypical. In that country, only 9.9 per cent of the public allocations planned for agriculture in the Second Five-Year Plan for 1966-1970 had been spent at the end of 1969. According to a United Nations report, "that so little was spent on agriculture in comparison with what was allocated for it was said to be the result of financial problems, multiplicity of decision-making centres for some projects, lack of incentives, etc. The small amount of money spent explained why in most cases, crop and livestock production lagged far behind planned production goals." (167, p. 9) The reasons given also explain why Syria's 6.7 per cent annual agricultural output target for 1966-70 was over-ambitious.

agricultural growth target of 4.4 per cent per annum in the Fourth Agricultural Plan for 1968-1972 also was substantially higher than the annual rate of growth of 3.5 per cent in 1966-71. (166, p. 24)1/

Targets calling for excessively large increases in overall agricultural output require excessively large increases in the output of individual crops. (169, p. 188) Thus, production of a wide range of food crops in Sri Lanka would have to increase by 10-40 per cent annually from 1970 to 1976, in each case by percentage growth points much higher than those achieved in the 1965-70 period, for the annual overall agricultural growth target of 4.9 per cent to be achieved. In these circumstances, it is understandable why many targets are never realized.

There is nothing inherently wrong in setting agricultural targets at levels which are substantially higher than in the past, provided appropriate steps are taken to insure the effort needed to achieve the targets. For example, when Israel's Five-Year Plan for Agriculture called for an increase of 35 per cent in agricultural production during 1966/67-1970/71, the Plan indicated that the production target would be achieved by greater mechanization and increased productivity. To these ends, overall investment was planned to increase to 725 million Israeli pounds, of which 183 million pounds were to be spent on stockfarming, 126 million pounds on machinery, and 110 million pounds on irrigation projects. In addition, policies and measures were to be adopted to bring about an increase of 75 per cent in exports during the Plan period (Bank for International Settlements, Press Review, No. 220, November 15, 1966). Who was to do what and when were spelled out and put into effect. Small wonder then that the targets, although ambitious, were realized.

But few of those concerned in developing countries seem to be adequately aware of the effort required to achieve targets included in agricultural plans. This is even true of India, whose planners include some of the best-trained technicians to be found anywhere. It is understandable that, in the early days of Indian planning, inexperienced planners could increase the target for agricultural growth in India's Second Five-Year Plan for 1956/57-1960/61 without providing for additional effort and inputs to achieve the higher target; (49, p. 58) but it is harder to understand how the annual target for agricultural growth in the Fourth Five-Year Plan for 1966/67-1970/71 could have been fixed at 5.59 per cent, when in the ten years, 1952/53-1961/62, the compound rate of growth in agriculture had been only 2.94 per cent, and few new factors were visible at the time the Fourth Plan was drafted to warrant the assumption that the growth rate for agriculture

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1/ The inflated character of the target became apparent when figures, released for the Persian year between March 1969 and March 1970, revealed that agricultural growth had actually slowed down that year to 1.7 per cent (The Financial Times, October 20, 1970, p. 9).

could be increased by 90 per cent during the 1966/67-1970/71 Plan period. The target fixed is even more difficult to understand when it is realized that the planners expected the rate of agricultural growth to almost double virtually entirely as a result of increased productivity, when productivity had increased by only 1.67 per cent during the preceding decade (B.M. Bhatia, The Economic Times, October 6, 1966). In Sri Lanka, the planners seem to have assumed that increases in the output of various crops, ranging to 40 per cent, would somehow occur between 1970-1976 without provision of additional extension services, credit, seed and fertilizer supplies, improved marketing, price and other supports and in the face of an acute lack of financial resources to support the ambitious capital investment program included in the Plan. By assuming the existence of what was lacking, the planners were in fact assuming away the problems which had to be faced before agricultural targets could be realized.

When a government or planners fail to adopt adequate measures and provide support services and other means required to achieve targets, it is in effect relegating the targets to the level of projections. No measures or special means need be employed in dealing with a projection, since it is merely an estimate of what will happen under given assumptions about the behavior of producers, businessmen, consumers, governments or combinations of these, within a given economic, social and political framework and time horizon. And while a projection may be converted into a target by adopting appropriate policies and other means to insure its realization, what is called a target is, in fact, no more than a projection if palpably inadequate provision is made for its fulfillment.1/ Consequently, although planners are supposed "in theory to distinguish meticulously between projection and targets," (170, p. 78) in practice they often do not. The test of a target is whether adequate means are provided for its attainment. To the extent that the means are inadequate for this purpose, the "target" is really no more than a projection.

The need to provide appropriate means for achieving targets is all the more important where, as in mixed-economy countries, plan targets are only guidelines or indicative of government intentions rather than orders whose violation may invoke legal or other sanctions. In the classic version of the Soviet planning model, there was no need to stress that targets were more than projections, since the system of balances employed in the planning process was a conscious attempt to insure that a sufficient amount of needed inputs would be made available to achieve output targets.

1/ There is only one possible exception to this rule: long-term (perspective), as distinguished from medium-term and short-term, plan targets (like objectives) may be used more as indicators of future trends than as operational devices. (4, p. 111) Nevertheless, even in the case of long-term targets, it is desirable to indicate what supporting means will be required to achieve the targets.

To the extent that planners were successful in balancing inputs and outputs, it is fair to say that output targets in the Soviet planning system met the test of a target enunciated in the preceding paragraph.1/

But in the planning regimes of the mixed-economy countries, command production targets, supported by commanded supplies of inputs which planners have estimated to be necessary to attain production targets, are virtually unknown. In these countries, therefore, governments need to make special efforts to insure that inputs -- be they physical, financial, policy or other -- are made available at appropriate times and in amounts. combinations and locations calculated to attain plan targets; and "it is important to be reasonably sure that the tasks are physically and organizationally feasible of attainment." (47, p. 203)2/

C. The Kind and Number of Targets

Planning specialists have varying views about the kind and number of targets which should be included in an agricultural plan. Those at one extreme contend that "it is important that the plan contain specific targets for each of the activities designed to affect agricultural output..."; (171, p. 31) those at the other extreme, hold that for mixed-economy countries which participate in international trade (and hence can import agricultural commodities they do not produce domestically), agricultural productivity targets are more useful than output targets. As one exponent of this

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1/ Not that the planners always succeed. For example, in the U.S.S.R.'s Eighth Five-Year Plan (for 1966-70), new irrigated land fell short of the Plan target by 35 per cent; for land reclaimed by drainage, by 37 per cent; for tractors, harvesters and fertilizers, by 15 to 20 per cent; and for overall investment in agriculture, by 18 per cent (Economic and Political Weekly, Vol. 8, 22 December 1973, p. 2269).

2/ It should go without saying that this requirement is not fulfilled when a level of inputs is assumed which is unlikely to be forthcoming. India's Fourth Plan furnishes an example. Against a shortfall of 50 per cent from the comparatively modest chemical fertilizer targets of the Third Five-Year Plan period, the Planning Commission assumed the availability of a 300 per cent increase in chemical fertilizer in the Fourth Five-Year Plan period without indicating how the additional fertilizer was to be obtained. Similar optimism prevailed for green manures, with a 300 per cent increase in the Fourth Plan period after a 50 per cent shortfall in the Third Plan Period (B.M. Bhatia, The Economic Times, October 6, 1966).

point of view says: "So long as agricultural productivity goes on improving, it does not matter very much from the point of view of development how the crop pattern behaves so long as adjustments are possible through trade." (109, p. 17) Other specialists have other views. Thus, Arthur Lewis states flatly that "Most of the targets for commodity output are not to be taken seriously; what matters is the level of total investment and output..."; (165, p. 273) while P.M. Smallfield contends that targets may not "be necessary or desirable where a general increase in production can be encouraged by promoting technological advances and such inputs as fertilizers and better equipment." (9, p. 56)

However, if the targets included in agricultural plans are an indication, most planners prefer to set targets for many, if not all, "activities designed to affect agricultural output." (171, p. 31) Thus, Pakistan, (173, p. 127) Madagascar, Tanzania, Tunisia and Egypt have set targets in their plans for reducing the share of agriculture in the national output. (29, p. 8) While Egypt, (174, p. 65) Syria, and Taiwan (175, p. 40) have had plan targets for increasing agricultural employment, Pakistan, (173, p. 127) the U.S.S.R., (176, p. 149) and Japan (81, p. 74) have had targets for reducing the number of persons working in agriculture and increasing productivity.

Nicaragua set targets in its 1965-69 Plan for lowering the death rate of calves and reducing the age at which cattle were slaughtered. (177, p. 170) A host of input targets have been set in many plans, from Kenya's targets of gross capital formation in agriculture, livestock and fisheries, (178, p. 114) to the Republic of China's target for the construction of forest access roads. (175, pp. 40-125)

Tanzania has had a target for increasing the number of cooperatives and the percentage of cattle to be marketed through them. (29, p. 31) Spain set targets for the number of tractors to be put into service and the gross registered tonnage which its fishing fleet would attain; (179, pp. 54, 58) so has the Republic of China. (175, pp. 40-125) Many countries have had targets for inputs of fertilizers, pesticides, newly irrigated lands and new areas to be settled; (179, p. 54; 179, pp. 56-57; 175, pp. 40-125; and 178, p. 108) and Malaysia has set targets for new rubber plantings. (95, p. 62) South Korea (180, p. 63) and Kenya (178, p. 95) have had targets for exports of various agricultural commodities, while Israel has had both export and import targets, among many others. (101, pp. 355-363) Of course, other countries have had similar and still other targets; and specialists have suggested yet other targets as appropriate.1/

1/ For example, the UN's Committee for Development Planning has suggested that targets might be fixed for new areas brought under cultivation, yield increases on existing areas, acreage to which new and improved seed were applied, price ratios between outputs and inputs by major crop, acreage on which land reform was to be carried out, agricultural research and experimentation, and control of pests, weeds and animal diseases. (171, p. 31)

Production targets have been set in virtually every plan in various degrees of aggregation. Thus, while many countries have set targets for the output of individual crops, some have set them for groups of crops (e.g., cereals, vegetables or fruits), for subsectors (e.g., field crops, animal products, forest products or fish), or for the entire agricultural sector. Targets have been set in physical terms; in terms of value, usually in constant prices; or as production indexes (sometimes subdivided into subindexes for domestic consumption and export).

Not all the targets in a plan are likely to be of equal importance for the realization of the plan's objectives. Thus, a target for the construction of a number of farm buildings during a plan period is less important than a target for increasing production of a major crop and could be dispensed with. Every plan is likely to include targets which are not essential to the plan's implementation. Since the greater the number of targets, the greater the difficulty of fulfilling them, the more desirable it is to reduce the number of targets to the minimum required to reach a plan's objectives. Even the U.S.S.R., which used to consider it necessary to set production targets for many individual commodities, now sets far fewer. For example, in the Plan for 1966-70, output targets were set only for total agricultural production and seven major commodities. (174, p. 59)

One way of reducing the number of targets is to combine several targets into one. A combined or aggregate target is usually easier to achieve than the separate targets for each component included in the aggregate because one component can be substituted for another. For example, in India's First Five-Year Plan, the output target for grain was reached despite a shortfall in rice production because the targets for wheat and millet were over-fulfilled. (181, p. 112) Aggregate targets are useful as measures of overall progress, but they provide limited guidance for producers on the emphasis to be given to individual commodities. (4, p. 112) Where it is important to emphasize one or more commodities over others, therefore, aggregate targets are less useful than targets for the individual commodities concerned.

The greater the number of targets, the greater the need for information; and the informational gap can be more than statistical. For example, ambitious mechanization targets set in Korea's Third Five-Year Plan appear to have little basis, in the light of Korea's limited experience with farm machinery. Soundly conceived targets would have had to be grounded on more knowledge than planners could have had about the probable demand for farm machinery and its likely profitability in the Korean situation. Sometimes, information is even lacking for the setting of aggregated targets. For example, targets have sometimes been set for a total volume of inputs on the basis of an arbitrarily determined overall relationship between a targetted volume of output and the inputs. When such aggregated targets are used, it is difficult or impossible to determine the contribution which each input item makes toward increased output, and whether the proposed input and output targets are mutually consistent. (96, p. 131)

There is a widespread tendency for planners, who sometimes believe they can forsee the future, and administrators, who may wish to control it, to engage in the practice of "targetry" even when it makes little sense to set targets for activities over which a government can have little control. Thus, while it is reasonable for political authorities to set a plan target for a major increase in irrigation which will require and receive from the government the investment funds and support required, it is not sensible for the government to set a target for minor irrigation which requires decisions by many farmers about digging wells and canals, when the decisions are to be elicited by nothing more than the exhortations of extension workers.1/ (182, p. 62)

In summary, therefore, it is desirable to limit the number of targets to the minimum needed to fulfill plan objectives; to make the targets as aggregated as possible, given the need for targets to furnish guidance to producers; and to avoid setting targets for activities which the government cannot influence or control.

Since most planners do not seem to be ready to rely solely on targets for productivity increasing or improving technology, and it is well perhaps that they do not take so limited a view of the function of targets, production targets are needed. Because climate, plant diseases, pests and other uncontrollable factors are likely to cause great variations in output from year to year which cannot be foreseen, it may be better to fix production targets for the last year of a plan period rather than for each year. Production targets for the terminal year of a plan also provide the time needed to adopt measures required to change trends. However, fluctuations in output are sometimes so great that even a target for the terminal year of a plan period may not be effective. For example, during India's Third Five-Year Plan period (1961/62-1965/66), cereal production was virtually stable around 80 million tons in each year of the first three

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1/ In his Presidential Address to the Indian Society of Agricultural Economics, Prof. V.M. Dandekar drove this point home very forcefully. Said he, "We witness the District and Block agricultural officers and the extension workers under them running around with targets of agricultural production, crop by crop, targets of areas to be sown with improved seed, targets of areas to be brought under new minor irrigation, targets of green manuring and targets of compost pits to be dug. In all these cases the officers and extension workers know full well that what they can do in the matter of achieving these targets is extremely limited, and final decisions lie with the farmers.... In consequence, a make-believe world is created in which targets are determined and progress reported in terms of items over which the parties concerned have no authority or control whatsoever. No one believes in these figures, and nevertheless everyone must engage himself in so much paper work which is worse than wasteful...." (182, p. 63)

years of the Plan period. Output rose to 89 million tons in the fourth year and declined to 72 million tons in the fifth year. (47, p. 199) Because great fluctuations in annual output are common, it may be best to use either an average annual output target or an aggregative target for a plan period.1/ (109, p. 16)

Events occurring after the start of a plan period may make it evident that targets have been set too high or too low; or targets may have to be set tentatively because of uncertainties which cannot be resolved at the time a plan is prepared. In either case, targets may have to be revised after the start of the plan period.2/ Provision for such revisions may be made when a plan is formulated. Thus, in the French Plan for 1962-65, targets for the output of cereals were set subject to revision upwards or downwards as domestic and European Economic Community demand became apparent during the Plan period. (170, pp. 46-47) In Kenya, allowance for an average shortfall of 5 per cent for crop production and livestock was included in the 1966-1970 Plan, and growth targets were amended accordingly after the start of the Plan period. (178, p. 85) In agriculture, more than in any other sector, targets must be flexible and subject to revision to take account of changed resources and other circumstances. (120, p. 55; 165, p. 273) What is important for agricultural development is that the trend of production conform to longer-term plan targets rather than that each annual target be achieved, especially since it is difficult if not impossible to predict with reasonable precision output for each year in a plan period.3/

In addition to output targets, input targets are often useful as a measure of the extent to which action needs to be taken to support output targets. But input targets should be used with

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1/ For example, the agricultural targets of the U.S.S.R.'s Five-Year Plan for 1966-70 were expressed in terms of the planned increase in average annual production during the Plan period over average annual production in the 1961-65 Plan period. (174, p. 59)

2/ For example, the annual target for food grains in India's Third Plan, initially set at 100 million tons, was revised in mid-term to 92 million tons when it became apparent that the original target was not likely to be attained. (47, p. 199)

3/ This does not imply that output during each year of a plan period is of no concern; only that since it is virtually impossible to forecast with reasonable accuracy output for each year of a plan period, there is little point in trying to do so.

caution since first, they are no more than a means toward increasing output and, hence, are not by themselves a satisfactory measure of development;1/ second, they may overstate progress because they are usually stated on a gross rather than a net basis (e.g., including new irrigation canals dug while ignoring those which are falling into decay); and third, the input-output relationships on which they are based may be faulty, for a number of reasons, e.g., the original expenditure estimates may have been inaccurate or, although originally accurate, were made obsolete by price changes. Nevertheless, the use of input targets may be warranted because increased outputs may require the planned provision of certain inputs. Moreover, where they are used, a shortfall in input targets can provide an indication of why output targets were not achieved or whether estimated input-output relationships were accurate. (120, p. 56)

D. From Projections to Targets

1. Methods of Setting Targets

It is possible, and common, for planners to obtain agricultural targets simply by setting (a) output targets equal to the estimated increase in demand for agricultural commodities over a plan period; and (b) input targets equal to the estimated inputs required to achieve the output targets. Aside from the circular reasoning (since demand often depends on output), this approach implies that output is a function of inputs solely, rather than a complex amalgam of technological change, institutional factors, climate and producer motivation interacting with the inputs. (127, pp. 382-3)

This approach to target setting also implies that the planning problem in developing countries is to raise output to the level of demand. But this is not necessarily so. It is true that if a country (India is an example) has a chronic food deficit which has to be met by imports, it should give priority to expanding food production and reducing imports. However, if a country (Nigeria is an example) is largely self-sufficient in food production, it might give priority to increasing exports or the output of nutritionally superior foods which could reduce protein deficiencies. (138, p. 36)

1/ In 1958, the Indian Agricultural Administration Committee wrote: "At present we have a spectacle of financial targets being fulfilled without the proportionate additional production being realized." (73, p. 565) A similar situation prevails in many countries.

If the major bottleneck is on the supply side, targets are likely to differ from those when the major bottlenecks are on the demand side.1/ Or if priority is given to increased production for domestic consumption, agricultural targets may differ from those set when the priority is to increase production for exports. And if the objective is to increase rural incomes, targets probably will not be the same as when the objective is to increase agricultural output.

Yet, regardless of the targets to be set for a plan period, estimates must be made of demand for domestic consumption and exports; as well as for supply from current production, imports and stocks accumulated from previous years. In addition, estimates must be made of the extent of financial and real resources, especially those in short supply, available for use as inputs. Together, these elements are essential ingredients for the setting of targets. All are inter-dependent. Demand determines supply and supply determines demand; while resources determine supply and demand, and vice versa.

Because of the closeness of their relationship, it is possible to begin the target-setting process with the resource, supply or demand estimates. (109, p. 14) While planners might differ about which of the three to start with, all would agree that supply and demand must eventually be equated, within the limits of available resources.2/ This equilibrium is not easy to achieve because inconsistencies often show up among the supply, demand and resource estimates. When this occurs, the method by which they are made mutually consistent must be repeated as often as necessary

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1/ However, planners must be able to identify the real bottleneck. Prof. Carl Eicher contends that planners in many less developed countries mistakenly believe that the major bottleneck to agricultural development is supply rather than demand. They therefore set targets for expanding food production. Prof. Eicher thinks that this "supply approach to agricultural planning" needs to be reappraised because "expanding agricultural production much above population growth rates has not and will not contribute to the overall growth of the economy because the effective demand is inadequate to purchase the increased production and, as a result, the expanded output will lead to depressed farm prices and incomes." (138, p. 36) However, another authority argues the opposite. He holds that "In low income countries, it is most common for a program of planned development to cause demand for food to grow faster than domestic food production can be raised." (11, p. 177)

2/ That is why planners must be concerned with the demand and supply sides of the equation, as well as resources. (184, p. 1)

with changed assumptions and considerable backward and forward adjustments until, after as many exercises as necessary in iteration and successive approximation, final targets are evolved. (183, p. 133) So frequently is the process of iteration and successive approximation employed that it has been called the essence of target setting. (183, p. 140) The need to harmonize demand, supply and resources implies that regardless of which of these estimates are made the starting point of the target-setting process, first targets derived from the sequence adopted are likely to be tentative and subject to adjustment. Indeed, the choice of one or another estimate is only the beginning of the target-setting process.1/

1/ For example, suppose that in a given country total private consumption was growing at 4.5 per cent annually and (on the assumption that 90 per cent of this increased consumption was of agricultural origin) that total private consumption of agricultural commodities was growing at an annual rate of 4.0 per cent. If population was increasing at an annual rate of 2.5 per cent, the annual per capita growth of total consumption would be about 2 per cent and, of agricultural commodities, about 1.5 per cent. Now suppose an initial growth target of 3 per cent were set for agricultural production. This target would be incompatible with the rates at which total and agricultural consumption were growing since, if the proportions of agricultural imports and exports in relation to domestic production remained unchanged, the available quantity of commodities of agricultural origin per head would increase by only 0.5 per cent per annum. On the assumption that the rates of overall and agricultural consumption had to be maintained, several solutions would be possible, but each would introduce serious problems. Thus, to increase agricultural imports sufficiently to close the gap would disrupt the balance of payments; to let prices for agricultural products rise to equate supply and demand would be politically difficult; or to increase the growth target to, say, 4 per cent would require resources not easily obtainable. Hence, much thought, effort and time would be required to consider available alternatives before appropriate adjustments could be made in the growth targets. (128, pp. 45-6) Indeed, the adjustment process might expose the possiblity that the gap between what was desired and what was possible was so great that it could not be closed within the limits of resources made available for agriculture. In that event, it might be possible to make some adjustment in the overall plan or to increase the resources for agricultural development. (183, p. 139) But the adjustment process would take time and effort!

There are countries which have started the target-setting process by allocating available resources to different subsectors, branches or crops in the agricultural sector.1/ This approach is used where demand is not thought to be as limiting a factor as resources.

In some countries, target-setting starts with a consideration of projected supply.2/ (183, p. 134) This is justified on the ground that past agricultural production provides the best basis for determining whether future growth targets are realistic. (30, pp. 29-30) This approach is also justified on the ground that, despite inadequacies, statistics on past production are likely to be more readily available than data on demand.3/

1/ For example, for Iran's 1962/63-1966/67 Plan, agricultural planners were asked to prepare an agricultural plan which would cost only 80 per cent of the allocation assumed in the plan frame. (30, p. 75)

2/ Thus, in Venezuela, supply projections were assumed to be equal to demand and used as targets; (132, p. 9) and the French Fourth Plan set targets for meats, eggs, wine and vegetable oils at the level of expected production; that for milk at 10 per cent below production; and those for off-farm sales of cereals considerably below production. (170, pp. 46-47)

3/ Cf., 120, p. 57, which contends that starting with projections of the recent trend of output could give a first indication of the possible line of growth for the main crops and livestock products. In principle, this approach is simple to carry out. If one starts with the output of the last few years, then postulates a percentage increase for the plan period which is considered reasonable, this percentage can be fixed as the output target. Thereafter, estimates of key inputs, e.g., fertilizer, improved seeds and pesticides, considered necessary to achieve the increased output, are set as input targets and, finally, domestic funds and foreign exchange are allocated for them. (185, pp. 6-7; 97, p. 61) The problem with this approach is that in a non-competitive economy it ignores demand entirely.

But in most countries, the process by which tentative targets are set begins with demand because it is considered that the best way of increasing welfare is to adjust available resources and supply to the greatest extent possible to meet demand requirements. In this approach, the process begins with calculations of market demand, followed by estimation of resources and production capacities in whatever sequence seems best. For example, Israeli agricultural planners chose to follow calculations of demand by calculations of the resources available to meet market demand, the ability of producers to increase output, and the amount of imports required to supplement domestic production. (105, pp. 177-8) However, the planners who prepared Ceylon's Plan for 1959-68, preferred to follow demand projections with estimates of production possibilities.1/ (157, pp. 274-75)

In calculating demand, it is important to include (a) demand for domestic food supplies (including provisions for nutritional improvement where, as was true in Ghana and Madagascar, improved nutrition is an objective) as well as reserve stocks; (b) requirements of raw materials for domestic industry; and (c) expected exports. (29, p. 19; 120, p. 56) More than one set of projections of domestic demand may have to be made before even a first approximation of the likely level of demand can be estimated for the plan period. For example, during the preparation of Ceylon's Plan for 1959-68, two projections of consumption requirements were made. The first was a low estimate which assumed that per capita domestic consumption would not change during the plan period, but that total domestic consumption would increase 38 per cent to correspond with the expected rise in population during the ten-year Plan period. However, since private per capita consumption in fact was expected to increase by 17 per cent over the period, a second high estimate was made which included both the expected rises in population and per capita consumption during the Plan period. As a first approximation, it was assumed that local production would have to be expanded to meet the low demand estimate, leaving the difference between the low and high estimates to be imported. (157, p. 274)

2. Allocating Resources

Once demand has been (tentatively) determined, the resource problem may be seen as essentially one of selecting among feasible alternatives a pattern of resource use designed to exploit to the

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1/ The methods used to estimate Ceylon's production possibilities were qualitative and practical in that the planners arrived at their estimates by asking agricultural experts whether they thought it was technically feasible to expand production sufficiently to meet their estimates of demand. Despite differences of opinion between planners and agricultural experts about the possibilities of expansion, as well as a lack of data, estimates were made and investment schemes and programs were formulated, often on the basis of "judgments of a fairly arbitrary character." (157, pp. 274-275)

fullest the production possibilities of the available resources to meet demand within the limits of development objectives. (11, p. 177) While the primary development objective in most developing countries is to increase the value of production as much as possible, another objective may have priority. If, for example, the objective is to increase the level of farmers' incomes, or to raise farm incomes in low-income regions, resource allocations must be made in ways consistent with the objective chosen.1/ But whatever the prime objective, resources should be allocated in a way calculated to increase the value of output as much as possible, after adequate provision has been made to achieve the objective.

This makes the principle for allocating scarce resources among the various sectors of an economy, as well as within each sector, simple to state: available resources should be allocated so as to obtain the greatest possible value of production within the limits set by development objectives. How this may be achieved is also easy to state: available resources must be allocated to provide equal marginal productivity to each resource in each use, also after taking due account of development objectives. It follows, therefore, that the question of what quantity of total available resources should be allocated to each sector is inseparable from the question of the returns which these resources can obtain from the different uses to which they can be put within each sector. For agriculture, this means that the quantity of total available resources it can claim on economic grounds depends on the extent to which it can be shown that the returns from these resources when allocated to various uses within the agricultural sector are no lower, for the sector as a whole, than can be obtained from other sectors. (127, pp. 381, 385)

But it is frequently difficult to obtain reliable data on social costs and returns in the agricultural sector. This is so, firstly, because agricultural development is largely a process of creating and building institutions, and investing in such things as research, extension, credit and marketing systems, for all of which it often is very hard to estimate the marginal costs and returns. (186, p. 2) And it is so, secondly, because farmers

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1/ In Israel, the level to which farmers' incomes was to be raised under the agricultural plan was quantified and made into a target. This target served as a yardstick for allocating resources among different farmers to insure that farm incomes rose as required to bring about "equal average income" in different parts of the country and for farms of different structure and type. A complex system of theoretical models of various farm types was prepared, taking account of the situations in different areas, the availability of water, and capital investment to insure that allocations were made in ways which would provide "equal average prospects" to all farmers and areas to obtain a uniform net income. (6, pp. 3-4)

are guided by market prices which frequently are so distorted that the prices do not accurately reflect the true social cost of inputs and the true social value of outputs. Unless "accounting" or "shadow" prices can be calculated which reflect the true social costs (i.e., relative scarcities) of imported and domestically-produced inputs and the true values of outputs, there is a good chance that resources will be wasted by allocation to uses of low productivity. However, at best, the calculation of accounting or shadow prices in agriculture is no easy matter and, at worst, it is extremely difficult.

These considerations have made it impracticable for most poor countries to apply the principle of equal marginal productivity to each resource in each use. In practice, allocations to agriculture often are made on the basis of collective value judgments rather than on the basis of knowledge of true costs and returns in the sector compared with other sectors.

Yet, the severe limitation of resources in most less developed countries is a sufficiently compelling reason for these countries to impose upon themselves the discipline of economic analysis to help make choices among alternatives for achieving development objectives. It is true, of course, that the techniques of economic analysis often must rely on ratios, coefficients and other data of less than desirable reliability, and that in the end there always must be a large element of judgment in the allocation of resources among different uses. (187, p. 147) It is also true that the allocation of resources among crops, institutions and regions is usually more than a technical matter, since political and social, as well as personal and sectional, considerations are bound to enter the process. But far from obviating the need for economic analysis, these considerations make it all the more important that political authorities recognize the extent of the price paid when they select economic alternatives which are less that the best available ones.

The alternatives can take many forms. For example, there may be a question of how many additional resources should be allocated to direct, physical inputs for a given subsector, crop or region, as opposed to indirect measures which would encourage farmers to intensify their production efforts. Or the question may involve the extent to which resources should be spread over the whole country, as opposed to their concentration in relatively favorable areas where rapid development could "spearhead" progress for the entire economy. Or a question may arise about the extent to which resources should be allocated to promote exports as opposed to import substitution. (112, p. 6)

In considering available alternatives, it is important to examine their comparative economic costs. In the case of one commodity, it may be more economic to meet inbalances between supply and demand by imports from another country (or region) and to pay

for them with surpluses of other commodities in which the country (or region) enjoys comparative advantage. (183, p. 139) In the case of another commodity, it may be more economic to expand production.1/

Commodities for which foreign demand exists need to be evaluated to identify those whose export is to be promoted because they would best further the country's development objectives. The commodities selected for this purpose may vary depending on the primary development objective. If the objective is to increase national output and income, which is most frequently the case, computations should be made of the likely real profitability to the nation of each potential export commodity to determine which should be encouraged because its profitability is high and which should be discouraged because its profitability is low.2/

If the primary development objective is other than to maximize the growth of national output or income, e.g., to raise the level of incomes of the poorer farmers in a country or to increase employment in rural areas, commodities which would contribute to the achievement of the "non-growth" objective should first be identified. Once these commodities are identified, however, those which contribute most to social profitability and foreign exchange earnings should be selected in order to insure the most efficient allocation of scarce resources. If the development objective is to increase national output and incomes, commodities for export promotion should also be selected on the basis of the results of these tests.

1/ Cf., for example, 30, pp. 66-68, for an account of how Iranian planners preparing Iran's Third Plan were led to the conclusion that it was more advantageous for Iran to produce the food and fibers the country required than to import them. The conclusion was based on the conviction that the costs of production in Iran were lower than in countries from which Iran would have to import, as well as on the "opportunity costs" of labor if increased domestic production was not taken as an objective.

2/ Similarly, the cost of producing each major commodity grown for domestic consumption should be computed to determine whether it would not be more profitable for the nation to import it than to produce it domestically. Where land, water or other production factors are scarce, these calculations would permit the allocation of resources in such a way as to get the greatest possible return for them.

Since capital and foreign exchange are scarce resources which limit development in most low-income countries, final selection of commodities for export promotion should be made in these countries on the basis of the commodities' ability to (a) provide the highest possible social rates of return on capital investment and (b) earn the largest net amount of foreign exchange for each unit of real domestic resource cost.1/ The first test should be applied to insure that capital invested in producing export commodities yields a rate of return which is as high as possible while satisfying social objectives, or put somewhat differently, which yields a rate of return which is above the minimum required to satisfy social objectives. A convenient way of applying this test is to compare the real internal rates of return for all potential export commodities which have been identified as capable of satisfying social objectives.2/ The second test should be applied to insure that commodities selected for export promotion have domestic resource costs at the prevailing shadow exchange rate3/ which are lower than those of other commodities; or stated from another point of view, commodities selected for export promotion should give promise of earning more foreign exchange per unit of cost than other commodities.4/ The satisfaction of this test insures specialization in commodities which are consistent with the principle of comparative advantage. It also guarantees consumers in the exporting country prices competitive with international prices, thereby contributing to the maximization of their welfare.5/

1/ This implies that where foreign inputs (e.g., imported machinery or fertilizers) are used, their cost must be deducted from the foreign exchange to be realized from the export price for each commodity.

2/ 188 provides detailed information on how to apply this test. Although it is concerned with projects, the techniques described may also be applied to commodities.

3/ This implies that if the exchange rate is undervalued or overvalued, or if a change in the exchange rate is foreseen during the period of a forthcoming plan, this must be taken into account in making the calculations.

4/ Conversely, for agricultural commodities imported, those which should be selected for domestic production should give promise of saving the greatest amount of foreign exchange, per unit of cost.

5/ Cf., 188 for procedures used in applying this test. See, also, 123 for a method of comparing projects and commodities on the basis of the total real resource cost per unit of net foreign exchange earned.

In general, however, the foreign exchange test should be given greater weight than the rate of return on investment test because use of the foreign exchange test precludes the possibility that a country, in pursuit of a high rate of return, might unwittingly be led to promote commodity exports in which it does not have a comparative advantage. Since failure to pay regard to the foreign exchange test could lead to inefficient allocation of internal resources, the foreign exchange test must be considered the basic test to be applied to commodities for export.1/

Where economic analysis is employed in the allocation of resources, whatever the shortcomings of the data and techniques, there is at least recognition of the need for economic impartiality in decisions involving the distribution of scarce resources. And while it is true that economic impartiality may have limitations at times and that judgment based on experience must always have the last word, attempts to quantify costs and benefits of available alternatives can add useful information which can help political authorities make rational decisions about the allocation of resources.

The economic analysis used can take simple or complex forms. In Peru, a relatively simple procedure was adopted in which all agricultural commodities that could be produced in the country (except fish and forestry products) were weighted by value in relation to their probable contribution toward achievement of development objectives. Thirty top-ranking commodities were then compared with the priority commodities tentatively listed in the 1970 agricultural plan. After weighting the commodities on the tentative list in the agricultural plan on the basis of the comparison, a new and final group of 30 commodities was selected for inclusion in the plan. (51, chapter 2, pp. 19-20)

A more inclusive weighting system was adopted in another country to quantify a series of qualitative value judgments. Each major commodity which could be produced in the country was weighted in accordance with its importance in achieving each of several development objectives,2/ which were in turn weighted in accordance

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1/ Thus, if the domestic cost of foreign exchange in terms of a U.S. dollar earned exceeds the shadow rate of exchange for a commodity, it should not be selected for export production even if its rate of return on investment is relatively high, unless there are over-whelming non-economic considerations involved. (188, p. 177)

2/ The objectives included import replacement, increased exports, diversification of agricultural output, reduced unemployment, redistribution of incomes and improved nutrition.

with the priority which each objective was deemed to have in the development plan.1/ In this way, it was possible to quantify the importance of each commodity in achieving each objective and, by weighting the results for each commodity by the wieght assigned to each objective, to determine the importance of each commodity in the development plan. Finally, by assigning the same number of points to each activity required to increase output of each commodity, it was possible to quantify the importance of each activity for increasing the output of each commodity.2/ By multiplying the points accumulated by each activity (i.e., extension, research, etc.) by the weight for each commodity and finally, by the weight given for the priority of each objective in the plan, it was possible to obtain for each activity a quantity which indicated its importance for the development plan. By listing each activity (e.g., extension, research, marketing) by the quantities obtained, the order of importance of each activity for the plan was indicated, and a basis set for the rational allocation of resources.3/ While it was recognized that the assignment of weights "inevitably involves considerable value judgment," it was held that the judgments involved were bound to be made when governments decided to accept or reject a project and, consequently, that "the allocation of points is nothing but a rationalization of these decisions." (186, p. 5)

Israel has used sophisticated mathematical techniques to allocate resources to agriculture which employed linear and nonlinear programming to select the alternatives which promised the highest returns consistent with development objectives. These techniques involved the optimization (i.e., the maximization or minimization) of a defined objective function, subject to various constraints. For example, the maximization of agricultural income or net foreign trade receipts might be the objective, with domestic demand within finite price elasticities the constraint. If export demand or import supply functions were not perfectly elastic, these functions were included in the objective function

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1/ For example, increase exports might have been weighted by 8, diversification of output by 6, and so on. What mattered was the relative weighting rather than the absolute weights given each objective.

2/ For example, assume that 10 points were assigned to each commodity. For livestock production, veterinary services might be considered the most important activity and receive 5 points; research might come next with 3 points, and extension and the provision of watering facilities might receive one point each. For wheat production, out of 10 points, extension might receive 5 points, marketing systems might recieve 3 points and research might receive 2 points.

3/ 186 describes in detail the procedures followed.

to maximize net foreign exchange receipts. Non-linear programming was then used to solve the problems involved before appropriate targets were set. (155, p. 8)

While different methods may be employed to determine the resource allocation pattern for agriculture, they should have in common the capacity to allow comparison of the gains obtainable from one use of a given quantity of resources with the gains obtainable from other uses of the same resources. (112, p. 6) This is an essential condition for the allocation of resources along economically rational lines.

But the choice of a rational resource allocation pattern goes beyond economic considerations. For one thing, the setting of one target almost invariably involves assumptions about policies, projects or programs which differ from the assumptions which apply to another target. While it is easy enough technically to introduce in each of several output projections the policy, project or program assumptions for achieving the target selected, thereby providing a "package" of policies, projects and programs for each target, it frequently is not done. For reasons which do not withstand much scrutiny, some assume that policy considerations, as well as the allocation of resources, should follow rather than be an integral part of the targetting process. 1/ (35, p. 7)

This cannot be desirable because each target requires policies (and perhaps projects and programs) specifically designed to insure its realization. Moreover, if there should be a social or political limit to the degree to which a particular policy or program can be applied, it is essential that this be known before final targets are set. Otherwise, as frequently happens when the need to relate targets and policies (as well as projects and programs) is not met, targets have little chance of being realized. Where social and political bottlenecks put a limit to the degree to which a particular policy or program can be used, it is necessary to set targets at levels below what is economically desirable, although at levels which, taking the political and social considerations into account, yield the highest possible economic returns.

In addition to the need to relate targets and policies, it is important to the construction of an agricultural development plan to relate output targets to inputs. Although substantial increases in the output of agricultural commodities in developing countries usually involve changes in the production process, the accessibility of credit and marketing facilities, inter-commodity price relationships, cost-benefit ratios, tenure conditions, and other factors that control the individual farmer's production

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1/ Since policy usually raises vexing political and social questions, it is understandable why one might be tempted to postpone dealing with them.

decisions, higher than past output also requires the use of additional quantities of inputs like fertilizers, pesticides, improved seeds and water in suitable quantities, and at the right places and times. (97, p. 62) While the total volume or value of inputs going into a country's agricultural sector is often known,1/ the appropriate allocation to individual crops is usually based on estimates from local knowledge. Many attempts have been made to estimate the production equivalent of a particular crop attributable to additional physical inputs. To the extent that these estimates have proved reliable, they have furnished useful yardsticks for allocating resources to specific crops, or regions, localities and farms which specialize in these crops. (189, p. 9)

The use of the "input-output" approach calls, firstly, for the determination of the most profitable combination of inputs, and secondly, for the identification of the most promising production units. The inputs estimated to produce given outputs may then be incorporated in a series of budgets for regions, localities and farms. Each budget is in fact an estimate of costs (inputs) and returns (outputs) of what might happen if a certain course of action were taken. (151; 142, p. 194) By reference to these budgets, resources may be allocated down to the farm level. This technique of "resource budgeting" is particularly desirable where one or more resources are in critically short supply. (187, p. 146) An important part of allocative planning for resources is to insure that adequate supplies of resources in very short supply reach appropriate regions, localities and producing units. This may involve planning for the provision of foreign exchange if production inputs must be imported, or of necessary public investment in transport and warehouse facilities, if these are required to distribute and market the inputs efficiently. (191, p. 6)

Israel, where water is a critical resource, has evolved a system of "program planning" for allocating scarce resources to regions and farms in a way calculated to yield the greatest possible return from available resources. Israeli program planning starts with an estimate of available resources and continues down to the point of selection of producing units. The basic

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1/ For example, studies in many countries have shown that past increases in production of about 2 per cent per year have been brought about by means of an average investment of $900 per hectare of arable land or $3.50 per annum per hectare of agricultural land. (190, p. 100)

assumption underlying the methodology used is that with a fixed amount of resources available for production, the return to all resources will be greatest when the return to the most limiting factor (water) is greatest.1/ (192, p. 44)

In allocating resources, planners must try to ascertain what production possibilities do in fact exist. The planners' task is to allocate resources known to be available and not, as is too often the case, merely to estimate the quantity of resources which would be required to meet a previously-fixed target. When a target has been set with knowledge that the resources required to realize it are not available, the allocation exercise is of little practical value. (193, p. 142) While it is permissible, and even desirable, to set preliminary -- e.g., demand-oriented -- targets before allocating resources, if subsequent study indicates that the preliminary targets cannot be reached with availabe resources, the targets have to be modified. (120, p. 63)

When preliminary targets have been set, planners must check their compatibility. Thus, they must balance the target for overall agricultural consumption with the sum of production which is to be obtained from various crops; they must also balance the provisions made for overall inputs and investments in the agricultural sector with the sum of the inputs and investments allocated to achieve production targets for each agricultural commodity; and they must balance the global value target of agricultural exports and imports with the sum total of the import and export targets for the various products. Depending on the development objectives, planners may also have to balance other targets. For example, if nutritional objectives are part of a plan, the value of the diet obtainable from the planned production for domestic consumption (in terms of calories, proteins, vitamins, etc.) have to be compared with the nutritional target set in the plan.2/ (128, p. 46)

Comparisons of these balances will often reveal incompatibilities which will necessitate revision of some or all targets. But the task of harmonizing the targets is much more than an arithmetical exercise, since to bring the balances into equilibrium with each other may require changes in policies, programs and projects. (128, p. 46) This is turn, may introduce problems which will

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1/ "If all the scarcest factor is applied to enterprises which yield the highest gross profit per unit of that factor, then the total gross profit to that factor will be maximum, the average gross profit per unit of that factor will be maximum, and total gross profit to the combination of factors will be maximum." (192, p. 44)

2/ 14, pp. 564-565 discusses ways of preparing tables to facilitate the calculation of the balances.

influence the setting of final targets. Finally, the targets for the sector as a whole must be made consistent with the regional, subregional and local agricultural targets. This raises special problems to which we now turn.

E. Regional and Local Targets

To be effective, an agricultural plan for a country must have a high degree of specificity to take account of basic variations in conditions and requirements among regions and localities. (194, p. 2) This implies that each geographic unit must have targets tailored to its condition. Such targets are required not only because each area is unique, but also because of the inherent interdependence of inputs in determining outputs. If input and output targets in a national agricultural plan are specified only as aggregates, the interdependence of inputs may be overlooked. Thus the yield from irrigated water supplied in one place, fertilizer in a second, and improved seed in a third will almost certainly be lower than the same quantities of all three inputs applied to the same acreage. (171, p. 32)

Because of the complementarity of inputs, it is important that input and performance targets be given in the plan for each of the smallest feasible geographical units. (171, p. 32) However, the smallest feasible area for which input and output targets should be set varies from country to country. Where, as in India, state governments are responsible for implementing agricultural programs, at least targets at the state level are necessary. Within India's states, targets have been divided into local targets for districts, communities and villages. However, experience indicates that there is a productive limit to the degree of disaggregation. It is a valuable incentive to have regions and localities establish and try to realize their own production targets within a state or national plan. If, however, the local targets must be phased, coordinated or aggregated into a state or national plan, the effort involved may be greater than it is worth. (4, pp. 119-120; 120, p. 59)

For this reason, and also to avoid too circumscribed an approach to the development process, it is undesirable to set separate targets below the level of the largest geographic area where agricultural conditions are relatively homogeneous. For example, where a district includes several villages with essentially similar supply, sale and other marketing conditions, it is unnecessary to have targets for each village if targets are set for the district. (73, p. 579)

It is not easy for central planners to set targets for the various regions and localities within a country. Where farming systems are relatively homogeneous over most of a country, or over sizeable areas, it is possible to select a few kinds of farms as representative of the farms in the area concerned and set targets for a locality or region by multiplying the targets

for the representative farms by the number of such farms in the area. For example, in what was formerly East Pakistan, two or three "average" farms were considered to be adequately descriptive of 80 per cent of the farms in the Province.1/ (46, p. 30) By employing a model commune or district as a base, it was considered feasible to set targets for the different communes and districts in the Province. (46, p. 193) In Israel, also, local and regional targets were set on the basis of four main farm types: a dairy farm, a citrus farm, a field-crop farm and, more recently, a farm which specialized in producing agricultural products for export. From these model farms, secondary farm types were derived for different regions. With these derived model farms as the basis, targets were set for the different regions which were in harmony with the overall targets for the national agricultural plan. (6, p. 4)

However, for most countries, the diversity of farming systems makes it impossible to find a few "average" farms which can be considered as representative for substantial geographical areas. Moreover, apparent similarities among regions may be misleading. Thus, two regions with the same amount of production may still differ substantially in economic performance. For example, if there are important differences in the distribution of wealth in the two regions, their propensities to use labor-intensive or land-intensive methods, or to save, invest or use capital may differ. If the distribution of income in one region conforms to the normal or bell-shaped curve, the "average" farmer could be considered to be a representative producer for the region. But if the distribution of income in the other region were heavily-skewed, the "average" farmer (whether the mean, the median or the mode) would not be a representative producer because most of the output would not have been produced by average farmers, but by the few farmers who were wealthier than the average. And, of course, the "average" farmer in one region would differ from the "average" farmer in the other. (62, p. xxi) Small wonder, therefore, that there is increasing distrust of the concept of an average or representative farm for setting targets. (62, p. xxi)

An agricultural plan with targets for an entire country formulated either implicitly or explicitly on the basis of an "average" situation in an "average" region, with similar targets, number or kinds of projects, work patterns or allocations of

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1/ It was found that a farm which had 0.8 hectares of main-season rice, 0.3 hectares of jute, 0.1 hectares of vegetables for home consumption, and possibly 0.4 hectares of second-season rice was reasonably representative of the farms in most of East Pakistan, despite the fact that the Province had a rural population of no less than 55 million persons. Moreover, it was found that farms with land and irrigation facilities substantially greater or less than the representative farm engaged in operations which were essentially similar to the representative farm. (46, p. 30)

funds for every region and subregion, may prove unsuitable or inapplicable in varying degrees for particular areas in most countries. This approach to sector planning, aside from producing unrealistic targets and other errors of commission, may also lead to serious errors of omission. For example, when it was used in India, the Agricultural Administration Committee in that country reported that in one state with 35,000 waterlogged acres, no project or other provision for dealing with the problem was even included in the agricultural plan. (73, p. 565)

Indeed, there is a question whether it is even possible to set realistic regional and local input and output targets by setting national targets and disaggregating them without first determining for each region and locality the precise conditions which cultivators face, and their capacities to utilize inputs and increase production. National targets (whether derived from past production records for the country as a whole, prospective market demand estimated on the basis of expected population, or an assumed increase in per capita income and income elasticities for various products), when set in the center on the basis of national objectives, tend to apply to suitable and unsuitable regional and local soil indiscriminately. (39, p. 9) As an example, African farmers have been urged to grow cotton to meet national targets when maize is more profitable to them, and where planting of cotton at the proper time might risk too late sowing for their vital food crop. (182, p. 81) When officials tell farmers to grow X acres of a crop merely because a government has set a target for that crop, it almost always indicates a lack of understanding of the difficulties that farmers have in adjusting their normal crop patterns, given their limited financial, labor and other resources. (182, p. 67) It is not surprising, therefore, that where agricultural planning for regions and subregions is based on the disaggregation of national targets, without adequate account taken of regional or local conditions and attitudes, great discrepancies may occur between expectation and achievement.

The failure of targets formulated in the center to take account of regional and local conditions has led to the suggestion that production targets be set "from the village upwards instead of the country downwards." (195, p. 82) Advocates of this approach contend that the only sure way of dovetailing national targets with regional and local capacities and requirements is to derive sector targets by aggregating regional or local targets rather than by disaggregating targets framed at the national level. They hold that only when each region and locality has set input and output targets designed to take adequate account of the physical resources, with their limitations, and the human resources, with their dispositions and motivations in each region and locality; and when these regional and local targets become the basis for framing the targets for the entire sector, can it be said that a sector target for a country's agriculture has been formulated realistically. (73, pp. 564, 566)

Clearly, however, a nation's sector targets for agriculture must be more than the sum of local or regional targets. If regional or local targets for agriculture are set without regard for the general framework provided by national development objectives or resources, they may be inconsistent with national development objectives; just as sector targets set without regard for regional and local conditions may be inconsistent with regional and local capabilities or aspirations.

Target setting for agriculture must, therefore, be seen as a two-way process involving planning from the bottom up as well as from the top down in which sector objectives and targets help determine, and are themselves at least partly determined by, regional and local targets. To achieve this result necessarily requires an upward and downward iterative process by which, through successive approximations, arrived at by procedures which oscillate between the national and regional (and local) levels, regional, local and sector targets are harmonized. It is only by such a process of mutual interaction that sector targets can be set which are sufficiently realistic to meet both national aspirations and the needs of each region and locality. (73, pp. 566-7)

But harmonization does not mean that sector input and output targets must be totals of the input and output targets of all regions or localities. Where national objectives require that national targets be set for some commodities, it may be necessary to set targets for these commodities in regions and localities where they can be, or are, produced; but where national targets have not been set for commodities, there normally is no need for regional or local targets, except insofar as these areas may wish to set them for their own purposes. For example, in Israel, where certain crops are subject to marketing restrictions, production quotas are assigned to the regions; but for crops without such restrictions, regions are free to produce as much as they wish within the priorities for development of the various agricultural subsectors and branches set forth in the national agricultural plan. (40, p. 507) Whether or not the regions set production targets for unrestricted crops is for them to determine. Such targets may be set by regions because they may be considered useful as guides for producers in the region.

Regional and local targets which take account of the conditions, capacities and aspirations in the areas concerned, can be set by the center after consultations with regional and local authorities. In principle, this is done in a series of steps of which the following is illustrative:

(1) The central planners set national production targets which are desirable from the national point of view.

(2) These targets are broken down by major agricultural areas in consultation with agricultural planners from the various areas.

(3) The planners from each area indicate the production targets which farmers in the area can be expected to achieve,

and the socio-economic conditions which must be established to enable and motivate the farmers to realize the targets.1/

(4) These targets for the various agricultural areas are aggregated to yield an estimate of national agricultural production from the point of view of the various areas in the country.

(5) If the production targets of the various areas deviate widely from the nationally desirable production targets, a 'feedback' procedure is applied to bring about a reconciliation of national targets and area targets by readjusting national and/or area targets and, if necessary, farm production budgets and plans. This may also involve certain adjustments in the environmental conditions in the various farming areas and in national economic and agricultural policies.

(6) After discussions between the planners at the national and regional and/or local levels, final national, regional and local targets are fixed. (39, pp. 7-8)

Some countries, including India and Sri Lanka, have made an attempt at such two-way planning. (189, p. 9) But some have gone further than others to achieve adequate interaction. Among the mixed economy countries, Israel has probably had the greatest success in this respect. But in most mixed-economy countries, there has been a failure to recognize that the feed-back process is essential for setting viable targets and achieving them; as well as a failure to understand that target-setting requires active cooperation between local planners and farmers, as well as among planners at all levels from the local farming areas up to the national planning agency and back down to the local level. (39, p. 9)

Among the socialized countries, the U.S.S.R., and the Peoples Republic of China have followed most closely the process of planning "from the bottom up and from the top down."2/ The procedure

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1/ Implicit in this part of the exercise is a typical farm budget or farm plan applicable to the area concerned which includes estimates of costs (inputs) and returns (outputs) of what may happen on the farms in the area if a certain course of action were initiated. The budget or plan would have been prepared with the active participation of farmers in the area to make sure that it is consistent with farmers' objectives and sense of what will work for them. (151, p. 194)

2/ In the U.S.S.R., state and collective farms prepare tentative plans with targets which are combined into district, republic and, ultimately, nation-wide plans and targets. After review and adjustment, plans and targets move downward in the organizational hierarchy. Since targets for only major crops to be sold to the State are now set at the center, the regional and local plans have greater latitude than formerly in setting targets for commodities not sold to the State. (120, p. 59)

followed in China is particularly illuminating. The process begins in every commune after each mid-year with a review of the previous year's performance and the proposed targets for the next year. The commune's proposed targets, which largely reflect its own needs and priorities, and what it considers to be the best use of available manpower and financial resources, are sent to the county in which it is located. After discussions between representatives of the county and the communes, the county passes on to the province in which it is located the county's targets for production and inputs (e.g., fertilizer and machinery). The province then submits the targets to the Central Planning Commission. At the annual meeting between provincial and Planning Commission representatives, the adequacy of the targets for all major crops is reviewed. Attempts are made to have provinces with deficits in grains, sugar, cotton, vegetable oils, etc., increase production targets, and adjustments are made in the targets. The adjusted provincial targets are then disaggregated and transmitted to the counties and communes and a second round of meetings are held between provincial and county representatives, and county and communal representatives before the targets are made firm. 1/ (82, p. 6)

It may seem obvious to say that those responsible for achieving production targets should have a voice in setting them, but the lack of adequate consultation with those most concerned with implementation of targets is so common that the point needs stressing. Not only are producers who help set their own targets likely to be more committed to their realization than to targets set by outsiders; the targets which producers themselves set may well turn out, if conditions are made propitious, to be higher than those set by outsiders since producers are almost always better acquainted than others with their own capabilities and limitations. But whether the targets are higher or lower than those set by outsiders, they are likely to be more realistic. 2/

1/ The exercise is governed by two principles. The first, "leaving leeway," implies the need for maximum flexibility in setting targets; the second, "combatting egotism," requires everyone to take into account others' needs. (82, p. 6)

2/ In Tanzania, the Government has consistently held to the view that the development of a country is brought about by its people, that for a plan to be significant requires that the people participate in the planning process, and that no one is better equipped than they to know their own problems. The TANU (Government Party) Guidelines (generally referred to as Mwongozo) admonish members of the Party that it is their duty "not to urge the people to implement plans which have been decided upon by a few experts and leaders. The duty of... [the] Party is to insure that the leaders and experts implement the plans that have been agreed upon by the people themselves."

Since people are likely to be most committed to targets they have set themselves, the ideal arrangement is for central authorities to abstain from modifying regional and local targets whenever possible. But since this is likely to be difficult or impossible in most instances, the applicable principle is that direction and control from above should be reduced to the minimum required to harmonize regional, local and farm targets with national objectives.

VIII. SELECTING AGRICULTURAL DEVELOPMENT STRATEGIES

A. Why a Strategy is Needed

To achieve an objective, a target, or both, a variety of policies may be needed. The range of potentially useful policies for this purpose is very wide, covering fields as diverse as manpower, resources, production, investment, prices, taxation, marketing, credit, research, training, extension, nutrition and settlement. Policies adopted to achieve a specific objective or target may require that activities be carried out in a variety of ways, together or separately, differently in different regions of a country -- or even differently for different farmers in the same region. (196, p. 2) Some policies can stand alone;1/ others are complementary or mutually reinforcing, and have to be used in combination to give the best results;2/ still others are mutually exclusive.3/ Some policies are slow-acting, while others have an almost immediate effect. Some differ in the extent of their demands on scarce resources, and vary in their capacity to utilize the more abundant ones. Some policies have a direct impact on production, while others exert their effect indirectly by changing the environment in which farmers make investment and production decisions. (120, p. 72)

Because of the complexities involved, policy-making is a difficult task. Moreover, because the realization of an objective or a target depends on the policies adopted, more than on any other element in the planning process, policy-making is at the heart of that process. (14, p. 5554) Effective policy-making requires, first, the identification of relevant and potentially desirable policies for achieving an objective or a target and, second, the selection from these policies of those which are best for the purpose. (196, p. 2)

1/ E.g., a policy for improving marketing laws.

2/ E.g., policies for irrigation, fertilizers and extenstion services associated with a high yielding varieties (HYV) seed program.

3/ E.g., irrigation and mechanization policies might be mutually exclusive if both required heavy foreign exchange expenditures which together exceeded a country's resources.

B. What is a Strategy?

To facilitate the identification of relevant policy alternatives and the choice of those likely to be most effective, requires a frame of reference. This is what a development strategy provides. By laying out the broad approach or general direction to be taken to achieve a specific objective or target, a strategy allows planners to choose from a variety of potentially useable policies, projects, programs and other measures and activities, those which are best suited to that approach and to relate them to each other in an integrated network.

More than this, a strategy is a convenient means, because it is intermediate between an objective and the policies required to achieve it, for testing whether all the policies, programs and other measures and activities needed to realize an objective are being or can be adopted. For example, if a high yielding varieties (HYV) strategy is adopted, the strategy provides a convenient reference point against which to check the variety of policies, etc., needed to insure that adequate amounts of fertilizer, pesticides, water, credit, technical information and other inputs are made available to farmers at the right time and place. A well-considered strategy could reveal that, because of farmers' attitudes or other factors, policies for application of government or institutional funds and the use of a wide array of incentives ranging, let us say, from subsidized inputs to high output prices, could not achieve an objective to increase production in the absence of structural reforms. This was found to be the situation in Indian agriculture in the early and middle 1960's (Economic and Political Weekly, Bombay, India, Vol. 8, No. 36, Sept. 8, 1972, p. 1620). A carefully chosen strategy can also help identify constraints, e.g., a shortage of managerial and technical personnel and lack of land clearing capacity, which have to be removed before an objective can be achieved. This was the situation in Malaysia, in connection with the development program of the Federal Land Development Authority.

A strategy can also be considered as a means of selecting elements or factors on which to concentrate in developing the agricultural sector. These elements involve choices among different technologies, spatial arrangements, time horizons, production mixes and human groupings, as well as the emphasis and sequence to be given to each element in achieving a given objective or target.

Viewed in this way, a development strategy for agriculture may be seen as a framework for a consistent set of policies, measures and activities within defined constraints which together constitute an organized thrust in specified directions toward

fulfilling a particular objective or target.1/ For example, if the promotion of agricultural exports is the strategy selected to further an objective of increased production, the price, production, investment, credit and other relevant policies must constitute a consistent group of measures calculated to give maximum effect to the export promotion strategy in achieving the objective of increased agricultural production.

C. Theory vs. Practice

At least, that is the theory. In practice, however, one frequently finds policies in effect without reference to a clearly defined development strategy, as much in national macroeconomic as in agricultural planning. For example, India's Professor Gadgil, later Deputy Chairman of the Planning Commission, observed in 1966 that "total absence of a policy frame is the most outstanding feature of the planned Indian economy."2/ Absence of a "policy frame" was especially apparent in India's agricultural planning. One can only speculate that if this was true in India, which has exceptionally well-trained planners, how much more it was likely to be true in countries less well-endowed.

Many less developed countries pay scant attention to the development strategies required to achieve their agricultural objectives. Typical of this situation, a Joint Session of the Near East Commission on Agricultural Planning and the Near East Commission on Agricultural Statistics reported in May, 1972, that "there was no specific agricultural development strategy to achieve the rural employment goals stated in the national development plans" of the Near East. (197, p. 17) In contrast, some countries seem to have a shotgun approach, with policies headed in different, sometimes opposite, directions. For example, a report of a

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1/ The adoption of a strategy to achieve a given objective or target does not imply that everything outside the strategy will be ignored -- only that the strategy will be emphasized. Thus, in Bangladesh, the adoption of a two-fold strategy for multiple cropping and increased yield rates for rice production did not mean that the production of jute, tobacco, sugarcane, cotton, potatoes, oilseeds, pulses, tea and other crops would get no attention, but that the production of rice would get the greatest attention.

2/ Cited by B.H. Minhas, "Where Planning Went Wrong," The Hindustan Times (India), May 10, 1974.

research group of the Universities of Reading (England) and Ghana reported that Ghana's objectives for "increasing food production and improving the balance of payments are to be achieved primarily by a vigorous agricultural policy1/ so mounted as to achieve other rural development objectives at the same time -- better inter-regional balance, as well as higher standards of material living in health, housing, roads, electricity, education, etc." (193, p. 21) Senegal, while trying to maintain production of its major crop, groundnuts, at high levels, has pursued a strategy of diversification, aimed first at the substitution of home-grown products for imports of staple foods and cotton, and second, at a further diversification of exports. (199, p. 93) Still other countries, while claiming a strategy, do not make the choice explicit, with the consequence that they may fail to adopt all the policies required to make the strategy effective. Thus, in Tanzania, which had adopted an agricultural strategy designed to increase farmers' productivity, the Government provided farmers with a subsidy to promote the use of fertilizer, but failed to alter conditions enough for farmers to adopt the cultivation intensification procedures required to achieve increased output with the subsidized fertilizer. (200, p. 70)

Part of the problem may be that many agricultural plans fail to distinguish among objectives, strategies and policies. This has already been mentioned in chapter 5. The point worth noting here is that when an objective, which is an end, is taken to be the same as a strategy, i.e., a means for achieving the end, the need for a unifying framework for the policies required to achieve the objective or target is likely to be overlooked; and when a policy is taken as a strategy, it is likely to be too narrowly defined to provide a unifying framework for all the policies required.

An adequately defined strategy allows resources to be combined in specific ways to achieve an agricultural development objective or target. Clear definition is important because different strategies use resources in different ways. Thus, the way resources are used to achieve a development objective will be different with a high yielding varieties (HYV) strategy, which relies on a discrete technological jump, than with a strategy which relies on a gradual improvement and intensification in the use of traditional agricultural inputs. The HYV strategy requires a series of policies which lead to the concentrated application of improved varieties of seed, fertilizer, pesticides and other inputs, many imported, at the right times in areas with assured rainfall or irrigation to insure success; while the "gradualist"

1/ As indicated in the next paragraph, plans frequently fail to distinguish among objectives, strategies and policies. As the footnoted word above shows, even "experts" sometimes confuse a strategy with a policy.

strategy may require land reform, raising the general education level, extension and credit programs, as well as less capital-intensive technology, and hence less foreign exchange inputs, than the HYV strategy.

D. Types of Strategies

1. Concentration vs. Dispersion of Resources

While different strategies may be used to achieve the same objective, a given objective often requires one kind of strategy instead of another. Thus, experience shows that if the objective is greater equality in the distribution of income, a strategy involving agrarian reform produces better results than one which concentrates on new agricultural services. (201, p. 10) This is because farmers respond better to attempts to improve agricultural productivity when they have an adequate stake in the land they work. In contrast, if the objective is a rapid increase in agricultural output without regard to improved income distribution or promotion of employment, a HYV strategy is likely to be more effective than a gradualist strategy. There are several reasons for this. First, the HYV strategy can be implemented quickly and with small expenditures of time and money for development since, after local testing of the HYV seed, seed can be imported for distribution to farmers;1/ second, the HYV strategy allows two, three or even four crops per year to be grown on the same land when water is adequate; (202, pp. 10-11; 203, p. 11) and third, it permits resources to be concentrated among farmer groups with the greatest propensity to adopt innovations, who are usually found in a few regions with high production potentialities.2/ In contrast, the gradualist strategy spreads resources

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1/ India, Pakistan and Turkey all took advantage of this by importing seed from Mexico. (203, p. 9)

2/ For example, in India, the HYV strategy was designed to ration scarce inputs on a selected and restricted regional basis where soil, climate and irrigation conditions were propitious for intensive use of inputs to maximize output at greatest profit and least risk. (47, p. 208) This approach was justified on the grounds that the high yielding varieties of wheat required a new technology with an entirely different set of husbandry practices than other seeds. Thus, if farmers were to realize the genetic potential of the seeds, they might need to increase the plant population, change the time of planting or the depth of seeding. They also had to irrigate more frequently than with other seed, and with more precision; use fertilizer in large quantities; and weed carefully to prevent waste of fertilizer on weeds. (203, p. 10) Not all farmers in the country were equally able to carry out HYV strategy.

over wide areas to assure that increased output is accompanied by an adequate return for most farmers without reference to their innovative propensities.

The record in India, Mexico and elsewhere indicates that concentration of resources may be an acceptable strategy where increases in output are readily obtainable if the objective is to increase production as quickly as possible. But the price for rapid increases in output may be high. For example, the HYV strategy may require a change in the scale of agriculture with attendant displacement of farm tenants and workers which can lead to a conflict between increased output and social justice objectives. This happened in India. In addition, subsidies for inputs and price supports in connection with India's HYV strategy for agriculture led farmers to reduce the production of pulses, an important source of protein.1/ The same thing happened in the Far East. The decline in the production is likely to have a serious effect on poor consumers who rely on pulses as a cheap source of protein. (166, p. 25) In Mexico, the concentration of resources on the larger, commercial farmers included substantial economic incentives for increasing production which greatly increased the public costs of carrying out the HYV strategy. Moreover, a study of the results obtained in the agricultural sector revealed that large farmers were less efficient in the use of capital than small farmers, since the larger farmers used a greater proportion of the capital invested in agriculture than they contributed to output, while the relative contribution of small farmers exceeded their relative capital investments. 2/ (204, pp. 34, 38)

Because of the possibly high social costs of a strategy which concentrates resources, there is something to be said for a strategy of gradualism. Experience demonstrates that the

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1/ Between 1971 and 1972, per capita wheat production in India increased 25%, while the production of pulses dropped 38% (Cooley, John K., Christian Science Monitor. April 29, 1974, p. F6).

2/ It is interesting to compare the Mexican strategy with that of Israel, Japan, South Korea, Singapore and Taiwan, all of which adopted a strategy for increasing the production of export crops which stressed labor and skill-intensive products. The strategies of all five countries (other than Mexico) coordinated major investments for raising the general educational level of rural people with subsequent creation of productive employment opportunities in rural areas. (74, p. 41)

gradualist approach may be the most stable and reliable way to develop agriculture in poor countries, although it may not be the quickest way.1/ Indeed, the less urgent the need for short-term increases in output, the greater the benefits of a strategy which calls for combining limited amounts of capital with increased use of surplus labor to gradually improve production methods on as large a proportion of the farmers in a country as possible. In Taiwan, which chose the gradualist strategy, the scale of agriculture was stabilized by a land reform program, yields were increased, although more slowly than with the HYV strategy in India, and the benefits of increased output were widely distributed among the country's farmers. (205, pp. 44-45) The gradualist approach not only has shown that it can increase output; it can provide more employment and a more equitable distribution of incomes than a strategy based on concentration of resources.2/ (206, p. 9) In contrast, where resources have been concentrated on the larger farmers, who generally are the most apt at adopting innovations, mechanization of agriculture may be promoted, thus accentuating the employment problem and the maldistribution of rural incomes. This has happened in Pakistan. (207, p. 21)

2. Short-term vs. Long-term Strategies

It is also essential to consider the time horizon for a strategy before it is adopted. Some strategies require a longer time to carry out than others. It is, therefore, desirable to ascertain how long it is likely to be before a given strategy will produce results. (20, pp. 25-26) If results are wanted in a short time, it is important to avoid a strategy which relies on major reforms in technology, administration or organization. Long lead times are typical in agriculture and careful evaluation of potential strategies is essential to separate long-term from short-term strategies.

1/ A study of the gradualist approach in Israel, Japan, South Korea, Singapore and Taiwan found that after an initial period of slow growth lasting about a decade, growth becomes more rapid. The author of the study concluded that "Once the slower growth phase is passed, the transition to a stage of relatively high development can be accomplished in short order." (74, p. 44)

2/ A study of Taiwan's (and Japan's) agricultural progress reveals how carefully human skills and physical and institutional structures were built up over time. "Their progress," writes one experienced observer, "was by no means like a one-day hike to the mountain top. The same careful persistence in three respects - development of land, institutions and skill - is being shown in China since 1950. They, too, are beginning to reap the reward of their wise persistence." (208, p. 9)

As in the case of objectives, a long-term strategy to achieve a given objective may conflict with a short-term strategy to achieve the same objective. For instance, expansion of irrigation by flooding may be a sensible strategy for increasing output during the period of a five-year plan. From a longer point of view, however, the cost of land lost because of salinization may make it preferable to forego the short-run benefits of the flooding strategy and adopt a longer-run strategy of drainage and desalinization, as was done in Pakistan.

As has been implied in the previous section, the choice between the concentration of resources and the gradualist strategies raises the question of whether the diversion of large resources to a specific area or crop, as in an HYV program, to obtain a rapid increase in the output of grains, is worth the expenditure in people and money if the strategy yields a lower rate of social return than the gradualist strategy over a long period of time. However, this does not mean that the gradualist strategy always has the edge. Of course, it is desirable to set in motion a long-term process of sustained increase in the overall productive capacity of the agricultural sector. But a gradualist strategy may involve long-term research on traditional crops and the execution of such projects as drainage, irrigation, flood control, land development and settlement, plant and animal breeding, education, improvement of marketing and establishment or improvement of credit and agrarian institutions, all of which have a long gestation period. In these circumstances, it is understandable why some governments feel impelled to emphasize concentration of resources strategies, like an HYV program, with their promise of quick increases in output.

In practice, however, most developing countries compromise with strategies which embody both long-term and short-term programs, thereby attempting to meet immediate as well as longer-term objectives. For example, in its First Five-Year Plan for 1973-78, Bangladesh adopted two broad strategies to achieve its objectives of self-sufficiency in foodgrains, and reduced unemployment and under-employment: first, an increase in cropped area through multiple cropping made possible by low-cost, labor-intensive irrigation projects, and second, the introduction of high yielding varieties of seeds in irrigated areas. The longer-term strategy involves expansion of the area under irrigation during the Plan period according to a fixed time table, while the short-term strategy involves the concentration of physical inputs, credit and technical information to existing irrigated areas. (78)

3. Resource Concentration for Small Farmers

The question of resource concentration also has arisen in dealing with the problem of small-holder development. Here, two principal strategies have emerged. The first concentrates on a cash crop of high potential as a focal point for rural development.

The Kenya small-holder tea project is an example. It provided credit, extension services, tea-processing factories and access roads for small-holders in the tea-growing areas. While the cash crop strategy has the advantage of spreading the benefits of development widely among small farmers, it has limited scope where market prospects, climate or soil conditions are not propitious.

The second strategy concentrates on small-holders in a geographic area which has both high potential and manageable size. This strategy, while seeking to increase agricultural productivity among small farmers in a selected area by supporting production for subsistence and marketable surpluses, may also include such activities as soil conservation, the improvement of local marketing facilities, the provision of agricultural inputs, road construction and social services. Examples of this strategy can be found in the Lilongwe and Karonga projects in Malawi, the Wolamo project in Ethiopia and the Casamance project in Senegal. A variant of this strategy calls for the selection of a village or other sub-regional area in each of a series of regions as a model for the introduction of a package of improved production inputs and techniques. This strategy was employed in India's Intensive Agricultural Development Program during the Third Plan period. (4, pp. 145-146) While it may produce greater yields by concentrating scarce resources in specific areas, it may discriminate against areas not included in the program by drawing resources away from them. (206, p. 45)

4. Other Strategies

a. Import Substitution

Besides the strategies already discussed, a variety of others have been used. Until recently, the major objective of agricultural planning in most developing countries was to increase production, either to make a country self-sufficient in certain agricultural commodities, to improve the balance of payments, or both. Thus, the strategy adopted in Lebanon's Six-Year Plan for Economic Development (1972-77) for increasing agricultural production was to concentrate on food crops for domestic consumption, thereby also reducing the deficit in the country's agricultural trade. (179, p. 6) In the 1960's, Sri Lanka (then Ceylon) placed great emphasis on a strategy of import substitution through expansion of its domestic food crop production, both to help make the country self-sufficient in its basic foods and to reduce imports.

b. Traditional Exports

Some countries have thought it best to try to increase agricultural output with a strategy for promoting such traditional exports as bananas, coffee, cocoa, sugar, tea or rubber. This strategy has sometimes included policies for increasing income from traditional exports through more efficient marketing arrangements or through agreements between importing and exporting countries

designed to get a better balance between supply and demand, e.g., through international coffee agreements or U.S. sugar import agreements. (184, pp. 4-5) Export promotion of agricultural products generally involves commercial and capital-intensive activities, and requires a certain degree of sophistication about standards, packing, handling, etc., and a certain minimum scale of operations. (209, pp. 257-373) Lacking these, an export promotion strategy must take into account that it is generally applicable only to advanced farmers and that peasant farmers are likely to be excluded unless they can work through cooperatives or marketing boards, e.g., as in the case of tea marketing in Kenya.1/ (206, p. 45; 117, p. 13) Unless this is possible, an export promotion strategy may not be appropriate if improved income distribution is a major objective.

c. Agricultural Diversification

Some countries, dependent on one or two export crops for a large proportion of their export earnings, have sought greater security with a strategy of agricultural diversification. During its Second Five-Year Plan, Thailand achieved much success with this strategy in decreasing its dependence on rice. Corn and sugarcane became major crops, while cassava root and various kinds of beans also increased their shares in agricultural output at the expense of the traditional rice. While rice has remained by far the largest crop, output has not increased since 1966. (211, p. 266)

Taiwan and Mexico, two countries with outstanding records for agricultural growth, also illustrate the effectiveness of a diversification strategy. In 1950, sugar accounted for almost all of Taiwan's agricultural exports and for 80 per cent of its total exports. By 1967, sugar exports, though still large in absolute terms, constituted only 7 per cent of total exports, while exports of bananas, canned fruits and vegetables each exceeded sugar's proportion in total exports. Mexican agriculture diversified rapidly in the 1960's, after the country achieved self-sufficiency in wheat. The Mexican diversification strategy led to a shift in resources to the production of corn, sorghum and soybeans to expand the grain-based poultry and livestock industries. Corn production increased by almost 50 per cent between 1963 and 1968, while output of sorghum and soybeans multiplied several times. The production of processed fruits and vegetables, primarily for export to the United States during that country's off-season, also expanded rapidly.2/ (212, pp. 162-163)

1/ A government can, as a part of the strategy, establish domestic marketing standards with grades which gradually get peasant farmers accustomed to improving the quality of the products they grow. (210, p. 8)

2/ However, whereas Taiwan's diversification strategy was directed toward small farmers throughout the country, who were able to employ labor-using techniques in production, Mexico's strategy by-passed the small, labor-intensive producers throughout the country and encouraged production primarily through large farms. As a result, while production increases have

However, the strategy appropriate for one country may not be appropriate for another. In general, however, in small countries the best strategy is export oriented; in large countries, strategy can be aimed at satisfying domestic demand, especially when an equitable pattern of development generates a mass market. (74, p. 44)

E. Who Selects Agricultural Strategies

The discussion of strategies should make clear that the choice of strategy, like the choice of a development objective, involves critical decisions about which groups are likely to benefit from development efforts, and which are not. A strategy, like the HYV approach, may be "neutral" in theory with regard to farming scale or location, in the sense that even a small-holder located anywhere can apply the package of inputs required to obtain profitable returns. But in practice neutrality breaks down quickly because the control of irrigation water by larger (and wealthier) farmers and their better access to credit, inputs and officials make it much easier for them than for poorer farmers to apply a strategy like an HYV program and to benefit from it. (210, p. A-141) Because of this, the selection of a strategy, like the selection of an objective, is more than a technical matter. Almost invariably, some groups of farmers -- usually the larger or wealthier ones -- have tended to benefit more from development efforts than others. It is evident, therefore, that although a strategy has technical content and implications which planners and other technicians are qualified to deal with, the political and social aspects of a strategy are even more important. Consequently, it is the political leadership, assisted by planners and other technicians, which has the ultimate obligation and responsibility for selecting from the available alternatives the development strategy to be followed.

F. Constraints on the Choice of a Strategy

1. Need for a Systematic Analysis

Since ideals of social equity and economic efficiency often conflict, at least within a given time period, development strategy for the agricultural sector must not only aim at an acceptable compromise between conflicting social and economic aims, but must also seek to obtain efficient use of resources that are scarcest. To achieve these aims requires a systematic analysis of feasible alternative ways of reaching an objective. In Malaysia, for example, such an analysis determined (a) the real but limited prospects for the diversification of crops grown primarily for domestic consumption, (b) small-holders' major problems and the measures required

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been widely dispersed in Taiwan, in Mexico four-fifths of the production increase has been coming from the less than five per cent of the farms employing only one-sixth of the farm labor force. (85, p. 7)

to raise rural incomes, (c) the need to reconsider the government's rice policy, (d) the importance of maintaining the strength of the import sector, (e) the increased contribution to overall development which improved utilization of forest resources would make possible, (f) the possibilities of developing fisheries on the east coast of West Malaysia, and (g) the development problems and prospects of Sabah and Sarawak.

A good analysis requires the collection and consideration of as much information as possible about the costs, benefits, advantages and disadvantages of each alternative, as well as a determination of the relative abundance and scarcity of major resources.1/ The information which needs to be gathered will depend, first, on how big an effort is to be made in agriculture and, second, on the objectives to be achieved, e.g., the extent to which the objective is to improve employment and incomes for small farmers and farm workers as compared to the expansion of production. Using all available information, the analysis seeks to estimate the likely effectiveness of each strategy to achieve the selected objective, and to identify the one with the greatest promise. (214, p. 915)

While the benefits and advantages of a possible strategy are generally easy to discuss, its full costs and disadvantages are frequently less apparent. One reason for this is that the nature of the constraints for a given strategy may vary greatly from one country to another. Another reason to identify constraints is that it is first necessary to adjust a development strategy to the special situation in a country before all the costs and disadvantages can be assessed. Planners frequently fail to reconnize that substantial differences in constraints from country to country make it essential to identify specific constraints in specific environments rather than to look for a strategy that will be suitable in a wide range of diverse conditions. Zaire provides a good example of why specificity is essential. Because the overall man/land ratio is extremely low in Zaire, a cursory review might make it seem most desirable to increase agricultural production by expanding cultivated areas. But more careful study by a World Bank mission made it clear that labor constraints militate against this. Nor did mechanization offer an easy way around Zaire's labor constraints because uncertainties exist about soil qualities and the possible impact of mechanization on them. Moreover, land tenure arrangements and the attitudes of the people preclude large resettlement activities, at least in the short run.

1/ For example, an analysis which a World Bank team made for Sri Lanka, identified foreign exchange and investment capital and, to a lesser extent, managerial skills as relatively scarce resources; and unskilled and educated manpower as relatively abundant resources, with considerable unutilized potential in natural resources.

This left raising present crop yields as the most promising approach as an initial strategy for increasing output, especially since present yields are below previous levels. The World Bank mission's examination of the possibilities inherent in this approach revealed that production could be increased quickly in this way. Once this strategy was seen as the most desirable one, the measures and policies to be adopted as part of the strategy became apparent. The key element for raising yields was seen to be the need to restore the quality of planting materials. This called for policies and a concerted program to encourage the production, multiplication and distribution of improved seeds. With this as the underlying activity, other policies and measures which could have effects quickly were also recommended.

In summary, to choose an appropriate strategy requires a systematic analysis of feasible alternative ways of achieiving a desired objective which includes, among other things, a careful consideration of the material, technological, spatial, production, time and human constraints. While the actual constraints encountered on the use of any strategy depend on the situation in a country at a given time, there are generalizations which are applicable for a number of constraints.

2. Resource Constraints

One of these is imposed by the natural conditions in a country. Climate, endemic disease and the scarcity of water are examples of natural conditions which set limits on agricultural strategies. Agricultural strategy in India must take cognizance of the monsoons, just as agricultural strategy in Tanzania must take account of sleeping sickness borne by the tse-tse fly; and countries where water is scarce must devise strategies which make the most of available supplies, as for example in Saudi Arabia and Israel, where agricultural strategy calls for the concentration of scarce water on high value crops. 1/ (197, p. 6)

Recognition of the resource constraints on the choice of an agricultural strategy may spell the difference between success and failure in achieving targets and objectives. In Kenya, identification of the importance of a labor constraint led to the restriction

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1/ Where water is in short supply, a well-designed strategy will take account of the fact that this imposes varying constraints on the growth of different crops. For example, it takes more water to grow rice than to grow wheat, sorghum or vegetables. Since much tropical land lacks sufficient water to grow two rice crops a season, but enough to grow one crop of rice and another of wheat, sorghum or vegetables, a good strategy would call for a combination of crops which will yield the greatest output or income. (203, p. 11)

of tea plantings to less than one acre per holding through strict control of seedling distribution. This restriction prevented farmers from planting more seedlings than they could care for properly. In contrast, failure to identify a critical labor constraint in Tanzania led to a failure to intensify cotton cultivation in that country.

However, a word of caution is in order since the resource constraints of today may not be the resource constraints of tomorrow. Planners must look ahead and estimate which resources are likely to increase and which are likely to decrease. Such foresight can help in the selection of suitable strategies. (102, p. 176)

3. The Stage of Development

A second constraint which must be considered in choosing an agricultural strategy is a country's stage of development. Thus, a country at the start of its development with plentiful supplies of labor, should not normally select an agricultural development strategy which, like mechanization, requires skills, foreign exchange and other resources which it lacks; any more than a country in an advance stage with labor supplies which are scarce relative to capital should adopt a strategy which emphasizes labor-intensive techniques in agriculture.1/ Nor should a strategy be selected which is otherwise inappropriate to the situation in a country. For example, if land fragmentation is a serious problem, adoption of a mechanization strategy would be ill-advised unless adequate steps could be taken to consolidate holdings or otherwise permit efficient use of mechanized equipment.

4. Institutional, Attitudinal and Organizational Constraints

A nation's social, political and economic institutions and beliefs is a third determinant of agricultural development strategies. Thus, at the international level, agricultural development strategies are likely to embody a country's attitudes toward the role of foreign trade, foreign assistance and aid, foreign private investment, the importance of international regional cooperation, and the desirability of attaining economic independence; and at the national level, agricultural development strategies will reflect

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1/ For example, the United States' approach to agriculture makes maximum use of capital and minimum use of scarce labor on plentiful land. In recent years, less developed countries which have achieved high per-acre productivity generally have maximized the use of relatively plentiful labor on scarce land. The American (like the Russian) strategy results in high output per man, but in many developing countries this approach results in the under-utilization of scarce land, as well as plentiful labor. (85, p. 13)

a government's attitude toward the role of the private sector, the role which the public sector should play in stimulating development, the need for equality and justice in sub-national regional development, the question of family planning, unemployment (and, therefore, among other things, the choice of technology for public investment projects), the desirability of bringing about greater equalization of incomes, the tolerable level of consumption, the speed of development, retention of esteemed traditional ways and forms, or alternatively, institutional reform (e.g., changes in land tenure patterns), and so forth.

How underlying attitudes and assumptions influence the choice of development strategies may be seen in the cases of China and India, among other countries. Thus, Chinese leaders held the conviction that Chinese agriculture was backward mainly because of what the leadership considered to be China's feudalistic institutional framework. The Chinese approach to agricultural development was, therefore, based on the assumption that existing "feudalistic production relations" had to be replaced by production relations based on collective farming before agricultural productivity could be increased. (215, p. 91)

In contrast, India assumed that it could gradually improve existing backward production relations, and when this attempt failed adopted a development strategy which sidestepped them. Immediately after independence, India approached agricultural development with the three-fold assumption that (a) the technology required for agricultural development was available, (b) farmers were wedded to backward production techniques because of ignorance and illiteracy which made them suspicious of innovations and impeded their acceptance of new and profitable techniques, and (c) landlords (zamindaris), moneylenders and merchants exacerbated farmers' inadequacies by exploiting the farmers. The Indian strategy for remedying these conditions took the form, respectively, of (a) extension service systems to inform farmers about new production techniques; (b) literacy programs to increase the level of education and social welfare programs to gain the confidence of cultivators; and (c) land reform programs which sought to abolish the "zamindari" system, alternative sources of credit to free the cultivators from the moneylenders, and regulation and provision of alternative means of marketing agricultural commodities to protect farmers from exploitation by traders. (49, p. 34)

However, when it proved to be too difficult to reform the existing agrarian structure, and it became clear that the spreading of available resources thinly over the entire country would not lead quickly to desired increases in agricultural production, a new strategy was adopted which concentrated development efforts in areas of assured irrigation. The introduction of the Intensive Agricultural District Program in 1960-61 in three districts marked the first phase of the new strategy. The Program was later extended to an additional thirteen districts. A modified version of

the strategy, the Intensive Agricultural Area Program, was extended to more districts between 1964-65. The strategy, which involved the use of high yielding varieties of seed, reached a more advanced stage from 1964 onwards with the introduction of high yielding varieties of wheat and rice.1/ (216, p. A74)

Some constraints, like a government's attitude toward the private sector or its price policy for foodstuffs for urban workers which may discourage production, are self-imposed. Some are not, but occasionally the line between the two is thin. For example, foreign exchange constraints on the choice of a strategy usually are independent of a country's social, political and economic attitudes. However, if a country avoids certain kinds of foreign aid as a matter of principle, the foreign exchange constraint is at least partly self-imposed.

Planners may sometimes wish they had the power to change a government's self-imposed constraints. They may not always be able to do this. But for planning purposes, they should determine the extent to which they must accept as given existing attitudinal and institutional constraints on the choice of strategies and the extent to which the constraints are subject to revision. Only a good understanding of the political leadership's thinking can make it possible for planners to help select an appropriate strategy for achieving agricultural development objectives.

In many developing countries, the state of the public administration is a serious constraint on agricultural development. In these countries, failure to recognize this constraint has led to the adoption of strategies which make demands on the public administration that are greater than it can support. A commonly encountered situation is one in which a government administration is called upon to carry out more projects, or to intervene more frequently, than it can manage effectively.

5. Constraints at Varying Levels

In choosing a strategy it is important to distinguish among constraints at the national, sector and farm levels. Lack of investment resources may be a constraint at the level of the agricultural sector but not at the national level where a government has decided to concentrate available resources on industrial rather than agricultural development. And just as constraints may differ between the national and sectoral levels, they may differ between the constraints at either of these levels and those at the farm level. (196, pp. 5-6) Thus, where the availability of fertilizer

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1/ Three-fourths of India's cultivated acreage is not irrigated and "dry" farming prevails. Large parts of the country have not been touched by the high yielding varieties strategy and equally large parts can claim only "small islands within." (213, p. A135)

may not appear as a constraint at the sector level, at the farm level unreliable deliveries may prove to be a constraint; and while skilled manpower may be a constraint at the national level, farmers may have all the knowledge required to farm better than they do if only deliveries of fertilizers could be improved. Since the constraints faced by farmers are the ones which actually retard development at a given time, assumptions must fit the constraints which farmers face if effective strategies are to be selected. Too often, strategies turn out to be answers to the wrong questions because they are based on assumptions which are applicable to constraints at national or sectoral levels instead of the constraints at the farm level. For a strategy to be successful, it must be designed to insure that the farmer sees the actions taken under the strategy as contributing to the solution of his problems and the achievement of his objectives. (217, pp. 2-3)

Sometimes, a single strategy will not be enough to achieve agricultural development objectives. This is true, for example, where objectives include improvement of commercial and traditional parts of farming. Since the problems and constraints of commercial agriculture differ in nature from those of traditional agriculture, two strategies or two distinct components within an overall strategy have to be identified: one dealing with commercial agriculture; the other with the usually more pervasive and thorny issues of traditional agriculture.

In some countries, a single strategy may be an "over-aggregated" approach to agricultural development for other reasons. Thus, a country with diverse ecological, climatological or economic regions may find it necessary to devise different strategies for different regions. In Brazil, for example, great regional diversity and a tradition of regional autonomy in matters of development make the formulation and execution of a unified agricultural strategy impracticable. Turkey has two distinctly different regions -- the highland plateau and the coastal zone -- each of which requires a development strategy different from the other. (210, p. 27) This is also true of the dry zone and coconut-lands regions in Sri Lanka. Peru has three zones which required separate strategies. (51, Vol. 1, pp. 5-6, Vol. 2, pp. 82-105) Frequently, differences in development strategies arise from economic differences among regions of a country. Thus, economically backward regions in southern Mexico and Italy and in northeastern Brazil require development strategies of their own which differ from strategies in other agricultural parts of these countries; and the same may be true for a region which is more advanced agriculturally than others in a country, e.g., the Punjab in India.

6. Dealing with Constraints

The best agricultural strategy for achieving a given target or objective is one which, among available alternatives, is least bound by constraints. Thus, in a country with a foreign exchange

constraint, a strategy which makes maximum use of domestic resources, like labor, is better than one like mechanization, which requires imports. Implicit in the strategy selection process is the requirement that the greatest use be made of a country's abundant resources. Where land is plentiful, as in Brazil, a good strategy would make the fullest use of land. In countries with great rural unemployment and under-employment, as in Bangladesh, a good strategy would make the fullest possible use of surplus labor by means of labor-intensive projects, programs and production techniques. In countries where land is in short supply relative to labor, a good strategy also calls for a labor-using strategy. Land-scarce but labor-plentiful Japan, China, Korea and Taiwan have all developed successful strategies based on labor-intensive agriculture and small-scale, labor-intensive rural industry. (85, pp. 14-15)1 And in countries where capital is plentiful relative to labor, as in the oil-rich countries, a capital-using strategy which conserves scarce labor is desirable. Location can also be viewed as a resource. For example, Panama's development strategy for the 1970's treats its geographic position as an advantage and builds a set of appropriate policies and actions on it. (166, p. 87)

While constraints impose limitations on the choice of strategy, they can be dealt with either by sidestepping them or by devising a strategy with elements which fit the constraints. Thus, on the one hand, when India formulated its high yielding varieties strategy, it sought among other things, to sidestep the constraints imposed by its traditional farmers. On the other hand, Sri Lanka furnishes an example of how an agricultural strategy can be adapted to a specific situation. In that country, the low educational level and conservatism of farmers, which restricted rice production, constituted a constraint against a HYV strategy. In these circumstances, an intermeditate strategy was devised which involved the promotion of two local improved rice varieties. These gave significantly better results than other local varieties, but did not require as much investment, water, water control and discipline as did the high yielding varieties. The local improved varieties were also suitable for small farmers, something not always true of the high yielding varieties because of their more stringent financial, educational and labor requirements.2/ Moreover, the

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1/ As labor has become scarcer, the degree of labor-intensity is being reduced in most of these countries.

2/ Small farmers need much more help than large farmers if they are to make full use of the HYV technology. Above all, they require credit and irrigation facilities suited to the small size of their farms. (205, p. 25)

adoption of the intermediate strategy provided hope that it would help train farmers sufficiently to permit the later adoption of more advanced technologies such as the HYV approach required. (61, p. 100)

G. Implications of a Strategy

Before selecting a strategy, it is well to explore with care its possible repercussions. Sometimes, it easily may be discerned that a selected strategy will not achieve its avowed objective. For example, a strategy which emphasizes sophisticated and capital-intensive production techniques is unlikely to achieve an objective to raise the incomes of poor farmers. But sometimes, even if it is clear that a strategy will succeed in achieving an objective, there may be side effects which need to be considered. The Mexican experience is especially revealing of the side effects produced by an agricultural development strategy. The Mexican HYV strategy aimed at large farmers, allowed large producers, who were beneficiaries of subsidies, relief granted from taxation, and other economic incentives as well as the good prices they received for their crops, to do so well financially that they were slow to adopt efficient production techniques. In contrast, small private and ejido farmers produced wheat and other crops more economically than the large commercial farmers in the irrigated areas by combining small amounts of scarce and expensive capital inputs with abundant cheap labor. However, they were largely neglected or bypassed by the new strategy. Since the Mexican strategy also aggravated the existing income inequalities between, on the one hand, the large commercial landowners and, on the other, the small farmers in the private sector and the ejiditarios (farmers on cooperative farms), the social cost of the Mexican strategy was much greater than was necessary. (204, pp. 34, 38) If speed was important to Mexico's objective to find the best way to increase agricultural output, the HYV strategy aimed at large farmers which was chosen might have been justified despite its high cost. However, if the "best way" of increasing output was interpreted to mean increased production at low cost, the strategy adopted might better have been directed toward small private and ejido farmers.

The process by which a strategy is selected from among available alternatives should, therefore, include careful consideration of its possible negative effects. From the examples cited throughout this chapter, it is clear that some unforeseen negative effects arising from the adoption of the strategies discussed might have been foreseen and provided for with contingency measures if a systematic analysis of the strategy had been made prior to its adoption.

The HYV strategy is a good example. An HYV strategy usually has implications for regional and personal income distribution which need to be considered. Since a HYV strategy usually must be confined to areas with adequate water and water control, it may lead to considerable increases in income inequalities among regions of a country. (207, p. 21) It may also lead to increased income

inequalities among farmers, since the HYV strategy often benefits larger and wealthier farmers more than smaller and poorer farmers. (203, pp. 58-59)

The problems raised by HYV strategies have been dubbed "second generation" problems. However, this is misleading since it implies that the problems were unpredictable or unavoidable. Actually, most of the so-called "second generation" problems probably were predictable had the implications of the HYV strategies been considered with the care they deserved. Certainly, in India, planners were aware of some of the negative implications of the HYV strategy before it was adopted, although they made little effort to assess their impact. (49, p. 60) In any event, it is clearly prudent prior to adoption of a strategy to assess its implications, the negative as well as the positive results likely to accrue from its adoption.

Once a strategy has been chosen, it is important that those who will be concerned with agricultural and rural development are well-informed about its nature and implications. This will help insure that the policies and policy instruments selected to give effect to the strategy are consistent with, and properly a part of, the chosen strategy. Unless this is done, policies and policy instruments may turn out to be inimical to the strategy. This has happened.

IX. POLICY AND POLICY INSTRUMENTS

There are two broad types of policy that the policymaker has to be concerned with. First, there are priorities among regions, subsectors and objectives. Strategy helps here by laying out the broad outline or framework for where the sector is to go. This, however, is only guidance when it comes to working on policy issues like manpower, employment, natural resources, investment criteria and technology. Priorities must be worked out in detail to establish the criteria by which decisions can be made in the day-to-day implementation of the plan. Investment policy, for instance, should set the discount rates at which funds are made available for different private and semi-public activities. Natural resource policy may have to allocate water, for instance, between rural-agricultural and urban or industrial uses.

The second type of policy involves the instruments for achieving objectives. Price supports, taxes, marketing boards, credit, tenure systems, extension services, and provision of inputs are all instruments for carrying out policies. Policy instruments cover both the activities undertaken by the government directly and the actions designed to influence the activities of the private and semi-public sectors.

The establishment of priorities and the selection of instruments to carry out objectives are interrelated aspects of the policy setting process. Different policy instruments may also be interrelated. For example, price policy may be ineffective at reaching subsistence farmers. Hence, it will be necessary to establish land tenure, marketing and extension policies to bring subsistence farmers into the market economy if price policies are to reach them. But suppose farmers would respond to price changes but cannot get the inputs they need to expand their production. In this case, price policies must be joined with policies to insure that necessary inputs are available to the farmers. If inputs are available, it may also be necessary to provide extension services to show farmers how to use the inputs.

The problem that the policymaker faces is thus a three-part one. First, he must determine what the specific constraints are that are retarding movement toward the objective, e.g., low returns to farmer investment in new technologies may retard growth in output.

Second, the policymaker must determine whether the policy instruments available can remove or reduce the constraint. If the instruments will remove the constraint, e.g., if a higher price will raise returns sufficiently so farmers adopt the new technology, or if market improvements are made so inputs are available for farmers to adopt the new technology, then he can adopt the instrument and work out with the various implementing agencies the best way of implementing the policy.

If, however, the policy instruments available are inadequate, that is, if the institutional environment is such that policy changes do not affect the people facing the constraint -- in this case the farmer -- then a third step must be taken. This is the institutional reform of the environment so that policy instruments will work. The two most significant institutional reforms are of the land tenure system and of the marketing system.

In practice, there is no easy way to determine whether a policy will work in a developing country without trying it. Even if the policy works, it may only reach a small proportion of the farmers, usually the larger and more commercial ones. In most developing countries, the effects of institutional constraints, e.g., inadequate marketing or tenure systems, are only roughly known. Experience with policy variations is fairly limited. Thus, new policy instruments will often have to be experimented with.1/

A. Inputs

Arthur Mosher has divided the measures needed to increase productivity in agriculture into five essentials and five accelerators that are not essential but do help things along. The five essentials are markets for farm products, constantly improving technology, local availability of needed supplies and equipment, production incentives for farmers and transportation.2/ He argues that these are essential because increased production cannot take place without them. For instance, transport is essential because farmers will not grow more unless they can move the surplus to a market. Transportation costs increase the cost of inputs and decrease the price the farmer receives for output. Thus when transportation costs are high, farmers find it less attractive to use purchased inputs in production. (102)

Not all experts agree with this division between essentials and accelerators. Some maintain that education is an essential. (218, p. 223) Some argue that planning is necessary if the other essentials are to be produced and coordinated. China's policies on self-reliance and rural industrialization to provide farm inputs locally have substantially reduced the need for transportation in that country. The high cost of transportation is one of the major

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1/ The attempts of developed countries to deal simultaneously with unemployment and inflation are just as experimental.

2/ The five accelerators are: education for development, production credit, group action by farmers, improving and expanding land, and national planning for agricultural development. (102)

reasons for the local self-reliance policy. (219, pp. 78-79; 220) Farmers groups would be an essential if they were necessary to make other essentials available. For instance, producers' associations provide both inputs and extension for many cash crops in Latin America and the Farmers' Associations do the same in Taiwan and Japan. Credit was felt to be essential to the Minimum Package Program in Ethiopia. (221, p. 42) Participation by the farmers was also considered essential for long term growth in this program.

Thus there is some disagreement about what the essentials are in various circumstances. This does not mean Mosher is necessarily wrong. What it means is that what is essential for agriculture in general is not always an essential policy problem in a particular situation. What the policymaker must do is identify and concentrate on what the critical problems are in a particular situation. For example, transportation may be an essential for agricultural development but it may be adequate in a particular situation. No action need be taken on transportation. The policymaker must direct resources into areas where action is inadequate or lack of action has created a bottleneck. This may be an item on Mosher's list of essentials or it may not.

1. Package Programs

If Mosher's five inputs or any other combination of inputs is truly essential in a particular situation, then by definition supplying essentials together will increase output more than supplying them separately in different areas. (22, p. 140) All essentials must be present if any progress is to be made.

Frequently, however, policies fail because of the failure to provide adequate supplies of particular inputs as in Indonesia and elsewhere. (223, p. 38; 224, p. 7) Fertilizer, quality seeds and pesticides are frequently in short supply. Output has declined in Zaire, for instance, because of a decline in seed quality. Even when available, inputs are often distributed too late for correct use or are overstocked in some areas and understocked in others. (56, p. 1; 182, p. 62; 225, p. 120; 226, p. 60) The result is that all the essentials are not available anyplace.

To avoid this problem, a number of countries have begun introducing policy measures in packages so that all the essentials are provided together. (206, p. 7; 218, pp. 222-223) Since there is rarely enough manpower or supplies to cover the whole country, this usually means concentrating these packages in a few areas or on a limited number of farmers -- usually the better off farmers. Thus the Intensive Agricultural District Program in India concentrated on areas with adequate water and entrepreneurship. (227, pp. 284-285) In Zaire the World Bank recommended concentrating on areas near cities and towns, near existing transportation, where people had demonstrated good agricultural practices and where soils and climate were favorable. The Minimum Package Program in

Ethiopia was organized to cover blocks extending five kilometers on each side of a 75 kilometer stretch of road. This program included provision of feeder roads as well as credit, inputs and extension and was initially generally successful. (221, pp. 40-42)

Package programs often have not worked as well as their sponsors hoped. Output has not risen as much as expected and adoption of new practices has lagged. (228, pp. 81, 83) The most frequently raised complaint about packages is that the technology they are built around is inadequate. In India, for instance, it was reported that the technical package there was not profitable enough. (49, p. 85)

There is some reason to doubt that this is the real problem as often as it is claimed to be. Because packages are made up of several elements it is often difficult to determine where the difficulty lies. Studies in Africa were not able to distinguish whether low profitability or high risk discouraged farmers from using technical packages. (229, p. 66) Other reasons for package failures are also possible. When a survey was taken in India, only 36 percent of the farmers suggested better and larger supplies as a need. Sixty-nine percent of the officials felt more and better supplies were needed. Many farmers simply did not want more fertilizer, improved seed or other innovations. (230, p. 36)

The technical package is sometimes a problem, however. In Ghana a maize package required a change in planting time and the people felt the new maize was not as suitable for consumption. The "improved" practices included growing maize alone rather than interplanted with other crops. This might have reduced overall farm income. The project failed to generate much interest in this package. (63, pp. C26, C29) In many places new technical packages have been inadequate because they ignored the additional labor required. (231, pp. 23-24) Problems with technical packages are much worse when they are rigidly applied, as happened in Indonesia. Local government had no authority to adapt the packages to local conditions. As a result, yields were not up to the farmers' expectation and the farmers became resentful and many defaulted on credit obligations. The Government's Green Revolution program was halted. (223, pp. 42-43)

Technical packages often require a number of changes in the farmer's mode of operation at one time. This makes the package highly risky from the farmer's point of view. (182, p. 67) The only way to eliminate this risk is to offer the farmer a guarantee if he adopts the package. This is what is done in contract farming and production for some producers' associations (see the Extension chapter). In most cases, however, there is no guarantee so the farmer must learn a lot about a number of new things at once if he is to understand the new technology and accurately estimate the risks involved. Not surprisingly this is often too large a task so the farmer either rejects the package, adopts only part of it, or adopts it on only part of his land. For instance, farmers almost always use less than the recommended amount of fertilizer. Even many large farmers in Java in Indonesia diversified their rice crop

among high yielding, local and national varieties. (223, p. 53) Farmers at Puebla in Mexico experimented with new practices and often adopted them a little at a time. (232, p. A101) If farmers typically adopt new technologies a little at a time, it suggests that the package approach may be heading in the wrong direction. A sequential approach based on a step at a time may be more appropriate. This is discussed more fully in the Extension and Research chapter.

This does not mean that packages are always a failure. The packages associated with dwarf varieties of wheat and rice have been highly successul in raising output in some parts of the world. (233, p. 12) But even this may turn out to be a mixed blessing. These packages include large amounts of fertilizer at a time when the price of fertilizer has risen drastically. The cost of importing fertilizer is a serious burden in many countries. (234, p. 31)

Thus, although farmers do need all of the essentials, it is often very difficult to determine what these essentials are. The result is that many packages have failed because of inherent defects in the package, e.g., an inadequate technology, because essential elements were omitted or because farmers just were not interested. Since this has been true so frequently and because the same problems have led to the failure of many extension programs, package programs are not a good idea unless they have had complete field testing and are significantly and consistently adopted by farmers in these tests.

2. Testing Individual Programs

The major alternative to introducing measures in packages is to introduce them one at a time and this is the approach used by most developing countries. In most countries the first step was public works for transportation and water. Next came the provision of inputs and measures to improve technology, primarily extension services. (235, p. 174) Only then have marketing reforms or policies to improve incentives been tried, e.g., price policy and land reform.

There is a certain rationality in taking these steps in this order. Since governments often don't know how serious the parts of a problem are, it makes sense to begin with the broadest, easiest and least controversial measures and work up to the narrower, harder and more risky measures. Transportation is an easy first step as it benefits all industries, the government and the military and fits in with ideas of nationalism. Provision of inputs and extension are more specifically agricultural but not usually controversial.

When a country considers changes in tax, price, tariff, import, and other policies which have broad income distributional implications, the problems become more complex. What is given to one group, e.g., higher incomes for farmers due to higher prices, is

taken from another group, e.g., urban consumers who must pay more for food. Finally, there are the institutional reform issues which mean fairly major changes for significant groups in society. Land reform, marketing reform and the formation of farmer associations and cooperatives may raise major political and social questions for a country. Hence, it is not surprising that institutional reforms are the policy changes which have been put off the longest except where extraordinary circumstances like revolution, e.g., in Cuba, China, Bolivia or Peru, or threats of revolution or conquest from abroad, e.g., Taiwan, Japan, have generated the commitment necessary to undertake such reforms.

In practice, there have always been grounds for hope that easier measures would work. At each stage some farmers responded to the improvements, increased output, adopted new techniques and became more commercialized in production. As policy improved and more of the essentials became available, more farmers took advantage of this availability. These, however, were usually middle and large scale farmers. Generally, the smaller the farmer, the less likely that he has been drawn into commercial production or that his output has expanded beyond what more use of land and labor could provide. (236, p. 1)

One of the reasons that larger farmers succeed in adopting new methods and increasing output is that they can help obtain their own essentials. They can afford to entertain an extension worker or to go to town to pick up inputs or deliver produce. This may be totally beyond the small farmer who is ignored by extension workers and faces much higher costs of transportation. In addition, when the delivery mechanisms for services, especially those providing inputs, break down, the larger farmer has a greater capacity to overcome such breakdowns. He can get first choice of what little is available or bypass breakdowns by going further afield for services.

3. The Choices of Inputs

Physical and policy inputs are essential for all farmers. The question is whether and how these inputs will reach particular groups of farmers. The package program approach has the right idea: supply everything that is needed. It is just that in practice the correct package has eluded policymakers. Essential measures have been omitted. But this is also true of adding one policy at a time. There has been a tendency for governments to never get to the harder issues; again essential measures have been omitted.

Thus the key to success is not the use of a technical package or a step-at-a-time approach. The key to success is including the measures that are essential in particular circumstances. In virtually all cases these measures have included the provision, either through cooperatives, farmers' associations, processors or the private sector, of physical inputs. Beyond this there has been no substitute to finding out from the farmers what they need. In many countries what the farmers say they need is land.

Finally, one element of any group of inputs is flexibility in application. One of the defects that has led to the failure of package programs is rigid application. This is not only contrary to the way farmers learn to adopt new practices but often leads to a poor fit of the package to local conditions. Both packages and programs must be tested and adapted in field trials but also tested and adapted on the farmer's land.

B. Incentives

Price, tax and other policies are closely related to input supply since it is the prices of inputs almost as much as their availability which determines input use. Prices and taxes on output, land and income also affect incentives. The combination of input and output prices, taxes, etc., together must be such that the farmer finds it is in his interest to adopt new technologies and expand output. Nowhere has development or expanded output come about when farmers have not found the increased effort and investment worth the effort involved. (30, p. 9)

On the consumption side of incentives, what the farmer wants or needs income for, the availability of consumer goods and services, like health and education services for himself and his family, and the direct taxes he must pay also influence the farmer's decision. (237, p. 78; 102, p. 100; 238, p. 249)

The incentive to the farmer is not the amount of money he makes but the goods and services this money will buy. Money is an intermediate objective. Thus it could be that a farmer's unwillingness to increase production is due to a low valuation of the things he can buy. This in turn may be due to the limited selection of things to buy.

Many observers have noted that there is a wide range of consumer goods available in stores in rural areas in China, much more so than in countries with a less dynamic rural sector like India. This may be due to more equal income distribution in China which provides an increased consumer market. The hypothesis that these goods also have an incentive effect, however, cannot be excluded.

In Japan a land tax paid in cash helped commercialize agriculture and forced farmers to increase production. (239, p. 26) Medical care and education for children also have this effect. A lack of consumer goods is reported to have discouraged agricultural production in Zaire. In most other countries, the consumption side of incentives has been largely neglected.

1. Yields and Input Subsidies

Yields have a significant place in an incentive system because the greater the physical return to an output, the lower the price can be and still give the farmer the same income. (240, p. 59) The greatest incentive effect is created when both prices and yields are favorable. The combination of higher yields,

subsidies for inputs and price supports led to the adoption of new technologies, e.g., tube well and pump irrigation and high yielding varieties in India, Pakistan, Bangladesh and elsewhere, and striking increases in output to larger scale farmers. (203, pp. 10, 57) This combination also was a main cause of increased cotton production in Tanzania.

It would obviously be desirable, however, if yield increases were sufficient so that farmers kept increasing output without higher prices. This would allow increased farm income without imposing a burden on consumers. This happened in Mexico, for instance, where crop prices declined nearly one percent a year from 1940 to 1962 at the same time that quantity and variety of food increased. (203, p. 21) Developed countries generally seem to have reached a point where improved technology is habitually adopted and output increases regardless of relatively minor declines in price or acreage. Japan and Taiwan have also reached this state. (146, p. 51; 47, pp. 169, 211-213) Thus, technological improvements are the preferred method of increasing farm income if the conditions for the systematic development and adoption of such changes can be created. (143, pp. 10-11) Significantly more productive inputs may be especially helpful when farmers are just beginning to adopt new technologies. (241, pp. 25-26; 143, p. 293; 242, p. 7)

The profitability of a new technology also depends on the prices of necessary inputs. Thus, if inputs are not significantly more productive than traditional methods but input costs are high, and any input cost may seem high and risky to a farmer who has not used purchased inputs before, then it is unlikely that farmers will feel it desirable to purchase such inputs. (20, p. 25; 241, pp. 25-26) This problem can be overcome by either increasing input productivity or lowering input price (in addition to raising output prices discussed above).

Because the productivity of inputs is generally fixed in the short run, many countries adopted input subsidies as a way of encouraging farmer use of inputs, e.g., Pakistan. (243, p. 20; 244, p. 66; 226, pp. 53-53; 95, p. 11) Fertilizer was subsidized especially frequently. (237, p. 112) In some cases, such subsidies were necessary to compensate for the price raising effects of import duties, protection of local producers and high marketing costs. (243, p. 20; 245, pp. 105-106; 159, p. 10)

One advantage of input subsidies is that they are paid only to those who use the inputs. Price supports go to all producers who sell in the market. (246, p. 589) A disadvantage of subsidies is that low prices for inputs may discourage private producers from entering the input supply trade as happened in Nigeria, India and Indonesia. (144, p. 40; 225, p. 120; 247, p. 111) The latter problem could be handled in the way the subsidies are provided.

2. Output Price Policy

Of all the incentive policies, output price adjustments were the most frequently used policy instrument. Frequently, governments held down prices to provide cheaper food for urban, more politically

active, consumers. (102, pp. 104-105; 66, p. 149; 182, p. 81) In other cases export duties, marketing board surpluses and exchange policies reduced farmer prices. (144, p. 44) Compulsory procurement at set prices also reduced farmer incentives. In these cases farm output was reduced. (225, p. 33; 102, pp. 104-105; 248, p. 61; 249, p. 202) The disincentive effects of these policies was especially apparent when the policy changed to one promoting greater output. Such changes were often followed by significant increases in output. (250, p. 9; 251, p. 52)

The price policy situation is not quite this simple, however. Almost universally, observers found that farmers in developing countries respond to shifts in relative prices, especially when the crop took a small part of the total crop area. (252, p. 741; 253, pp. 160-161; 254, p. 134; 255, p. 39; 143, p. 211; 20, p. 26; 256, p. 197) In some cases, the responses to relative price shifts were similar to or even higher than the response of farmers in developed countries. (257, pp. 309-310; 258, p. 4; 66, pp. 149-150)

Attempts to increase the output of all crops by raising all agricultural prices, however, were not as successful. In India, for instance, prices increased much more rapidly than output, even though the use of inputs such as high yielding variety seed, fertilizer and water also increased. (47, p. 206; 253, p. 161) Even in developed countries, the response of total supply of all crops to higher prices is low. (143, p. 2)

In addition, there may be considerable variation among regions, crops, scales of farm and individual farmers in price responsiveness. Responsiveness is increased by the existence of strong commercial markets and the availability of inputs. (253, p. 156) Commercial crops and farmers respond more than subsistence crops and farmers. (259, p. A-70; 143, p. 200; 235, p. 176; 260, p. 3) Thus, price changes may do little to help the small farmers who need help the most. (261, p. 7) This is especially true of subsistence farmers, since benefits from higher prices depend on marketed not total output. (206, p. 21; 143, p. 3)

Three other possible uses of price policy have been proposed. First, higher prices can increase returns to market sales and thus, over a period of time, draw subsistence farmers into the market. (235, p. 176) Unfortunately the output of larger producers tends to increase rapidly so this becomes a costly way to commercialize small farmers. Second, price stabilization can reduce risks to producers -- thus encouraging the use of new technologies and purchased inputs -- and stablize prices for consumers. (20, p. 25; 262, p. 365; 245, p. 100; 94, pp. II, 68-69; 237, p. 100; 4, p. 134) In West Pakistan, for instance, the imports of PL 480 grain facilitated the shift of many farmers to cash crops because it stabilized the price of food crops. (244, pp. 61-62) In Brazil, farmers began growing sugar cane but reverted to cereals due to price instability. (102, p. 102) Third, price policy can be used to redistribute income between urban and rural areas. This will

not, however, solve the redistribution problem within the agricultural sector. The two countries which have been most concerned about income distribution in rural areas, Israel and China, used price, or terms of trade, policy to shift income towards rural areas but they have had to provide other means to equalize income distribution within rural areas. (101, p. 349; 68, p. 50)

In summary, output prices must be high enough to pay the farmer for his inputs and give him a return for the extra effort and risk involved in the use of any technology. (263, pp. 23-24; 242, p. 7; 9, p. 58) The output price high enough to do this will depend on the prices and productivity of inputs and technologies. Also, price policy alone can be highly effective in helping shift production from one crop to another. However, raising prices will not be of as much assistance in raising gross agricultural output once prices are high enough to pay the farmer's costs.

3. Methods of Adjusting Prices

A major problem of any price policy, for inputs or outputs, whether up or down, is that someone has to pay the cost. For example, food prices often were kept low because forcing urban consumers to pay the full costs of adequate production was considered too risky politically. As a result, shortages developed that led to increased imports. In the past, when PL 480 grain was plentiful and could be paid for in local currencies, this was a low cost way to make up food deficits in many countries. The end of grain surpluses in the West and increased shortages elsewhere have drastically raised the costs of such policies. As a result, higher food prices are the rule in much of the world. (203, p. 20)

Where cheap methods of bearing costs were not available, coercion was often tried. Many countries tried compulsory grain procurement and rationing as solutions to the problem of grain costs. This, however, often caused declines in grain output. It also put a tremendous burden on the administrative capacity of these countries. Black markets formed, governments failed to achieve procurement targets and imports increased. Most governments lacked the control and understanding of trade necessary to enforce compulsory procurement programs. (234, p. 20) Attempts to substitute government procurement for private trade were given up for at least some commodities in Pakistan, India, Burma, some East European countries and elsewhere.

There are several ways to reduce administrative and other costs of price policies. First, the farther the price the government is trying to establish is from a price that would match supply with demand, the greater the costs will be. For this reason it may be desirable to let the market establish a price level and then to stabilize prices in that vicinity rather than to try to push prices up or down. Price stabilization has become one of the more popular developing country price policies. (3, p. 66; 180, p. 150; 249, p. 203)

Similarly, if input subsidies are used to encourage farmer use of inputs, it is preferable that such subsidies be as low as possible. As farmers become accustomed to their use and farm productivity rises, these subsidies should be reduced unless they are to compensate for duties or other price raising actions elsewhere in the economy. When artificially low prices for inputs are maintained for long periods, they lead to overuse of such inputs and neglect of alternative methods. For instance, the free provision of irrigation water in Sri Lanka has allowed very inefficient and wasteful use of this resource. In Pakistan, plant protection activities were provided free of charge. This did spread pesticide technology throughout much of Pakistan. However, it was a very costly way to use the limited technical personnel available. (244, p. 66)

Second, it may be desirable to support only a few crop prices as this greatly reduces administrative costs. This policy has frequently been followed in developing countries. (4, p. 145) A problem with this policy is that it tends to lower production of other crops as it increases the production of price supported crops. This makes sense only if the price supported crops use a more productive technology so production gains are greater in the supported commodities than the losses are in other commodities. Even then there are limits to such a strategy. In the Philippines, for instance, price supports for rice led to an over-supply and a fall in prices for rice. The same thing happened elsewhere. (212, pp. 97-98) Generally it will be necessary to provide for diversification to cash crops once price support and other measures have generated a siginficant increase in basic food grains.

Price stabilization is best achieved by government buying, selling and storage operations for domestic crops and by financial averaging for exports (financial averaging is the creation of a reserve in years when exports bring high prices that can be paid out to bolster domestic prices when international prices are low). (260, pp. 2-3; 66, p. 154; 4, p. 134; 249, p. 205) Such operations are not costly if they average out gains and losses over time. (264, p. 11) There will, however, be capital costs in providing the storage necessary for buffer stocks. (260, pp. 2-3)

For the farmer, a major element in price instability may be the difference between farm-gate, harvest-time prices and prices a few months later or prices received if he could sell in a competitive market. (4, p. 134) Hence, one of the least costly ways of increasing returns to the farmer is to increase his ability to store grain at low cost or to sell in competitive markets. When Brazil instituted a system which permitted the producer to more easily hold part of his production beyond harvest time, an estimated 20 to 30 percent of rice stocks in major producing areas were still in producers' hands five months after the harvest. (265, p. 33)

If incentive programs are to be successful they must provide the farmer with a combination of input prices, increased yields and output prices which together make it worthwhile for him to

increase his output. Taxes, duties, tariffs, exchange rates, marketing board surpluses, and subsidies all enter as factors in either input or output prices and so should be considered only when their effects on agricultural development are being kept in mind.

Clearly, the preferred way to promote agricultural development is through improved technology. Where this is not feasible, or where specific crops need to be developed, price increases or input subsidies will help. The lowest cost price program, however, will be one of price stabilization around the trend of balanced supply and demand. Price increases will not generally help small farmers, sharecroppers and tenants as much as large farmers. (242, p. 7) Here institutional barriers will bar the way. A price increase may only present a windfall to merchants or landlords. A subsidy on inputs is of no use if input distribution systems can't deliver the goods. (1, p. 114) Institutional reforms such as improved marketing, cooperatives and land tenure reforms will be needed. (266, pp. 13-14; 17, p. 25) The countries that have achieved agricultural growth rates of five percent or more during the 1950's, for instance, were those that had a minimum level of both incentives and effective institutional arrangements. (191, p. 7)

C. Credit

1. The Need for Credit

There is considerable agreement that increased farmer credit is a great need in developing countries. (48, pp. 4-5; 267, p. 15; 97, pp. 286-287) Many experts recommend more credit. (2, p. 10; 268, p. 117) Many countries have introduced credit programs. (212, p. 96) Credit is particularly needed to finance increased uses of new inputs and thus to increase production and incomes. (269, p. 286; 35, pp. 9-10) For instance, the International Rice Research Institute estimated that shifting from traditional methods to the methods recommended for high yielding rice raised the input costs for the average Philippino farmer from $20 to $220 per hectare. (270, p. 80) The recommendations of the Puebla Project staff in Mexico, where farmers were using more purchased inputs to begin with, raised input costs from 19 to 82 percent. (271, p. 87)

Farmers receive considerable credit in most countries from informal sources like relatives, friends and moneylenders. (2, p. 10) In fact, even in countries like India, where moneylenders are pictured as inevitably extortionate, private lenders were able to compete successfully with public credit due to more flexible and streamlined loan procedures and sufficiently competitive financial terms. (49, pp. 65-69; 381, p. 47) Often governments make this worse by tying credit to the use of inputs or other entanglements that discourage farmers from using credit. This is especially serious when credit is tied to the use of inputs that are late in arriving.

Although farmers frequently report that credit is a need, it is clearly not a need in the same sense that physical inputs like fertilizer or seed are needs. It is easy to mistake lack of credit for the real problems. (272, p. 1) In India, for instance, farmers bought pumps, often with nongovernment loans, but the real constraint was lack of promised electrification that would permit the pumps to pay for themselves. (230, p. 26; 225, p. 129) Even when credit is necessary, restrictions on who gets it mean that those who need it most don't get it. Those that get it often don't need it. This occurred at Vihiga in Kenya, for instance. (231, p. 96)

Empirical studies have often found that credit has not been a constraint on the use of new inputs, especially in Africa. (229, pp. 69-70) In Nigeria and Ghana, for instance, it was found that traditional sources of credit could finance higher rates of growth than were being achieved although not the maximum growth possible. (144, p. 7; 63, pp. C40-C42) Many more farmers in Malawi bought inputs with cash when credit was not available than when it was. (231, p. 91) Credit is often unnecessary for modern inputs because these are self-financing. When inputs are worth the effort, they pay for themselves in a single season, including indigenous credit costs, or they can be adopted in small doses so the farmer can develop the necessary capital in a few seasons. (234, p. 23; 241, p. 26) In recent years commodity prices have been high enough to finance inputs in some countries.

Most investment in agriculture can be undertaken with labor if tenure conditions and prices make this worthwhile. (229, p. 68; 235, pp. 173-174) If tenure and prices are inadequate, then credit is unlikely to be sufficient to generate changes in output. For the poorest farmers, their greatest need is more income rather than credit.

This does not mean credit has no role to play in agricultural development. Short term credit may speed up development processes that are already going on for other reasons. Credit may be especially helpful to the poorer farmers who have the least capacity for self-financing. Credit may be more important following a land reform or other major institutional reform as such reforms disrupt traditional credit systems and make credit more necessary. (273, p. 15)

Small farmers have special needs for consumer as well as production credit. In Gambia, the primary small farmer credit need was for consumption credit. (63, p. B42) In some cases, farmers don't even distinguish between production and consumption credit. (274, p. 293) In Asia over one half of all borrowing by farm households goes to finance consumption. As a result of his need for cash, the small farmer is often forced to sell to larger farmers part of the inputs he receives through loans in-kind. In Tanzania this situation was aggravated in a tobacco growing program because farmers were unable to grow maize for their own consumption needs.

Unfortunately, the small farmer's need for consumer credit is often ignored by official credit programs. Such programs often explicitly exclude consumption credit, e.g., by providing loans in the form of production inputs rather than cash as in Tanzania, a project in Ethiopia, in parts of Mexico, Pakistan and elsewhere. (204, p. 36; 275, p. 687) Official production credit often required repayment at harvest thus also depriving the farmer of grains from delayed selling. (97, p. 287) To prevent the use of production credit for consumption, many credit programs require the farmer, with the aid of an extension agent, to prepare a farm plan. This must be followed by further extension and production supervision to see that the farm plan is implemented. (97, pp. 287-288) Supervision may also be a part of in-kind lending. In some cases, credit is used to require farmers to grow particular crops and to market through approved channels. (105, p. 318) In Mexico, the lack of contact with the real needs of the farmer was carried to the extreme of simply providing inputs to farmers and charging the account of ejido credit societies for these inputs without even telling farmers why they had suddenly been granted credit. This led to a thriving black market in inputs, sales of inputs to private farmers and drastic increases in the indebtedness of the ejido societies to the bank. (204, pp. 33-36)

In many cases, there is a need for medium and long term credit to purchase cattle or equipment or make building or land improvements. Small farmers may require longer term credit to pay off obligations to moneylenders and thus free themselves to invest in and improve their farms, as in Bangladesh. Longer term credit may be required to finance market development and storage. (276, pp. 15, 37) Since marketing expands much more rapidly than output as agricultural production increases (see Marketing Section), marketing may have a special need for credit. This type of credit may be required by cooperatives, farmer associations and small food processors as in Costa Rica. (277, p. 31) In Mexico, credit was made available for all phases of production, processing and marketing to support the development of apple production. (278, pp. 54-55) Artisans, small merchants, boatmen, rickshaw pullers who live in rural areas may also have needs for medium and long term credit. (279, pp. 15, 43) Longer term credit becomes especially important when equity and rural development become government objectives as it is precisely these types of small farmer and rural production and service activities that will form the basis for more equitable growth and rural development. Most government-sponsored rural credit programs, however, specifically exclude all but short term production credit. Where longer term programs are approved they are often not funded. (279, p. 43)

Thus the first step in developing any credit program is to determine whether farmers really need credit. If they do need credit which farmers need it and for what and how long? With this information credit programs can be designed that are truly responsive to the problems farmers face.

2. Collateral, Subsidies and Repayment Rates

In many countries small farmers are excluded from credit programs because of collateral or down payment requirements that they cannot meet. (231, p. 96; 267, p. 30; 280, p. X9; 274, pp. 292-294; 281, p. 18) Even when there are no such requirements, there is often a presumption that small farmers are unreliable so they are excluded simply because screening committees don't trust or like them. Even where such factors cannot be shown to be operating, small farmers are a disproportionately small part of total loan receivers. (282, p. A107)

The collateral problem for small farmers is aggravated by another common feature of credit programs, especially programs supposedly aimed at small farmers. Often these programs are subsidized as an aid to small farmers or as an inducement to farmers to adopt the technology package of which the credit is a part. This subsidy has two unfortunate affects. It reduces the amount of funds that can be loaned and it increases the demand for loans, often for less productive purposes as in Korea, Kenya and Brazil. (273, p. 37) The drain on loanable funds is increased further when the administrative costs of lending are high, as they are when dealing with large numbers of small loans or when complex loan provisions and production plans make supervision expensive as in Kenya. The result is that credit must be rationed by some means other than interest rates among the available consumers. The usual tendency is for amount of security, i.e., collateral, to become a rationing criterion. Thus low interest rates tend to indirectly exclude small farmers from getting credit by raising collateral requirements and decreasing funds available.

Large farmers not only benefit from the cheap credit but in Bangladesh they borrowed at cheap rates and re-lent the money to small farmers at higher rates. Thus the subsidy went to the traditional moneylenders rather than to the small farmers.

Not only is subsidized credit frequently damaging to small farmers, it is usually unnecessary. In Gambia, for instance, primary cooperative societies were charged nine percent interest and farmers were charged 15 percent in a successful loan program. (63, p. B42) In Japan, Korea and Taiwan, farmers wanted timely and adequate rather than cheap credit. (242, pp. 6-7) Thus, the most successful credit programs for small farmers will be those that charge the full cost of funds and credit administration, especially on short term loans. (234, pp. 22-23) This means, however, that administrative costs must be kept low.

Peculiarly, discrimination against small farmers persists even though empirical studies of loan repayments show that small farmers have better repayment rates than large farmers. (92, p. 89; 59, pp. 14, 54-55; 283, p. 24; 63, p. C42; 231, pp. 93-94) Exceptions to this occur where small farmers have begun to regard loans as an income supplement which they need not repay or where

crop failures prevent repayment. (279, p. 14) In Mexico, for instance, fertilizer company loans, clearly not a government grant, are repaid 97.5 percent of the time on the average and never less than 95 percent of the time. The Ejidal Bank average is nearer 80 percent. (59, p. 11)

3. Loan Administration

A great deal can be done to increase the use of credit by small farmers while maintaining high repayment rates. For instance, it must be made clear that the loans are loans, not grants, and farmers must repay them. This does not mean telling the farmers this; they already know what a loan is. Rather, it is necessary to take action against defaulters as rapidly as possible. (221, p. 42) Some defaults may be deliberate. Larger farmers or money-lenders may try to destroy the credit program to regain their control of rural lending. (279, p. 15) A second type of willful default results from farmers waiting to see if the lender is, in fact, serious about repayment. They are testing the political will of the government. Both types of defaulter must be discovered and dealt with early if their example is to be kept from spreading. (279, p. 14)

Another requirement for a sound credit program for small farmers is that credit actually be for what the farmer needs. This means that loans must be granted for consumption as well as, even before, it is granted for production. When credit is tied to technical packages, the packages must actually be what the farmer needs. A credit program at Vihiga in Kenya failed partly because it was restricted to the financing of fertilizer purchases when the farmers needed credit to hire labor. (231, p. 96)

Loan conditions such as collateral or down payments must be eliminated or modified, at least until the farmers get the necessary resources. The evidence suggests that lack of collateral need not lead to unacceptable default rates. In Mexico a fertilizer company granted character loans unsupported by collateral and collected all but 1.5 percent of its funds. (59, p. 14) In the Philippines, the U.S. Agency for International Development provided collateral for a program so farmers would not have to and all of the farmers repaid on time. (92, p. 89) Consumer loans were granted in Mexico where, up to one point, there were no defaults. This is similar to the 99 percent repayment on consumer loans in East Pakistan and Brazil. Paradoxically, granting consumer loans seems to improve repayment on both consumer and producer loans. In Mexico, farmers receiving consumer credit had ten to twenty percent better repayment rates on their production loans than farmers who received only production loans. The Wolamo Agricultural Development Unit in Ethiopia also increased repayment rates by granting consumption credit in the crucial pre-harvest period.

Longer repayment periods have also been shown to increase repayment rates. Where repayment dates are set at normal harvest time, default is automatic if the harvest is late as happened in

Kenya. In addition, since crops can often be held for higher prices later, there are strong incentives to delay repayment. The Wolamo Agricultural Development Unit helped develop its high repayment rates by granting credit for up to one full year. At Puebla in Mexico a successful credit program granted credit for nine months and gave an interest refund for early repayment.

Another contribution to preventing defaults is not to tie loans to inadequate production packages. In Kenya, the greatest reason for failure to repay was that farmers failed to receive the output expected in the official drafted plans on which the loans were based. This was due to both over-estimates of what was possible and failure of the farmers to behave the way the technicians thought they should behave. In Ethiopia, the successful Wolamo ADU was based on a profitable cash crop. The Chilalo ADU had a lower repayment rate but was based on cereals, the prices of which were declining during the period under study. In Japan, government policy to stabilize prices helped repayments on lending to cereal producers. (238, pp. 442-443)

The key to this point seems to be that the farmers' technology must generate the income necessary to pay the loan rather than that a particular type of technology be used. If traditional technologies are insufficient then a new technology must be provided. If a good technology is available, even if traditional, this is a sufficient basis to secure a loan. (97, pp. 287-288)

Joint responsibility for loan repayment has been a big help in encouraging repayment, as in Wolamo in Ethiopia, Puebla in Mexico, in Gambia, in Guatemala and Comilla in East Pakistan, now Bangladesh. (271, pp. 56-58, 63-64; 63, p. B43; 284, p. 21; 279, p. 79) In Bolivia credit delinquency declined in one project when responsibility for collection was transferred from a government agency to a federation of farmers' organizations. (63, p. G22) The most popular and successful form of credit group at Puebla in Mexico was the solidarity group of only three to nine members. (271, pp. 56-57) Thus, very simple organizations are possible. In Thailand, administration of lending was turned over so completely to local authorities in one area that group responsibility for loans was not enforced. Instead local leaders had considerable flexibility to use locally accepted methods to obtain loan repayments. These methods were effective. (285, p. 77) At Puebla also there was no evidence that any solidarity group ever lost its ability to get credit because of non payment by a member. (63, p. 59) A private fertilizer company near Mexico City in Mexico got a 98.5 percent repayment rate on character loans from small farmers in groups of five to fifteen farmers. After the farmer repays his first loan, his repayment record is the basis for granting further loans. (59, p. 14)

For joint responsibility to work there must be an organization of farmers that is the unit of responsibility and this organization must genuinely be responsible in the sense that a committee representing the organization must be responsible for assessing

credit needs. The organization must have the power to enforce action against defaulters. (275, p. 687) Where, as at Comilla, land holdings were unequal and willful defaulters were a problem, farmers tried to get the government to eliminate joint responsibility. (279, p. 79) Instead, it might be preferable to treat early losses as a cost of learning to run the system. (274, p. 295) This would allow societies to expel willful defaulters and thus develop acceptable repayment rates. More complete farmer administration of loan programs would also drastically reduce the administrative cost and tedious procedures of small farmer loans which not only discourage lenders from making such loans but also antagonize borrowers. (271, p. 87)

For credit systems that insist on some form of collateral, it is always possible to lend money on the crop produced. This was being done in Kenya and India. (174, p. 64) If this is to work as an enforcement mechanism, however, there must be some way of controlling the sale of the farmer's crop. In Kenya, loans were only granted to farmers who had marketed their crop through the cooperative for at least three years and this worked satisfactorily. In Tanzania, Ethiopia and Japan, the cooperatives or marketing boards were made the sole legal outlet for marketing. (286, p. 64; 238, pp. 442-443) To control the problem of defaults due to conditions beyond the grower's control, there may need to be some system of crop insurance such as the one required by the Kenya lender mentioned above. Compulsory insurance was not, however, popular with borrowers at Puebla in Mexico. They felt it protected the lender rather than the farmer. (271, p. 87)

It is clear that credit can be safely made available even to small farmers. However, this works best when the farmer is allowed to define his credit needs and the farmers are responsible for the lending operations and repayment. Down payments for inputs and collateral do not increase repayment rates when granted under the above conditions and when the farm technology used is adequate to increase farm incomes. Down payments and collateral do, however, exclude the farmers who need credit the most from the program. Credit will not reach the small farmer unless a decision is made to direct credit towards small farmers and unless other policy changes necessary to achieve this objective are made.

D. Marketing Policy

Marketing concerns the monetized exchange of goods and services. There is a market sector in all countries where there is exchange of goods and services for money. In some countries the markets are run by the government; in others, by private enterprises; in still others, by a combination of the two. Combinations may mean some markets are purely private or public, or it can mean a system of quasi-private institutions, like cooperatives, which are tied into marketing boards or public trading corporations.

Regardless of the form and ownership of markets, certain characteristics are common to all marketing systems. They must provide for the movement, storage, collection and distribution of goods. When goods are perishable, provision must be made for preservation or speedy processing and distribution. When goods are not sold to consumers in the same form as they are obtained from producers, marketing must see that these goods are routed to and from intermediate processors.

Sometimes marketing is an independent activity, e.g., small traders who buy direct from producers and sell direct to consumers. In many cases, however, marketing is integrated in some way. Producers or consumers may operate part or all of the marketing system. Marketing cooperatives are an example of such a system. The marketing system itself may be integrated but be independent of producers or consumers. Finally, there are many mixed cases, e.g., where marketing is independent but there are tie-ins, e.g., preferential credit arrangements or monopoly, between part of the marketing system and producers or consumers or other parts of the marketing system.

No matter who performs the marketing functions or how these functions are organized, each marketing operation -- transportation, storage, processing, information gathering and risk bearing -- has costs which must be paid. (245, p. 68) Thus the marketing system must either be designed to cover these costs or a system of subsidies must be created to provide for their payment. Farmers and government officials must recognize the existence and legitimacy of such costs. (245, pp. 74-75)

1. <u>The Role of Marketing in Developing Agriculture</u>

Without markets, there will be no agricultural development, as nowhere has barter provided a basis of exchange sufficient to support a modern agriculture. But markets must do more than keep pace with increased agricultural production. In fact, marketing expands much more rapidly than either agricultural output or gross national output in most developing countries. (287, pp. 9-10; 203, p. 32)

The reasons for this are easy to see. In an agricultural economy where some proportion of agricultural output is produced by farmers for their own use but this proportion declines as the farmers' incomes increase, the proportion marketed will increase faster than total output. (270, p. 80) For instance, a farmer may grow 100 bushels of corn of which 80 bushels are consumed by his family, 20 bushels sold. If he grows 120 bushels, he may sell 30 bushels and consume 90. Thus a 20 percent increase in production means a 50 percent increase in marketing. (287, pp. 9-10) This decline in the proportion of subsistence production during development is the normal state of affairs in agriculture the world over.

The tendency for marketing to increase faster than agricultural output is reenforced by other factors. As production increases, more purchased inputs are used and these represent an addition to the sum of marketed goods. As confidence in the market system grows, farmers may choose to specialize in cash crops resulting in increasing proportions of their output passing through markets. Finally, government policy may deliberately favor market participation by taxing land or farm production and thus forcing farmers to increase marketing in order to pay taxes.

Markets are the means whereby prices, a key aspect of the incentive system for farmers, reach the farmer. Without expanding markets -- either domestic or foreign -- at reasonable prices, there will be no reason for farmers to expand production. (263, p. 45) Farmers expand production in order to get the income to buy consumer goods. A lack of consumer goods discouraged agricultural production as in Zaire, for example. This buying of consumer goods, in turn, increases demand in consumer goods industries and spurs their growth. (102, p. 108; 246, pp. 596-597; 105, p. 270)

All too often the multiple effects of marketing on agriculture are neglected by policymakers. As a result, incentives are low and inputs for farming are scarce, expensive, unavailable, or late. In many cases, the best investments in agriculture may be in agricultural marketing rather than directly in increasing output. (288, p. 111; 289, p. 133; 246, pp. 596-597)

Marketing, however, is a difficult system to comprehend, plan for and improve. When a policymaker examines the agricultural marketing system in his country he usually sees inadequate storage, inadequate transportation, a lack of uniformity in weights and measures, no standards for grading produce, inadequate credit, an almost complete lack of processing, and no system of market information. (276, pp. 28, 33; 51, chapter 3, p. 64; 263, p. 25)

That all these problems exist does not imply that the government should attempt to solve all of them at once. For instance, uniformity of weights and measures and a system of grading are prerequisites for an effective system of market information for all but the most homogeneous of bulk commodities. Transportation development will usually precede the development of agricultural processing industries. A high yielding varieties strategy must be supported with input supplies. However, once farmers begin to adopt the new varieties on a wide scale, storage and transportation will become more critical as the increased output has to be stored and moved to market. Weights, measures and grading will be less critical because grains are relatively homogeneous and traditional marketing systems can handle the existing quality variations.

If the strategy involves diversification or export promotion, priorities will be different. For exports and perishable products, weights and grading are critical and marketing laws to establish standards for these crops may have to precede all other measures.

Timing is often more important for export crops and perishables than for other crops, so all stages in the marketing chain may have to be more exactly controlled than is necessary for bulk crops. (262, p. 366) This requirement for tight control for export crops and for perishable crops, like fresh vegetables and cut flowers, has led to the development of a systems approach to commodity marketing for such products. A commodity systems approach has been developed based on export programs from some Central American countries. However, such a systems approach assumes that the marketing system can be entirely rebuilt if necessary. Although governments frequently act as if they want to completely rebuild marketing systems, e.g., when they take over trade in certain commodities, experience shows that this is rarely possible if the marketing system is to work well. In fact, the system often works better if trade is returned to private hands as happened in fertilizer retail in Pakistan. (244, p. 68)

Governments should build on the marketing systems that already exist by deciding what national objectives they want marketing to contribute to and then concentrating on getting markets to make those contributions. (234, p. 19) This may mean that traditional markets will be improved in specific ways or that new marketing systems will be developed but only for the crops that require it.

If sound improvements in existing marketing systems are to be made, a first step is to obtain some idea of what the existing marketing system is and how it works. (263, p. 26; 9, p. 58) Developing countries often lack such information so a market survey may be necessary. (276, pp. 28-29) In Costa Rica, for instance, a special task force was created to study agricultural marketing. (290, p. 7) Particular emphasis should be put on how the marketing system affects the incentives faced by the farmer as the impact on agricultural output is a major concern in making market improvements. In some cases, retail marketing will also be a significant concern, as in Zaire. Demand studies are especially important when export crops are being considered. (276, pp. 57; 291, p. 7)

2. Traditional Marketing

In all developing countries there is some form of traditional marketing, usually in private hands, that is well established in the countryside. (224, p. 7) In many countries these markets handle primarily the surplus production of subsistence producers. This means that, on one hand, farmers are little affected by market prices or other market incentives since they don't produce for the market. They simply sell surpluses there. (292, p. 365; 259, p. A70) the other hand, farmers are likely to sell their produce immediately after harvest for less than they would receive if they could wait. (277, p. 21; 262, p. 367) The buyers, in turn, often have small storage facilities since the average surpluses sold are small. As a result of the low overall storage capacity and seasonal sales, price swings are often wide. (276, p. 33; 51, chapter 3, p. 64) This instability makes the farmer even less interested in producing

for the market and less influenced by price incentives as price fluctuation increases the risk of investing in increased output. (292, p. 365)

The conditions which make a farmer a subsistence farmer are largely beyond the control of the merchant. Land tenure may play a big role if it limits the returns to farmer efforts. Low prices for farmer output and low demand prevent farmers from seeking higher incomes by expanding production. (293, p. 2) The lack of consumer goods and services to buy make higher income less meaningful for the farmer. The lack of inputs and technologies that would provide adequate returns to the farmer also discourage market participation. All these things are beyond the control of the marketing system. No amount of market reform or government procurement will encourage increased farmer marketing unless these conditions are remedied.

There are some incentive defects which are clearly related to the market system, however. Above we mentioned price fluctuations due to poor storage and short selling seasons by farmers as well as the unstable nature of surplus sales. Price instability was caused by vacillation in government policy in Brazil. Poor inter-market integration is also a problem. Even where local markets are fairly well integrated with more central national markets, they may be largely uncoordinated with each other leading to large price differences between regional or local markets.

This lack of lateral coordination is due to the pyramiding structure of markets. After a merchant buys and collects a product at one level, e.g., from the farmer, he moves it to the next higher level where it is sold to another merchant who similarly collects from lower levels and sells to higher levels. This structure continues up through several middlemen to processors, major cities or export markets. This structure allows each middleman or woman to personally inspect the produce bought. In Ghana, for instance, there were three middlewomen between sorghum growers and a beer producer 60 miles away. (294, p. 111) In Ethiopia, there were an average of four to five middlemen between the farmer and retail sale or an assembly point for export in Addis Ababa. Such market structures orient the whole market system towards major collection points and tend to overlook inter-market differences within the economy.

The combination of market fragmentation and unstable prices has hurt many agricultural development projects. If the project leads to increased production there is an especially large drop in price. This is because of the low capacity of the local marketing system to handle large quantities and the isolation of each local market from other local markets. This problem has discouraged agricultural development, or led to the inclusion of marketing schemes in agricultural projects, all over the world. (295, pp. 102, 110; 296, pp. 326, 391-392)

3. Marketing Reform

The role of demand and markets in expanded production is perhaps most clearly seen in the differences between the role of markets in the expansion of largely subsistence crops and of cash crops. Other than the recent cereal successes based on high yielding varieties, the major successes in agriculture have been reforms in the marketing of particular cash crops such as cotton, tea, coffee, cocoa, sugar, tobacco, groundnuts, rubber and palm products. Although a variety of types of production organization are responsible for these successes, everything from plantations to both highly supervised and relatively unsupervised small farmer production, there has been one common factor in the existence of highly organized marketing systems to supply a growing demand in each case. (234, p. 30)

In many cases marketing organizations sought out willing farmers and trained and financed them. (277, p. 40; 278, pp. 54-55) In Bogota, Colombia, for instance, the Carculla Company provided help to growers of perishable fruits and vegetables for its stores. Other stores then began developing their own suppliers. In Puerto Rico, a supermarket chain fostered a similar system for eggs. (297, p. 7) The development of processing facilities led to expanded marketed output in many cases, e.g., the establishment of sugar mills in Greece, Iran, Sudan, Uganda, Kenya, Tanzania, Pakistan and Chile led to the creation of a marketing system and expanded sugar production. (288, p. 109)

These marketing and processing facilities developed before agricultural output increased. This was because significant marketable surpluses were not produced until markets became available. (288, p. 109) But this meant that marketing facilities had to be prepared to accept losses during the early years of their operation. Thus it is not surprising that marketing-and-processing-led agricultural development has been associated with high value cash crops; it is these crops that justify the high initial investments involved. This also explains the frequent participation of governments, foreign investors or large companies in the development of such processing and marketing facilities. These organizations can afford these large investments. These investments can be reduced if the marketing project includes provision for developing agricultural output along with processing and marketing facilities. A sugar mill in India accomplished this by growing sugar cane on a plantation basis until local growers became sufficiently interested so that the cane growing operations could be turned over to them.

Starting small and expanding may work where economies of scale are not so significant as to render a small operation unprofitable. This has worked well in exporting out-of-season vegetables and flowers from Central American countries to U.S. markets, for instance. Similar opportunities have been exploited in the Mediterranean region for sending fruits and vegetables to European countries.

4. Standards, Grades and Market Information

One important step in improving the marketing of most agricultural products is providing standard weights and measures. In Ethiopia, most exploitation of farmers at markets was due to false weights and measures. (286, p. 53) Once the farmers' knowledge of weights and measures developed, they demanded that standard measures be used. In India farmers preference for markets where standard weights and measures were in effect drove non-complying markets out of business. (276, p. 15) Thus the introduction of standard weights and measures was self-enforcing in these cases. For this to come about, however, there must be both a marketing law to establish standard measures and information programs to make farmers fully aware of how they can use the law. In Ethiopia, for instance, the Chilalo Agricultural Development Unit made weights and measures available to farmers for dealing with private traders.

Almost as important as standard measures are standard grades for produce. (298, p. 3) As markets develop it becomes important that buyers by able to contract for commodities on short notice and at long distances. Since these conditions mean that the buyer cannot personally inspect the product, there must be standard grades reliably used if such transactions are to be made. The alternative is to continue the traditional chain of middlemen where each one can personally supervise the quality of commodities bought and sold.

The introduction of standard grades facilitates the development of production and the reduction of wastage. In Colombia, private buyers developed a system of uniform sorting and packaging for the producer associations that supplied perishables for retail markets. In Puerto Rico the Department of Agriculture instituted uniform size and quality standards for eggs, which made possible greatly expanded egg production. (297, p. 7) Grading can drastically cut wastage as products which are waste to an urban market may not be waste in a rural market or if culled from the marketing chain sooner. Even unacceptable products may become livestock feed if separated soon enough. (278, pp. 34-35)

The need for grading and measurement standards is increasingly being recognized and marketing laws are being passed. (299, p. 85; 277, p. 30; 262, p. 366) In Pakistan, compulsory certification of wool has allowed expanded wool exports and improved prices since direct buyer inspection before shipment was not practical. (292, p. 390) Kenya tea growers, for instance, got a good financial return for a graded high quality product. Meanwhile, tea growers in Bangladesh petitioned the government for a subsidy because production costs were ten percent greater than revenue. This was because producers had been directed towards quantity rather than quality production. (300, p. 60)

Benefits from grading have not, however, been universal. In Latin America, some grain buying was by grade but sales were not, so it was difficult to convince farmers that buying by grade was justified. Clearly the justification of grades and standards depends

on their usefulness to the trade and hence their ability to generate higher returns to farmers for graded produce. (278, p. 27) Standards for bulk grains will be hard to justify until long distance and a significant quantity of trade develops.

The primary purpose of grading is to facilitate communications where personal inspection is not practical. But simply grading produce serves no purpose if information about prices and grades is not available to buyers and sellers. Grading helps marketing only if buyers are aware of what is offered and sellers are aware of what is wanted, i.e., where and when prices for particular grades are high and low. Grading makes the transmission of such information practical since produce can be described in terms of standard grades rather than by having each lot individually described by the seller.

Not only do grades make improved information possible, but improved information forces producers to adopt the grading standards in order to sell their produce or get higher prices. (276, p. 15) Thus extension services should be prepared to provide information to farmers on grading systems as this becomes important. (298, p. 3)

For market information to be useful, it must be timely. Prices often change rapidly and produce may spoil. Buyers and sellers need information that is current up to the day and, in some cases, even time of day. Thus it is important that market information programs be established that will make farmers aware -- if farmers are aware, generally you can be sure buyers will be -- of what prices are currently being offered, or what official prices are. Where transportation costs are a big factor in farmer prices, these also need to be well publicized so farmers can discount the central market prices that are officially quoted. The urgency of this need is shown, for example, in Malawi where a survey found that three-quarters of the farmers surveyed did not know even the official price for corn. In many countries high transportation costs and poor information mean that farmers must sell their crops for whatever price is offered when transport is available. Poor information is also a major cause of price discrepencies between rural markets.

Another type of market information is also important. This is information on long term prices and price expectations so that farmers can plan crops to be harvested at future dates. (262, p. 365; 277, p. 30) Information on future demand and prices is also important to officials conducting price stabilization operations. (262, p. 389; 243, p. 126) Such information should be as clear, accurate and precise as possible and far enough in advance so that the farmer can use it in his farm planning. (262, p. 366; 292, p. 366; 144, p. 54)

5. Summary

In practice, marketing reform has been most successful when it has proceeded on a crop-by-crop basis. As a processor or international market develops, so do marketing facilities and

organizations, standard weights, measures and grades and improved marketing information. The first step in planned market improvement for crops that cannot support their own marketing system would be standard weights and measures. This is a key step in increasing producer confidence, and hence output, and is the basis for later improvements in grading of produce and market information. Grading should follow on a crop-by-crop basis as differences in the conditions of crop sales lead buyers to willingly pay more for higher quality. Market information services will be useful wherever price differences between markets are significantly greater than transportation costs. Information also depends on accurate description, however, so some information programs may not be practical until standard systems of grading have been introduced.

E. Employment, Mechanization and Technology Policies

1. The Problem of Unemployment

Unemployment and under-employment are growing problems in developing countries. Where the seasonal nature of agriculture prevents unemployment from continuing throughout the year, under-employment is still a problem. In Mexico, the number of days worked by farm laborers declined between 1950 and 1960 from 190 to 100 days per year. (204, p. 42) Similar conditions exist in many other countries. In many cases such under-employment is coupled with labor shortages during certain critical times during the year. Rural-urban migration is also a problem. Urban areas attract rural workers but modern economic activities are relatively capital using, so urban employment grows slowly. Migration means moving the unemployment problem and perhaps worsening it, not solving it.

Under- and unemployment are often caused by increasing population. Even in countries where over-population is not yet a problem, rapid population growth may contribute to the unemployment problem by producing workers faster than jobs can be created. For instance, Nigeria's population is increasing about 1.5 million a year at a time when it is expected that industry will generate at most 220,000 jobs over a twelve-year period. (137, p. 54) In Mexico, it is expected that the number of farm workers will double between 1960 and 1980 but the number of farm jobs is declining. (204, p. 42)

Labor surpluses are also due to government policies which encourage labor-replacing mechanization, e.g., subsidies for mechanization as in Pakistan or government capital intensive production schemes, and to reduced demand for farm output caused by low food prices or policies which discourage exports. (301, p. 134; 206, p. 14; 137, p. 35; 302, pp. 20, 30)

If the unemployment problem is to be solved, many of the new jobs necessary will have to be created in agriculture. Some developing countries, such as Korea, have created sufficient

non-farm employment so that the absolute number of workers in agriculture is declining. This, however, is not typical. The Ethiopian government, for instance, has stressed in its planning the need for agriculture to employ much of the rapidly growing labor force in the years ahead. India is faced with increasing rural unemployment and no prospect of major transfers of labor to nonagricultural employment. (Economic and Political Weekly, Vol. 8, 303, p. 2208; 304, p. 2235) In most of Asia, agriculture will have to provide more employment in coming decades. (206, p. 14) The Report of the Commission on International Development (The Pearson Commission) concluded that agriculture will have to bear the burden of absorbing most of the increases in labor supplies of developing countries. (305, pp. 59-60)

2. Mechanization and Employment

If a country is to be successful at significantly reducing agricultural under- and unemployment, reconsideration of its policies affecting mechanization is likely to be required. Although awareness of the employment problem is growing, e.g., as measured by the extent to which employment goals are set in development plans, changes in policies towards mechanization have been much slower in coming. (166, pp. 153, 165) Where policy turned against mechanization in South America, it was because of foreign exchange constraints rather than a preference for labor-using technologies to provide employment. (306, p. II-20)

Sri Lanka stopped most tractor imports due to foreign exchange shortages. In Africa, some tractor mechanization schemes failed because of rapid wear and corrosion coupled with poor maintenance, poor operation and management and inappropriateness for African soils, ecological conditions and size of fields. (302, p. 21) In Spain, and in other countries, mechanization was inhibited by farm plot size and increased operating costs. (243, p. 12) If headway is to be made against unemployment, however, there must be serious consideration of what types of mechanization are desirable and under what conditions rather than reliance on fortuitous local circumstances to reduce the problem.

Currently, developing countries have many policies that favor mechanization. Over-valued exchange rates, inflation, subsidized credit, and tariff and tax exemptions all tend to make mechanical equipment artificially cheap for potential mechanizers. (307, p. 16; 203, p. 58; 205, p. 38) Such policies often favor imported over locally produced equipment. (166, p. 154) There are also subsidies on operating costs such as fuel, repair centers and driver training. (302, p. 21) Crops which lend themselves to mechanization enjoy special price or subsidy advantages. (137, pp. 38-39; 205, p. 38)1/

1/ For a more extended discussion of these points, see 166, pp. 154-157.

Thus, mechanization is frequently profitable to equipment users, but this is only because of the various subsidies.1/ Without these subsidies, i.e., from a social point of view, much mechanization cannot be justified. (137, p. 39; 307, pp. 16-17; 166, p. 155; 203, p. 58; 302, pp. 22-23)

Sometimes such mechanization policies are part of a consistent overall development scheme, e.g., in Korea. However, often the mechanization bias of policy seems to be an accident or to be due to a mistaken notion that mechanization is the only way to modernize. (206, p. 15; 61, p. 61) For instance, in Latin America, although farm machinery is usually exempt from import tariffs and domestic production enjoys tax exemptions, necessary spare parts are subject to heavy duties. (166, p. 155) In Sri Lanka, shortages of imported spare parts have immobilized many expensive imported tractors. Many mechanization schemes in Africa, promoted by governments trying to modernize agriculture rapidly, have turned out to be costly, failures, or both, e.g., in Zaire, Uganda, Tanzania, Sierra Leone, Ghana and Nigeria. (302, p. 30)

The result of the mechanization bias of policy has been widespread replacement of labor by equipment. This is especially true in Latin America but also in other areas. In West Pakistan mechanization reduced labor use per acre about 50 percent. In the Indian Punjab, the man days per acre required for wheat on well-irrigated 10-acre farms rose from 33.4 to 42.5 with the introduction of high yielding varieties but fell to 18.1 man days per acre when tractors were used and 12.1 man days per acre when both tractors and wheat reapers were used. (205, p. 38)

Where mechanization has already progressed to a significant extent and unemployment has risen, social unrest has developed. Tenants are evicted and farm workers are displaced by equipment. (308, p. 5) The profits from subsidized production on large farms lead large holders or outsiders to buy up small holdings as has happened in India, Pakistan and the Philippines. (61, p. 91; 205, pp. 24-25; 259, p. A74) If wages rise, landlords may increase mechanization which will aggravate tensions with workers or cease making payments in kind or providing other traditional benefits. (205, p. 43)

a. Labor Using Mechanization

Some mechanization is not labor replacing. The use of powered pumps can have a major employment impact by allowing more intensive use of the land. In Afghanistan, for instance, 750 hectares

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1/ In Pakistan, the combination of no tariffs, an over-valued exchange rate and high support prices for wheat (double the world price) meant farmers have to pay only half the amount of wheat for a tractor that farmers have to pay elsewhere. (205, pp. 38-39)

were irrigated by pumps powered by a small hydroelectric generation plant so two villages could double-crop what had been grazing land. (309, p. 3) To take advantage of the potential of water development, India reoriented its rural electrification priorities toward areas where underground water could be developed for irrigation. (203, p. 28)

With commercial crops, the need for accurate grading, rapid response to orders and shipping of products while fresh may make mechanical graders essential if producers are to keep their market, e.g., an Indian cooperative proposed the purchase of a mechanical size-grader for onions for this reason. (309, p. 5)

Multiple cropping often demands rapid harvesting and threshing of one crop and soil preparation for planting the next crop at the same time. (310, p. 18) In India, bullock and human power were not always able to cope with the demand for speed, especially on larger farms. (311, pp. 991-992) As a result, mechanization was introduced in conjunction with high yielding varieties. Total labor demand rose by 14 percent even though tractors and electric pumps reduced the labor needed for traditional varieties by more than 50 percent. (213, p. A135) The shortage of bullock power was especially acute because bullocks were used for both threshing and tillage. Since the high yielding varieties both raise output and allow multiple cropping, threshing and cultivation needs go up sharply and at the same time. (205, p. 37) Time becomes even more critical when three or four crops are grown successively. (309, p. 2)

Rain and other weather conditions also increase the returns to rapid tillage. In Turkey, trials over twelve years showed that planting cereals in October rather than November increased output 38 percent. In Zambia, delaying planting a week after the rains started reduced the yields of groundnuts and maize by 500 to 700 kilograms per hectare. In Kenya, maize planted to take advantage of early rains yielded 54 percent more than maize planted 28 days later. Tractor use proved to be employment-creating in the Mvea irrigation scheme in Kenya. (309, p. 2) In Thailand, tractors can plough before the monsoon rains, a job that buffaloes are too weak to do, resulting in a net gain in labor use of 20 to 30 may days per hectare because rice can be transplanted, a labor-intensive activity, rather than broadcast. (309, p. 2; 205, p. 36)

These types of mechanization are labor-using because, by overcoming labor constraints that exist at particular times of the year, they allow production of crops that greatly increase labor demand during non-peak periods. Increased labor use is especially likely when mechanization permits multiple cropping, as when power is used for threshing, tillage or irrigation. (206, p. 15; 212, p. 105)

Mechanization, however, permits multiple cropping only where land is scarce or irrigation, though needed, is limited to certain areas. Where good land is plentiful, tractor mechanization is much more likely to be labor than land saving. (312, p. 22) Even

in irrigated areas, there may be no justification for tractors if multiple cropping is not putting a premium on harvest and planting speed. (197, p. 17) This was the case, for instance, in parts of Sri Lanka.

Furthermore, if output increasing mechanization is to help all farmers, special provision must be made for making it available to small farmers. Intermediate degrees of mechanization should be used. Tractor hire schemes can be established although in Nigeria and Tanzania these were costly and inefficient. (212, p. 117) In some areas of Thailand, the government helped farmer groups jointly purchase tractors. (313, p. 18) Governments must provide for equal access if mechanization is not to lead to increasing rural inequality. (312, pp. 29-30)

Even if harvesting-planting speed is important, small scale, locally made threshing machines to mechanize harvesting may be preferable to tractorization of planting. (61, p. 62) Improvements in plows and introduction of harrows for bullocks can save planting time. In India, the moldboard plow and a modern harrow reduced seedbed preparation time to 18 hours compared to 94 hours for the traditional plow and plank method. (61, p. 62) Hand operated seed drills can speed planting, reduce wastage and make weeding much easier, as has happened in Portugal. (314, p. 21) Where tractors are necessary, two-wheeled rather than larger four-wheeled can be used. In Taiwan, these have reduced the labor in seedbed preparation but increased total employment and farm income by increasing the number of crops that can be grown. (212, p. 106; 309, p. 3)

On coffee estates in Kenya, use of herbicides and mechanical applications of inputs has reduced non-harvest labor while increased yields have increased harvest labor. The result is that a permanant labor force has been transformed into a casual, seasonal labor force. (315, p. 68) Weeding can be a labor-intensive activity because there is little other need for labor when weeding should be done. If mechanization of this task is encouraged, fairly simple hand operated weeders can be provided. (61, p. 60)

Mechanization may be labor-saving, labor-using or both with a net employment effect that depends on factors such as the degree of land and water scarcity, the practicability of using high yielding varieties or growing cash crops and other factors. Regardless of whether increased employment is a primary or secondary goal, it will be necessary to look closely at the local circumstances and develop a mechanization program to fit.

3. Alternatives to Mechanization

With few exceptions, traditional agriculture in developing countries has been carried out with labor-using technologies. At the same time, output per worker has been low. Mechanization has helped increase output per worker but frequently by decreasing the number of workers employed. Thus, in addition to adopting

more selective mechanization policies, governments which want to increase employment will also want to consider technologies which increase output while also increasing employment.1/ (206, p. 14)

One way of increasing both output and employment is to foster the substitution of high value, more labor-using crops or livestock for traditional food crops.2/ In Kenya, for instance, increased employment has been one of the major benefits of the smallholder tea project. Tea is extremely labor intensive and difficult to mechanize. As a result, it has provided considerable employment for both the growers and for casual labor from the surrounding areas. Tea growing has also created considerable employment in tea factories, marketing and with tea-linked industries, e.g., transport, fuel supply and small-scale activities like production of bags and baskets. Cotton production in Mali attracted large numbers of seasonal workers and significantly decreased the number of young men who were leaving the villages to go to the capital. In Guinea and Liberia, the employment effect of expanding iron ore or bauxite exports was found to be negligible compared to expanding exports through smallholder production of export crops. (137, p. 41)

Another way of increasing both output and employment is to adopt more labor-using cultivation methods, i.e., biological improvements for food crops. (242, p. 7) Diversification can spread labor demand out over the year as well as increase employment. (238, pp. 476-477) The largest possibility in this field lies with the new high yielding varieties. (205, pp. 12-13) Because these varieties have shorter and more flexible growing seasons, they allow growing more than one crop a year on the same land. This means labor demand can expand with the intensity of cropping. (310, pp. 16-17) In the Pakistani Punjab, roughly proportional expansion of labor use and cropping occurred. (205, p. 20) Other studies found increases in total labor requirements from 10 to 60 percent due to high yielding varieties. (212, pp. 103-104) In Ludhiana, India, agricultural labor wages rose significantly and employment became available all year around due to the high yielding varieties that were used in the area. (205, p. 29; 212, p. 104)

1/ Some experts disagree with this, arguing that productivity per man is more important than increased employment. (36, p. 150) However, as long as output increases more rapidly than employment, both can be obtained. This requires that employment programs include efforts to increase agricultural output. (49, p. 16)

2/ Livestock expansion may not have a significant employment impact. For instance, range management schemes in Kenya had a negligible direct employment effect.

The high yielding varieties increase employment in other ways. (205, p. 17) In the Philippines, the increase in labor requirements was estimated to be 30 to 50 percent due to the use of new rice varieties even without multiple cropping. (205, p. 17; 310, pp. 16-17) In Taiwan, labor work time doubled while the ratio of area planted to cultivated land area rose from 1.32 to only 1.98. (205, p. 21) This is because cultivation practices are more demanding for high yielding than for traditional crop varieties. There is increased labor demand for tillage, application of fertilizer and pesticides, weeding, water control and harvesting, unless labor-saving mechanization reduces labor demand.

The potential for even greater increases in employment exists. In Japan and Taiwan, farmers use about 170 man days of labor to grow and harvest high yielding varieties of rice while Indian farmers use about 125 man days and 100 man days are used in the Philippines. In spite of this, output per man, and hence farm income, is higher in Japan and Taiwan than in other developing countries and is higher for high yielding variety growers than for growers of traditional varieties in all these countries and in Turkey and Pakistan. (212, p. 104)

In Japan, the use of new cultivation practices, improved varieties and fertilizer (the second highest concentration of fertilizer in the world), coupled with pumps, better animal-drawn plows and harrows, weeders and pedal threshers have been the basis for a remarkable rise in yields. (47, p. 106; 205, pp. 34-35) In 1961, farmers devoted 523 man days per hectare to all farm operations even though they had a considerably higher level of mechanization than is typical of developing countries. (310, p. 17)

Expanded and improved use of animal power is another alternative to mechanization. In much of Africa, the increased use of draft animals is one of the more promising ways of increasing the amount of power being applied to agricultural tasks. It can also expand labor use by extending the area under cultivation. (231, p. 38; 302, p. 25) Increased use of animal power can be more economical than expanded use of land, labor or tractors, although this has not always been the case. Thus the use of oxen is growing, though slowly, in Zambia. (43, p. 133) Even in a densely populated area like Bangladesh, the farm manager for the Mymensingh University farms found that, although he had been instructed to mechanize, he could not work the farm effectively without twenty-two oxen. (43, p. 117) Animal power has the further advantages of economizing on expensive fuels and providing many usful products such as milk, manure and eventually meat and hides.

Some of the potential of animal power lies in improving the technology of animal drawn equipment. (312, pp. 29-30) In Ethiopia, because tractors were both socially undesirable, as they led to tenant eviction, and did not offer significantly increased yields or reduced cost, the Chilalo Agricultural Development Unit decided to concentrate instead on improved animal-drawn farm implements that could be made and repaired by local artisans. As a result,

they developed a new hand hoe and a stationary thresher and introduced wheelbarrows and ox carts. Such tools reduced costs and increased yields compared to traditional methods. An attempt to introduce an improved version of the local plow had only limited success.

4. Non-Farm Employment

It is unrealistic to expect agriculture to solve all of the employment problem, however. Even in cases of large scale land reform, such as in Japan, it is rare that everyone gets enough land to be a fully employed farmer. If the employment problem is to be solved, other solutions are needed.

a. Rural Public Works

One solution to the under- and unemployment problem is labor-using rural public works to build infrastructure in rural areas. Simple, labor-intensive projects can be adjusted to fit between peaks in the need for agricultural labor thus avoiding a drop in output. This has the virtue of turning the unused labor into an asset and worked in China and Pakistan. (76, pp. 246-247) India, Tunisia, Korea, Indonesia and other countries also had such programs. (85, pp. 19-20; 247, p. 106) In some cases rural works programs were supported by sales of PL 480 supplies of grain, as in Tunisia and East Pakistan. (244, pp. 62-63) In most cases, however, the country will have to finance the program and this makes it especially urgent that the program not be just a welfare program but contribute significantly to growth in output.1/

Public works programs which create productive infrastructure such as roads, canals and public buildings, lay the basis for generating further employment in agriculture, services and industry once the program itself is complete. This is essential if such works are going to do more than delay the unemployment problem rather than solve it. (259, p. A74; 85, pp. 19-20) Ethiopia, for instance, established new settlement areas for farming by substituting under-used cheap labor for bulldozers in land clearing.2/ Rural

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1/ This is not to imply that the PL 480-supported programs were not productive. On the contrary, the East Pakistan program produced an extensive array of roads, canals and dikes.

2/ In addition, labor turned out to be less expensive than heavy equipment for this type of land clearing.

public works have provided training in needed skills in Bangladesh. Construction is an excellent example of a labor-intensive, relatively low skill type of job, much of the training for which can be developed during the works programs. (316, p. IV-16) Contracting, record-keeping, planning, supervision and repair work skills can also be developed this way. (317, p. 6)

If public works programs are to be self-financing to any significant extent, it is necessary that they be undertaken in a context of rising agricultural productivity. The returns to the public works investment will be much higher when followed by rapid changes in technology and increased agricultural output and marketings than if agriculture remains relatively stagnant. (85, pp. 19-20) Thus, to get the full benefit, rural public works must be coordinated with input supply development and other rural services.

If public works programs are to be successful, they must be designed to fit the environment. Following a rural public works program in India, newly planted trees died and roads were buried by sand because the projects which were really needed to provide water were omitted. In other places, trees were used as forage, or planted areas were fenced thus reducing forage, or roads were washed out by rains. Not only must implementation be carefully planned and supervised, but both must be done on a regional and local basis to insure that projects fit local conditions and needs. (Ahuja, Kanta. "Agricultural Underemployment in Rajasthan." 318, p. A106) The local development committee approach (see Extension chapter) used in the East Pakistan Rural Public Works Program was well suited to this need.

Since labor is the major cost in rural works, it must be closely supervised. Basing wages on performace has worked in some cases. However, this would be unfair to, or would even exclude, some of the people who need help the most where malnutrition is a problem or where many of the unemployed are women, the sick, or the very young or old. Providing a meal during the work day has been found to increase productivity a great deal on some projects.1/

b. Other Sources of Employment

Although rural public works sometimes have a tendency to become permanent because of rising unemployment or political pressures, they are not a permanent solution to employment problems. Even where programs are long term they shift from area to area as the most useful projects are completed and allocations to particular areas vary from year to year. As more marginal projects are

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1/ In Ethiopia, a Food for Work program was one of several programs which constructed hundreds of kilometers of bench terracing for reforestation.

undertaken, the program becomes less self-supporting and more of a burden on the rest of the economy. Only China seems to have been able to escape these problems sufficiently to maintain continuous public works programs in rural areas. Generally when there is insufficient agricultural employment, there must be alternative sources of non-farm employment in addition to public works.

If the public works have been well designed, they will have laid the basis for much non-farm employment, as well as much farm employment. Roads will increase demand for transportation. Higher incomes will increase the need for commerce and construction. Much of the increased income will be spent on food which will increase the prosperity of farmers and increase their demand for labor. All these activities will spur the demand for other activities and create many new opportunities for local people to start or expand businesses of all sorts. (85, pp. 19-20)

In many countries, a considerable amount of a farmer's time is already spent on non-farm economic activities such as crafts and trading. (307, p. 11; 231, p. 26) If rural income grows, these activities should also increase.

Processing of agricultural products, marketing and input supply are other ways of expanding employment.1/ (97, p. 60) Cash crops are especially likely to have processing requirements, e.g., curing tobacco on the farm requires not only curing work but also maintenance of curing buildings and provision of firewood. (166, p. 159) Bread baking was a rapidly growing industry employing an estimated 165,000 people in India. This growth was spurred by the expansion of wheat production. Unfortunately, much of this growth may be reversed as a result of a recent Canadian loan for the purchase of five automatic bread-making machines. (205, pp. 52-53) The use of high yielding varieties has generated considerable employment in input supply, marketing and distribution and through increased demands on linked industries. (205, p. 52)

If mechanization is to be undertaken, further employment can be generated if the machines used can be locally made and repaired. (19, p. 5) Tractors will often be imported or produced in large

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1/ In a partially or wholly subsistence economy where higher output is accompanied by a reduced proportion of subsistence production, the amount of produce marketed -- and thus requiring commercial and other services many of which are labor-intensive -- will rise faster than growth in output even when there is no increase in purchased inputs or processing. Thus, it is not unreasonable to believe, as some have suggested, that high yielding varieties will create more employment indirectly through services than they do directly on the farm. (205, p. 52) See Marketing section.

capital-intensive factories. Tools and simple animal-drawn implements can be made by local artisans. (309, pp. 3-4) Threshers can also be manufactured locally. (205, p. 37) Even simple pumps and diesel engines can be manufactured in local labor-intensive factories. For instance, in Dasca, a city in the Pakistani Punjab, there are over 100 small factories producing diesel engines for pumps and mills. (205, p. 52) This industry seems to have grown up by extension of repair activities to encompass the whole engine. In large countries such small-scale activity will add up to considerable demand for materials, machine tools and other linked industries as well. (309, p. 4)

China has gone the farthest with rural industrialization policies by encouraging the development of fertilizer, cement and farm machinery factories in rural areas. Although the output quality is often lower for such factories, it is quite adequate for rural uses and far superior to nothing at all. These factories generate considerable employment, although this is not their intended purpose, and save transportation costs. (79, pp. 92-157)

A great deal can also be done to generate industrial jobs in rural areas through systems of subcontracting of certain types of production to small-scale rural industry and locating industries in rural areas when economies of scale are not critical. Japan has developed enough such industries so that more than one half of the adult family members in rural areas have some non-agricultural job. Taiwan is approaching this level. (85, pp. 18-19) Korea is encouraging the growth of rural industry of a similar type. This may not prove as practical in countries where densities are less and distances greater, though it would still seem appropriate in the vicinity of larger urban centers.1/

Such small-scale activities will not develop, however, if government policies are not favorable. If increased agricultural income is drained out or rural areas by landlords, low prices for agricultural products, or other means, such activities will not develop. Initially emphasis should be placed on making necessary policy and institutional changes. For instance, any significant growth in rural economic activity may require institutions which

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1/ Some people argue that small-scale industry is not an adequate solution because it lacks the economies of scale necessary to make industry competitive. For this reason its employment generating capacity must be limited. (259, p. A74) This, however, has not been the case in the countries which have tried developing small-scale industry in rural areas. Such industry has continued to have a significant role even in such highly developed countries as Japan.

mobilize rural savings but keep them in rural areas. Governments must be prepared to foster such institutions. (316, p. IV-16) Initial projects should be small in scale with quick payoffs which generate the employment, skills and savings necessary for further activity. After this, emphasis should be placed on maintaining the momentum of rural-based development by simultaneous expansion of agricultural output and incomes, agricultural output processing and input supply, e.g., farm tool production, and the whole complex of goods and services which go with rising income and the growth of rural towns.

5. Choice of Technology

Although it is impossible, without examining the specific circumstances, to determine whether mechanization is desirable or how employment in agriculture might best be increased in conjunction with rising productivity, certain general principles do emerge to help guide the way to such decisions.

Mechanization of farming will increase in all developing countries. However, the degree and pace of this mechanization will depend on the wisdom and policy of the governments concerned. (306, p. II-20) When employment is a consideration, mechanization should be selective and should begin with improvements of traditional labor and animal-powered activities where possible. In some cases more advanced mechanization may have to be promoted for particular crops or areas. Intermediate forms of technology, e.g., pedal threshers, will be highly beneficial in many cases. The particular type and degree of mechanization for a specific set of farm conditions can only be determined by careful regional, farm and crop need research and analysis. (307, p. 41)

Perhaps the biggest obstacle to such careful work is the prejudice that mechanization means large-scale farms and equipment, and that only mechanization is modern and therefore desirable, e.g., as some seem to believe in Sri Lanka. Events in Japan, Taiwan and, on a smaller scale elsewhere, have shown this prejudice to be wrong. (47, p. 105) The true essence of modern technology is more chemical and biological than mechanical. The new technology is chemical fertilizers, pesticides and new disease-resistant and high yielding varieties. (320, p. 68)

If mechanization is to complement rather than displace labor in agricultural production, then present policies which subsidize the use of capital should be eliminated so that prices will more closely reflect actual costs in the society. (312, pp. 29-30) Not only must direct contributions to capital costs, e.g., subsidies, artificially low interest rates and low fuel prices, be reduced or eliminated but indirect contributions like over-valued exchange rates must also be removed or adjusted. Where, for whatever reason, a subsidy measure cannot be corrected, e.g., changing an over-valued exchange rate may be politically impossible, it will be necessary to take counter-balancing measures, e.g., impose

a tariff on the particular types of equipment. Policy changes of this type will conserve scarce capital, foreign exchange and fuel as well as preserve and provide employment. (205, p. 58)

When mechanization is going to be permitted or encouraged, it is necessary to take great care in selecting the type of permissible mechanization. Pumps for irrigation will almost always be employment as well as output-increasing. (212, p. 105) Commercial crops, high yielding varieties and multiple cropping are all dependent, in many environments, on increased water supply and control. In most other cases, only a careful analysis of the local situation will determine where mechanization is employment increasing.

Finally, it has to be recognized that in some places, none of these measures will solve the unemployment problem or significantly help equalize income. In Latin America especially, the only effective way of providing full employment may well be land redistribution. This may be the only way to get a sufficient degree of labor use in agricultural and small scale industrial technology. (316, p IV-16) Small scale farming is the most labor using method of agricultural organization. (321, p. 104)

F. Land Reform

There has been a lot of debate over whether land reform increases or decreases output. Both sides offer cases in their favor. In Iraq a poorly managed, some would say disastrous, land reform resulted in declines in food grain output of perhaps as much as sixty percent. (322, pp. 291-292) In Egypt, however, output of both food and cash crops increased after the land reform. Sugar yields rose 20 to 30 percent in the ten years following the reform even though there was only a small increase in the use of fertilizer and irrigation. (322, pp. 285-286) Land reform in Japan was even more successful. Output continued to grow after the reform in 1946 in spite of a decline in acreage and the number of farmers. Farm income doubled between 1950 and 1963. (322, pp. 287-288)

Thus rather than attempting to draw a general conclusion about whether land reform will increase or decrease output, it is necessary to see when increases or decreases occur and then to identify what needs to be done to insure increases.

But increases in output are not the only changes that a government may want to bring about by a land reform. Governments often want to develop political support, reduce rural unrest, reorganize production organization (e.g., form cooperatives, corporate farms or collectives). Implicit in these and underlying them all is the need to improve the lot of the rural poor. Thus in looking for a way to maintain and increase agricultural output, these other objectives need to be kept in mind. In many cases they will be the primary objective.

1. Conventional Land Reform

Although land reform may disrupt production, so may a lack of land reform. In Peru, land invasions led large landowners to expect a land reform; they transferred their assets out of agriculture and decapitalized their estates; production declined.1/ (323, pp. vii - viii) The threat or expectation of land reform also seems to have reduced agricultural productivity and investment in Mexico in the thirties. (321, p. 111) If land tenure reform is a major political issue that threatens landlords, output may decline and disinvestment occur regardless of whether the reform takes place.

If marketing is disrupted, the immediate effect of a reform may be to reduce output. This seems to have happened in Bolivia. Declines in output were partially due to spontaneous land redistribution, the result of often violent takeovers. However, the marketing system run by the landlords also collapsed and no system to replace it was provided. Several years passed before new marketing channels grew up. (324, p. 166) In China there was a serious decline in output during the Great Leap Forward when traditional market systems were abolished in favor of communes.2/

What appears to be a drop in output may often be a drop in marketed output. New owners keep a larger share of the output for their own use and this may reduce supplies to markets. This was a factor in the apparent drop in output after the Bolivian reform; increased output soon restored market supply in spite of this increased consumption. (325, pp. 317, 319; 321, p. 111) Increased rural consumption of grain after the reform of 1952 created food shortages in Chinese cities; this led the Chinese to start a system of compulsory food procurement and rationing. (327, p. 24; 328, pp. 21-22) In countries where farmers have suffered from food scarcity and marketed output is sold primarily by landlords -- the situation in pre-reform Bolivia and China -- farmers can be expected to consume a share of what previously went to landlords; market output will drop until output increases.

Market disruptions are not, however, the biggest problem. In Peru, land reform worked smoothly with little loss of production followed by increases in production and employment where

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1/ Uncertainty also led small and medium landowners to withhold investment during the Peruvian Reform; the Government issued certificates guaranteeing title to the land to many of these farmers to try to restore confidence and thus investment. (326, p. 49)

2/ Later, communes were reduced in size to conform more closely to traditional market areas.

farm units were not reorganized, i.e., on large scale sugar and livestock estates. These estates were turned over to wage workers who continued to work them as large units. However, on the crop estates where farmers had been individually operating tenant farms, the government tried to organize large, cooperative farms. Output and employment both fell; sixty percent of the farmers were dissatisfied with the reform methods and would have liked to receive individual plots. In none of the wage labor (sugar) or livestock estates did members prefer subdivision of the estate. (323, pp. 113-114) Disruption and declines in output occurred where both the ownership of the land and the organization of production were changed. Where only ownership was changed, output remained stable or increased.1/

Similar results were obtained in Costa Rica and Honduras. In Costa Rica, the Bataan Project tried to preserve the infrastructure of a former United Fruit Company plantation by forming a production cooperative; the reform beneficiaries were to work for the cooperative as salaried workers. These beneficiaries had previously been small holding campesinos rather than plantation workers. The result was failure. The Project tried to recover, without success, by training campesino leaders in the principles and skills necessary for running cooperatives, and for community development. When this proved unsuccessful, the Project allowed each member to cultivate a small piece of land for his own use. These family enterprises on the small parcels thrived while the production cooperative sank even lower. Thus in spite of a complete infrastructure for large scale farming (irrigation, roads, housing, water supply, etc.), farmers failed to adapt to the demanded changes in production organization.

1/ The difference in results between the two cases, where production was reorganized and where it wasn't (wage labor and livestock enterprises) are so striking it is worth quoting the evaluation in full.

"In economic terms, the wage-labor enterprises and the livestock-colonato enterprises have performed much better than the crop-colonato enterprises. All nine of the wage-labor enterprises and all seven of the livestock enterprises reported profits in the year preceding my visit; four of the seven crop-colonato enterprises reported losses, nearly half the wage-labor and livestock-colonato enterprises have intensified production since the reform, and none have reduced the area seeded. Only one of the seven crop-colonato enterprises has intensified production, and three have reduced the cultivated area. Production has risen on three-fourths of the wage-labor and livestock-colonato enterprises, and in none of these has output fallen; in contrast, output has fallen in six of the seven crop-colonato enterprises. Employment has increased moderately in 55 percent of the wage-labor enterprises, and has increased significantly in over 80 percent of the livestock-colonato enterprises for which data are available. In over 80 percent of the crop-colonato enterprises employment has fallen since the reform." (323, p. 113)

About the same time (1965) in Honduras, 84 ex-United Fruit Company workers voluntarily formed a production cooperative to farm 500 hectares of land that the Company had returned to the Honduran government. They also were employed by their cooperative as salaried workers. In two years, the cooperative acquired two tractors, and a cornsheller. While waiting for $400,000 in external credit, the cooperative organized a processing plant and two packaging plants for plantain and bananas. By 1969, the two tractors increased to nine and 64 wagons. Family labor was fully utilized in the cooperative and family per capita income rose to $365.00 plus dividends. This cooperative, the Guanchias Cooperative, was so successul that four other cooperatives soon sprang up to collectively farm other large tracts. By early 1973, there were about 60 enterprises following the Guanchias Model.

Nearby, the La Subirana Cooperative had been formed in 1958 by dividing up 4000 hectares among ex-United Fruit Company workers to be farmed individually. The ex-workers rented their land and went to work in nearby enterprises, even in the cooperatives mentioned above. Ex-workers did not want to become individual farmers. (329, pp. 18-21) The important factor in the success or failure of these land reforms was whether the new reform organization was something the beneficiaries were used to and were prepared to manage. If they had the skills to technically manage a large enterprise, former workers were able to overcome managerial problems and successfully operate large enterprises. They continued to work as workers and rejected individual family farming. If they had the skills that come from small scale farming, they were unable and unwilling to manage a large enterprise and insisted on dividing the land among the reform beneficiaries.

This was also true in Mexico where workers joined together to farm cooperatively large commercial estates that had been turned over to them while farmers on remote, less commercialized estates preferred to farm individually within the framework of the ejidos. (330, p. 45; 204, p. 25) Plantations were also maintained in Puerto Rico with workers benefited by employment and profit sharing plans. (5, p. 42)

Many countries have used land reforms, as Peru did, as an opportunity to reorganize production. Often this means developing collective, communal or state farms or individualizing previously jointly operated farms. In other cases it simply means land consolidation. Sometimes such changes are a substitute for land reform rather than a part of it. Few of these attempts have been successful. Group coffee farms were tried in Kenya in the 1930's but failed. In Chile, when the Roman Catholic Church started its own land reform it tried to develop communal organizations but had to give way to the desire for individual ownership. The land reform in Iraq which produced major drops in output was mixed with both resettlement and an attempt to collectivize agriculture. (322, p. 291) Cooperative farms in Algeria generally failed due to lack of management skills and incentive problems. (331, p. 81) The state farms in Ghana ran into considerable difficulty and considerable retrenchment was necessary. (198, p. 25)

Some of the land reforms which were most disruptive because there was an attempt to forcibly change production organization as well as ownership were also the ones that were least successful at bringing about successful changes in production organization. East Europe is an example. Not only was the Soviet land reform accompanied by tremendous social disruption and loss of life but also by drastic drops in output. East European countries have returned on a large scale to the private plots that were to have been abolished and individual small farms remain a major or even the primary form of production organization in many areas in spite of earlier attempts to collectivize agriculture. (332, pp. 21-23)

The Chinese have gone the farthest with the opposite strategy of first instituting a land reform and then following up with a series of reorganizations. After their land reform, they organized work teams and worked up over a period of years to the commune organization that exists now. These changes in production organization were mostly done a bit at a time and on at least a partially voluntary basis. The biggest step, the leap to communes, was the step which failed most dramatically and which had to be cut back and revised into a series of smaller steps. During the whole process, the Chinese leadership emphasized the need for going slowly and a step at a time. (328, pp. 11-72; 68, p. 54) In spite of the radical land reform imposed on Japan, few disruptions followed. Production was not disorganized because there was little reorganization of farm units or markets. The main effect of the reform was to turn tenants into owners of existing farm units. (322, p. 287)

2. Reform of Group Tenures

In much of Sub-Saharan Africa, land tenure reform is more a matter of establishing new forms of tenure than of transferring rights within an existing system.1/ Thus, many countries encourage land enclosure and the dividing up of lands held by groups into individual family holdings or transforming and consolidating group lands into state farms. In East Africa, for instance, the British began establishing individual ownership of land as early as 1900. In Uganda, large estates, of up to sixty square miles, were granted to important political figures, partly in order to free them from dependence on their king (kabaka). Since then, many peasant cultivators bought small farms. Squatters on the estates maintained or acquired traditional rights thus softening the dichotomy between large holders and tenants. (333, pp. 66-69; 268, p. 109) More recently, the Uganda Government granted individual titles only as a demand and need for them arose, e.g., when

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1/ This is not always true. In some countries, e.g., Uganda, Ethiopia, Senegal and Dahomey, large estates of a feudal type were established. In other countries, e.g., Liberia, Ivory Coast, Kenya and Tanzania, modern plantations exist. (334, p. 108) In these cases, apply the types of considerations discussed above.

land became scarce, valuable crops were grown, widespread land sales showed that individualization of tenure was complete or increased litigation showed that customary tenures were breaking down. (333, p. 70) However, if economic growth remains more rapid on individualized land and the trend towards individual ownership continues, customary tenures will soon disappear in Uganda. (268, p. 109)

In Kenya, the establishment of individual holdings was national policy, and progressed farther than in most African countries. (268, pp. 108-109) Unlike in Uganda, however, colonial efforts were directed toward consolidation of land fragments held under traditional tenures and redistribution of land to the farmers who then became owners. This whole process was adjudicated by committees or councils of local leaders who knew the nature and interests of the farmers in the area and who could judge the equivalence of land holdings before and after redistribution. Thus, land was consolidated and registered rather than redistributed in the usual land tenure sense. Consolidation was acceptable to the farmers because they received secure title to their land. This program also raised output and income and was extended to other areas.1/ (333, pp. 70-72)

Malawi also encouraged the conversion of customary tenure rights into recorded, individual titles. This was seen as a prelude to introducing new methods of cultivation. (333, pp. 72-73) However, because the village planning committees objected, some areas registered land as family rather than individual holdings. Family holdings departed less drastically from the customary system and more closely reflected the wishes of the people in these areas. There is evidence that farmers on registered land were beginning to invest in trees and family members were returning to these registered holdings.

In addition to areas where governments have pushed tenure reforms, in many parts of Africa customary tenures are decaying spontaneously. Land registration simply recognizes legally something that has already taken place. (333, pp. 74-75) When governments have not established programs to register land, farmers are establishing individual rights to land through legal actions against other claimants, a costly procedure. The arbitrary and irregular provisions for buying and renting land that often occurred, as

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1/ However, it also created a landless class of displaced relatives, friends and tenants who had had claims to land under customary tenure. Communal grazing lands were lost to landless people. Farms have been mortgaged during food shortages and richer farmers have bought out smaller farmers. (315, pp. 38-39) Some Kenyans charge that Kenya is moving towards a system of large estates as more and more people lose land rights and are forced into wage labor. (335, p. 80)

in Nigeria, when ownership was not clearly established encouraged claimants to go to court. (333, p. 53) The introduction of cash crops and growing scarcity of land produced much litigation in Ghana and southern Nigeria. (268, p. 109)

In contrast to systems that encouraged or permitted the break up of customary tenure systems, Tanzania tried to modernize customary tenures. Ownership by the State replaced ownership by leaders and elders on behalf of the group; the President acted as owner of all land. However, the Tanzanian Government also tried to change rural production and social organization. The Government resettled farmers in hamlets and consolidated their lands. It urged farmers to adopt block cutivation and the production of cash crops. (333, pp. 77-78) The ujamaa village promotion agents went further and called for collective agricultural production by the new hamlets. However, this process ran into difficulties. Production suffered -- often because officials forced resettlement activities during crucial periods in the crop cycle when labor was in short supply. Because of slow progress, the Government dropped collectivization from the ujamaa approach. In Tabora region a tobacco project lost 25% of its growers when local officials began pushing collectiviation; only 160 acres of tobacco were planted against a target of 1800 acres. When the President and Prime Minister visited the project and assured farmers that collectivization was a long term goal and that they could keep their tobacco crops, 844 new farmers joined the project in three months.

Uganda tried to form group farms in some areas to mechanize agriculture. Unlike in Tanzania, these farms were not to change customary land tenure arrangements. Where land was previously more or less owned by a group, establishing such farms was relatively straight forward. Where land was held by individuals, problems arose. In Nigeria, a farm settlement program used new technologies and a completely new system of farm management and established a new type of land tenure. Settlers were recruited from among youth who had completed elementary school and were given as much as two years in a farm institute to learn modern farming. Although land was to be individually owned, farming was to be at least partly centrally managed. (333, pp. 78-81) Severe problems arose, however, one of which was that many settlers left the settlement and returned to their traditional homes. Several studies in Nigeria and Kenya since then have shown that the high dropout rate for this type scheme was due to the great gap between traditional ways and the methods worked out for the settlement farms. (229, pp. 72-73) In Tanzania, the "transformation" approach as embodied in the pre-ujamaa village settlement scheme, also selected and trained individual farmers to form new villages. This scheme also failed. In Zaire, the paysannat system disintegrated as the police and military force used to support it was gradually withdrawn during the upheavals of the 1960's and independence.

Some experts argue that state action is needed to modify customary systems of land tenure to make them fit the demands of increased agricultural production and modernization. (333, pp. 59-63) However, economic growth has modified traditional systems of tenure and seems likely to continue to do so. (333, p. 56) Growing population has meant that land has become more and more scarce, putting great pressure on traditional systems that treated land almost as if it were a free good, i.e., assured every member of the group a portion of land for subsistence production. (268, p. 106) The growth of cash cropping has also put pressure on customary systems of tenure. (334, pp. 108-109; 333, pp. 11, 35-36) Generally, technical change has tended to simplify customary tenure systems by reducing the number of people with claims to a particular piece of land. Particularly, tree crops and other changes which require large investments tend to bring about such simplifications quickly. (336, pp. 482-485) The growth of commercial agriculture has led to increased land sales compared to areas where traditional methods of cultivation are used. (334, pp. 102-103)

Changes in customary tenures are often hard to distinguish from the flexibility of those tenures. Thus, among the Ibo in Nigeria, the individual has broad rights to invest in the land assigned him; for instance, they can construct buildings and establish tree crops. Whether this is a change in tenure or an example of the flexibility of the tenure system is difficult to determine. (334, p. 100)

In either case, some experts argue that African customary land tenure systems have not been shown to be a barrier to individual initiative or efficient agricultural growth. (337, p. 38; 338, p. 20; 144, pp. 27-28) This perhaps overstates the point since traditional tenure systems vary widely.1/ However, traditional systems are both flexible and able to change. For example, the pledging of cocoa trees as security for loans has become fairly widespread in some areas of Nigeria even though in only one community was there a general expectation that customary courts would sanction foreclosure if the loan was not repaid. Instead, the community itself provided the major pressure for repayment when necessary. (333, p. 55)

Customary tenures provide forms of security of great value to members of these systems; drastic or forced changes will almost certainly produce confusion and resentment. (274, pp. 268-270; 333, pp. 30-31) The success of individualized holdings in East Africa may be due to long association with the British, the temperate climate of many of the highland areas where it took hold and to the feudal nature of previous systems; thus, one should not count on reproducing this success elsewhere. (333, pp. 73-74)

1/ See 338 for a description of four widely differing traditional systems in Zaire as well as a discussion of changes in these systems.

Instead, gradual and spontaneous changes should be observed and encouraged. When litigation or other disruptions indicated the need for change, registration can be introduced or extended. When major changes are introduced, they need to be based on a careful study of the traditional system and of the changes in the system that have already occurred. (333, p. 18)

Thus, experience in Africa is similar to that elsewhere. In spite of the great difference in tenure conditions in Sub-Saharan Africa, the most successful land tenure reforms are those which have separated land tenure reform from changes in production organization. Some of the steadiest and most widespread reforms of land tenure have been the result of gradual and spontaneous changes. Successful systematic reforms have often simply confirmed and registered the results of such changes or have changed tenure without radically changing production organization. Where drastic changes in production organization have been included, as in the ujamaa villages of Tanzania and the new settlements in Nigeria, difficulties have reduced the output of the new organizations and sometimes destroyed the organizations themselves.

3. Force, Land Reform and Production Reorganization

What at first seems most surprising about these results is their consistency. The same countries or projects which were most successful at raising output were also most successful at generating support and reforming production organization. Those that developed the most popular support, by giving farmers what they wanted, were also the ones that got the greatest increases in output. Conversely, where farmers were dissatisfied, output suffered and the farmers resisted, usually successfully, changes in production organization. Finally, those reforms which have separated land ownership changes from changes in organization have also generated the greatest political support for their governments. In Japan, Korea, Mexico, Bolivia, and Taiwan the post reform period was and has been characterized by peasant support for conservative governments. (339, pp. 376-377; 340, pp. 33, 35) In China, the reform has generated support for a radically different political line. The same seems to be true of North Viet Nam.1/

This is not to suggest that changes in production organization are not necessary. On the contrary, the most successful reforms are those which have been preceded and followed by the greatest

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1/ In contrast, the Huk movement in the Philippines was "most successful among tenants, farm laborers and migrant workers." See Edward J. Mitchell, The Huk Rebellion in the Philippines: An Econometric Study, ARPA Order No. 189-1. Santa Monica, California: The Rand Corporation, 1969. Cited in 342, p. 5.

organizational and technical change. Many people agree that production needs to be reorganized in Latin America. (306, pp. 11-25; 341, pp. 1-2) The difficulty is that so often the need for reorganization has been interpreted to mean that land reform and production organization should be done together. So far this has not been successful.

It is not difficult to see why some of these results occurred. Trained manpower for administering a reform is always in short supply. Thus the more complex the reform, the poorer the administration or the slower the reform is implemented. Experience shows that the slower the reform, the greater are the exclusions and resistance. Slowness and poor administration mean poor enforcement of the law. This has been especially true in Latin America. (343, p. 17) The Indian and the Philippine reforms were also slow and frequently evaded. The Philippine reform bogged down in legal arguments over yields and other issues because of the complex formulas built into the law. The quickest reforms, in Japan, Taiwan and China, were the simplest, most complete and successful. (344, p. 33; 345, pp. 17-19)

More difficult to explain is why separation of land reforms from production organization should lead to the greatest technical and organizational change. The explanation here is that land reform means a change not only of land ownership but also of who has power over others. Redistribution of land redistributes the power to make others do as one wants. (346, p. 22) To change power relations requires power. Thus the most successful and extensive land reforms have occurred where power was concentrated on the side of land reform. In Japan this was done by occupation forces. In Taiwan the reform was carried out by Armies from China. In South Korea the American Military Government redistributed Japanese owned land and the Korean government then did the same for Korean owned land. (339, pp. 385-389) The land reforms of China and North Viet Nam followed successful revolutions. In Latin America, the most successful land reforms have combined peasant revolts from below with government pressure from above as in Mexico and Bolivia. Militant peasants seized many estates prior to the official reforms in all four successful reforms in Latin America. (347, pp. 10-12; 325, p. 304) Where this type of power was not available, land reforms were limited or nonexistent. (347, pp. 16-17) Thus compulsion was usually necessary if land was to be widely redistributed.1/

1/ There are exceptions. Where agriculture is a small part of an economy, as in Chile, land reform may be instituted because owners have too little power to effectively resist. (347, p. 15)

The conditions necessary for changing production organization are quite different. People cannot be compelled to have skills they haven't learned or to trust people or techniques. These are things that have to be learned. Nor can people be compelled to suddenly drop the attitudes and habits they have learned in childhood and lived with all their lives. To try to use compulsion in these cases produces resistence rather than compliance. Thus the conditions that are necessary for land reform are destructive when applied to production reorganization. To try to mix reform and reorganization leads to confusion and attempts to compel farmers to know and believe things that they don't know and don't believe. It hasn't worked.1/

4. The Extent of Land Reform

The transfer of ownership from absentee owners to tenants is the simplest and most successful type of land reform. North Viet Nam, Iran, Ecuador, Japan, South Korea and Taiwan all relied primarily on this type of reform. (348, p. 5) Unfortunately, few places remain where land reforms can be this simple. In much of Latin America and Asia, a direct transfer of land from owners to tenants would primarily benefit the better off tenants or wage labor on estates. Day laborers and marginal farmers who live around the estate, and who may have lost land and rights to the estate in the past, would be ignored.

For instance, in India landless laborers received no land and were left worse off, at best no better off, than they were before land reform efforts. In Ecuador, a partial reform deprived the smallest landholders of communal grazing rights and the emergency help previously given by the hacienda. In Venezuela, as many people became worse off as became better off as a result of the partial land reform. (348, p. 24; 349, p. 8)

Unfortunately, the problem of marginal farmers and landless laborers is growing worse. Threats of land reform, new technologies and subsidies for labor saving equipment encourage landowners to oust tenants. In India there were 40,000 eviction suits against sharecroppers in the state of Bihar and over 80,000 in Mysore in 1969 alone. This has led to a great deal of rural unrest, violence and land seizure by peasants. (203, p. 44; 350) In Thailand, tenancy is increasing as large farmers buy out small farmers suffering from adverse economic conditions. (344, p. 35) In other areas government schemes in agriculture are only accessible to wealthy men, as in the Ankole ranching scheme in Uganda, or land is being bought up or is largely benefiting highly paid civil servants or government supported entrepreneurs as in Kenya and Ghana. (43, p. 153)

1/ How farmers learn the skills and trust they need to develop and support new organizations and to use new techniques is discussed in chapter 13.

Solving this problem makes reform much more complex. If the needs of laborers and marginal farmers are ignored, rural unrest and political alienation are aggravated rather than relieved. This happened in Chile where land reform created many new farmer-owners but created even more dissatisfied rural poor who became violent in their demand for a more extensive reform. It also happened in the former South Viet Nam where partial reforms gave land to some tenants but created considerable bitterness among landless laborers and tenants who were not given land. (351, p. 37)

This problem was partially solved during the Mexican reform. The peasants took back land they felt had been taken from them by the encroaching haciendas. This was legalized later. The peasants were moderate, however, in that they did not destroy the haciendas. Only later, under the Cardenas administration, did expropriation of large estates become widespread. (347, pp. 4, 9) Where organized peasant communities exist, a land reform can often re-establish the rights of former tenants and owners on the basis of testimony of community members.

In Peru, the government tried to maintain and where necessary to organize estates as large scale production units. Surrounding communities were included in various ways, often over the opposition of the former estate workers. (323, p. 152) Results were mixed. Usually there was antagonism and a big gap in income between the estate workers and members of the surrounding communities. In some cases, the peasant communities controlled the governing board of the joint enterprise. This produced dissatisfaction on both sides. Workers saw the estate profits taken by outsiders and their wages held down; the community members found the profits were small on a per capita basis and diverted by law into communal development projects while they were deprived of the land they wanted. (323, pp. 140-142)

The usual solution to this problem was to accept the problems involved and include the farmers in surrounding communities by dividing up the land. Often, as in Bolivia, parts of Colombia, and elsewhere land invasions by the peasants lead to this result. However, governments have been very reluctant to adopt this strategy in spite of the fact that it would seem to provide the maximum political benefits by increasing the number of reform beneficiaries. In part this may be due to general opposition to land reform as in India. But it is also due to widespread opposition specifically to the creation of small peasant holdings.

Many officials associate small peasant holdings with backwardness and poverty. They fear that small holders will lack the skills necessary to manage a farm if they are given land, e.g., as in the Philippines. (352, p. 7; 344, p. 33) They fear that small holders are resistent to change and will obstruct agricultural modernization. They fear that small farms will be nonviable -- unable to compete economically and incapable of adopting modern technologies. They fear they all these problems will result in a peasantry dependent on support and subsidy. (203, p. 37)

In practice, none of these fears have been realized. On the contrary, the most extensive reforms have produced the most modern, productive agriculture. Small holders quickly learn the skills they need to run their farms at traditional levels. In Mexico, Bolivia, Chile, Japan, Taiwan and Egypt average productivity of land rose after land reforms reduced average farm size. (341, p. 31) In Latin America there has been no significant reform where parcelization has decreased output. (342, p. 11) In fact, agricultural output has grown substantially faster in Bolivia, Mexico and Venezuela than the average for Latin America. (342, p. 7) In Egypt, the post reform peasantry has shown more initiative and managerial ability than had been expected. (353, p. 66) Cooperative management is being decentralized and farmer control increased. (353, p. 70) In practice, it is the large farms created by governments to avoid small farms that are most frequently and severely mismanaged and where output falls, e.g., in Algeria, Tunisia, and Cuba (348, pp. 21-22; 354, pp. 13-14) Even if farms are small, landless laborers are better off with a small farm than no land at all; this will remain true until reliable jobs become available. Where size is a problem, new farm owners are aware of it. In Iran this very difficulty made farmers more receptive to cooperatives which alleviated the problem. (355, p. 12)

Many Latin American countries adopted some form of asentamiento to solve these problems. This is a combination of private plots and communal lands to be farmed collectively for a period of three to five years. After this training period, the new owners are allowed to decide how much land to farm collectively and how much individually. Unfortunately, collective favoring officials and government policies often pressure the peasants to maintain collective production. Peru, Colombia and Panama have gone a step further and provide land to farmer enterprises rather than individual farmers. Other Latin American countries seem to be following the same lead. (356) Although it is too early to say such schemes won't work, the experience in Chile, Peru, elsewhere in Latin America and in Africa is not encouraging. (321, p. 60)

This is not to say that small farms are a permanent solution. On the contrary, in Japan, land laws are being altered to allow farm consolidation. Group farming is developing in Taiwan, Egypt and elsewhere. But all these changes are the result of what the people involved have found useful and necessary, not the result of government compulsion. (344, p. 31) Where compulsion has been used, as in East Europe, the private plot maintains its appeal and its higher productivity. (348, p. 4)

5. Summary

Policy makers should not think of land reform as tying down a country permanently. On the contrary, they can be sure that land tenure conditions will change as will the needs of the country. (345, p. 11) If land is distributed to small farmers, steps will

have to be taken to prevent it from being reconcentrated as is happening in Thailand, Mexico, and India. (75, p. 111; 357, p. 28) Italy and Japan placed restrictions on the resale of land to prevent this. (348, p. 6) In Italy this restriction became obsolete in a decade, in Japan in two decades. In other countries where alternative employment is scarce it will take much longer, perhaps generations, before the small farm stops filling a subsistence and employment role. (348, p. 8) In China, the need to avoid reconcentration of land was one reason for forming cooperatives. (219, pp. 43-44; 328, p. 18) Since then there have been frequent changes in agricultural organization; hardly a year goes by without them. (328, p. 11) Even cooperatives require a policy of support as is shown by the deterioration of conditions on the Mexican ejido that set in once public support was withdrawn. (97, pp. 302-304) In short, land reform cannot be a "one-shot" affair; it must be a continuing flexible process. (330, p. 47)

The success of this process, in politics, in economics and in development, depends on accepting farmers preferences as a valid, sensible starting point. Then give the farmer time and opportunity to learn new methods and the need for them. In practice this means: First, give people a type of land tenure they are satisfied with; second, then build on this as farmers learn new techniques and acquire new needs. Tenure and type of organization can then be modified gradually. Third, as a matter of strategy, separate major land ownership reforms from changes in production organization. These rules don't guarantee success. However, violating these rules in the past has led to confusion, resistence, political instability and declines in production.

G. Spread Effects, Imitation and Trickle Down

Package programs usually concentrate on medium and large farmers. One of the ideas used to justify this and to explain how benefits might be extended to small farmers is the idea of spread effects.

Programs are frequently designed in the hope that the component projects will have spread effects. That is, it is hoped that people in areas surrounding each program activity will observe what is happening and imitate it. This was a hope connected with the India package program that did not materialize. (228, p. 85) This failure is not surprising, however. The Indian package program was tried out in selected areas that showed greater potential than other areas. (227, pp. 284-285) Further, through cheap credit, inputs were slightly subsidized in these areas. (49, pp. 85-86) Special efforts were made to see that inputs were available in adequate quantities and on time. This meant other areas went without as there was not enough of many inputs, e.g., fertilizer, to go around.

In India the farmers and regions given the least help were those that needed it most and yet they were expected to imitate the farmers and regions that got help. This strategy is as likely

to be effective as putting a plank across a one meter wide ditch for one person to cross and then turning to another person facing a three meter wide ditch and saying, "Go ahead and jump. This man made it; so can you."

This fallacy of spread effects is also seen in model farmer programs where the best farmers, often larger farmers, are selected for special extension visits and training. The hope is that what they learn will be passed on or imitated by others. Again, however, this helps most those who need it least and gives no assurance that less well endowed farmers would be able to imitate even if they wanted to.1/

The emulation campaigns in China work the opposite way. It is the least endowed communities or projects, such as Da Chai and Da Ching, that are held up for imitation when they succeed. Da Chai, for instance, was a very poorly endowed community that required tremendous work and sacrifice before it was successful. Now from 3,000 to 30,000 Chinese per day visit Da Chai from other parts of China. (220)

The Chinese seem to have learned a lesson that has been missed in attempts to induce imitation or spread effects elsewhere. People with an easier task can imitate those who have succeeded with a harder task. People with a harder task rarely recognize success at an easier task as convincing or even possible for themselves. More likely they will resent the extra aid those with the easier task received or conclude that success is impossible without outside help. (228, p. 85)

This limitation on spread effects has serious consequences for agricultural policy. It explains why technological "trickle down" doesn't work. Small subsistence farmers may never imitate changes successfully tried by large, commercial farmers. Small farmers need services tailored to their particular problems. (358, p. 15) From this base there may be "trickle up" to larger farmers. (359) Thus, for instance, in the Extension chapter it is shown that the problem solving approach used with small farmers can be tried with large farmers because large farmers will select as problems technical problems. The opposite is not true. Technical extension that works for large, commercial farmers has often failed when applied to small, subsistence farmers.

1/ This does not mean that just because large farmers try something first, that small farmers won't try it. On the contrary, medium and large farmers are usually the first adopters of new technologies; smaller farmers follow. However, the gap between large and small farmers is widened, not narrowed, by special help for the large farmers. In practice such special help has discouraged small farmers from imitation.

H. Simplicity and Success

"Planning policy must take into consideration the entire range of problems simultaneously, from the level of the individual holding and the village to the national level. The success of development depends first and foremost on the extent to which policy is designed to overcome not just one obstacle, however important it may be -- as for example land reform -- but rather to deal comprehensively with the whole range of problems." (97, p. 15) Recommendations by The World Bank and other donor or advisory institutions often urge such comprehensive planning and coordination. (197, pp. 9-10) Many other experts take the same approach, maintaining that all factors must be dealt with at once or that a large number of factors, e.g., inputs, credit, marketing, storage and price systems are equally important. All these problems should be considered since individual policy changes cannot be understood unless their effects on the whole system are understood. (360, p. 36; 218, pp. 209-210; 56, p. 2; 361, pp. 55-56; 362, p. 3; 363, pp. 209, 213-214; 364, pp. 266-267; 14, pp. 551-552)

Of the many policy actions possible, many are recommended and few are unnecessary. How is the planner to decide which are important? The rule seems to be: do everything so you won't leave out anything critical. Unfortunately, the planner and policymaker don't have the time or the resources to do everything. The task the policymaker faces is deciding what will and what will not be done. This means that choices must be made and priorities established.

Taiwan achieved a fine balance between incentives for agricultural production and skimming off rural savings for investment in other sectors with a policy package including land reform, farmer organization, monopolistic supply and purchase of farm inputs and outputs, price stabilization and other policies. (365, p. 29; 248, p. 63) With a different policy package, Israel achieved both conservation of scarce water and a large positive foreign exchange balance by fostering the growth of high value crops for domestic use and for export.

Taking key measures and only key measures, e.g., the early establishment of a network of agricultural colleges and research stations, coupled with great flexibility in revising and correcting policies when experience showed them to be inadequate was the basis of early Japanese agricultural development. (366, p. 62) For example, the original agricultural cooperative law of 1900 was substantially revised by later amendments to widen the responsibilities of the cooperatives and to extend their benefits to all farmers. The price stabilization law of 1920 was constantly being amended or even replaced by new laws.

In Bengal and Bihar in India, local officials concentrated on raising output and neglected the problems that would arise when output increased. In this case this was sensible since these areas had a significant grain shortage. Government priorities in these

states reflected this concentration. In other states, e.g., the Punjab, output had increased and transportation, storage and marketing had become priority problems. (319, p. 4)

None of these countries sat down and plotted out the total policy package they ended up with. In all these countries, policy changes are still being made today. Policy planning is not a single activity completed once and for all or even complete once for each five year plan. The test of application to a local reality almost always turns up a wide range of conflicts in any policy package when the policies are formulated to apply to a wide variety of circumstances. (234, p. 26) Policymaking is a permanant process of working out and adjusting means to changing circumstances in order to achieve national objectives. (102, p. 180; 40, pp. 509-511; 97, p. 98)

When the continuous nature of policy planning is recognized, it is much easier to avoid the tendency to try to do too much at one time and instead to concentrate on a few key measures to get a definite result. (14, p. 558) Thus, for instance, in the discussion of land reform it was found that successful land reforms are those that take one step at a time and separate change of ownership of land from attempts to reorganize farms and farm methods. Where production organization was mixed with land redistribution, the result was often output declines, farmer unrest and the failure of organizational changes.

In the discussions of various aspects of rural development this theme of simplicity and relatively small, specific steps has recurred a number of times.

In marketing there is a strong tendency for governments to see a problem and then try to create a new government marketing system to replace the existing one. Experience shows that this has rarely been successful even in countries like China. Many countries which tried this have given up and restored part or all of the affected marketing channels to private or semi-private hands.

In farmer organization and extension, governments frequently tried to promote western type cooperatives or complex technologies. Often simpler forms of organization and technology were more successful, especially at introducing farmers to organization or new practices. Credit was also a field where elaborate collateral, supervision and cooperative forms were frequently tried but less successful than simpler procedures.

The JCRR in Taiwan was often criticized for its piecemeal approach of funding many little projects in many areas. In fact, many of these little projects turned out to be much bigger later after they had a chance to grow. (367, pp. 43-44) The kibbutzim in Israel have been free to start new enterprises and have used this freedom to start many highly successful businesses. It is probable that a planning ministry would never have approved many of these activities due to the small scale, lack of experience in the new businesses, etc. (322, p. 295)

The Daudzai Project in Pakistan also gives an example of this difference between excess complexity and success. Initially the Provincial Government decided that the project manager, an employee of the local government department, should coordinate all other departments at that level. This coordination would include supervision, pay, personnel review and leave-granting authority. Not only did the other departments reject this, almost killing the rural development program, but it was found that only two things were actually needed from the other departments. These were to expand their activities to a lower organizational level and to help with training. These required no authority over the departments. The departments were eager to expand their activities if they did not lose control. A training allowance was provided to insure the departments participation in training. (37, pp. 16-18)

Thus there is a recurring pattern in development policy. Experts urge comprehensive planning. Comprehensive planning calls for comprehensive new activities. These activities lead to organizations that try to introduce many new activities at once. Introducing many activities is a complex job that requires much supervision and training of others even though the agencies are new, short staffed and undertrained themselves. The result is failure that is only concealed by the financial resources of the government or an international assistance agency.

Successful cases have taken a very different direction that is more ad hoc, a problem solving approach. Policy steps are taken one at a time as particular problems arise. This is the approach that succeeded for Japan, Taiwan, China and Israel. Where programs have been introduced, the more successful ones have often been the simplest, e.g., in credit, land reform. This was not always the case, e.g., marketing schemes for high value crops have often been both complex and successful. However, even these have the simplicity of being single organizations aimed at supporting a single crop. The many problems of coordination that have plagued other package programs have been reduced by putting all elements of the package into one organization.

This does not mean that producers associations or marketing boards are the answer. It simply points out that successful schemes are those that have clearly identfied a problem and then solved that problem. In some cases the problem was a particular crop and the solution had several components, e.g., the producers associations. In other cases the problem as defined involved all farmers and many crops. In this case the solution was relatively simple, e.g., land redistribution without mixing it up with production reorganization or credit programs that simply provide credit rather than try to tie credit to production plans, the use of particular inputs or the growth of particular crops.

Thus a complex solution (a package) may work for a carefully limited problem, e.g., a single crop. Or a simple solution may work for a complex problem, e.g., the very different credit needs of farmers with widely varying scales, differing crops and different

consumption needs. What doesn't work is a complex solution for a complex problem. In practice this has proven to be unmanageable.

The problem then becomes how to simplify either the problem or the solution and when to do which. In the discussions of specific topics we have tried to set out how to succeed, and simplification is, as we saw, usually an attribute of success. In the Objectives chapter, one conclusion was that it was desirable to have as few and as clear objectives as possible. This would greatly simplify things.

Simplification is not easy. Experts and planners will be urging that all aspects of the problem be looked at at once. There will often be multiple objectives that all claim attention. There are always political demands to serve many different groups at once. Thus the policymaker faces an awesome problem in trying to deal with one problem at a time.

The key to success in these circumstances is to realize, and to help others realize, that concentration on one problem does not mean neglect of others. On the contrary, the very act of seeking simple solutions often releases resources for other activities. For example, a government that attempts to take over the grain trade is creating a tremendous administrative burden that will draw scarce manpower from other activities. If, however, the government simply tries to cure the defects of the existing marketing system, e.g., by passing a marketing law and providing cooperatives or other groups with standard weights and measures, the costs in manpower may be minor. In fact, outsiders -- in this example, cooperatives -- may be enlisted to assist in carrying out the improvement.

1. Simplifying Policy Decisions

Since big programs frequently fail and little programs that are built up have been the basis of success in some of the most successful countries and projects, it is worthwhile considering how the very complex problems with many interactions that face planners can be broken down into meaningful components. A number of ways of making big decisions or programs smaller or simpler have been found to work in various situtations.

a. Pilot Projects

Perhaps the best example of the use of pilot projects to simplify decision making was the approach used by the JCRR in Taiwan. One of the criteria the JCRR used in its funding of projects was that any project or activity be demonstrated to be feasible before broad expansion was tried. (368, p. 3) Thus a field rat control campaign began with experiments and then a field test in 1953-54 on 1,000 hectares of sugar plantation. By 1957-58 this program expanded to 55,000 hectares of sugar. Since farmers complained of rats in many other crops a demonstration project was

conducted in 14 townships in 1956. When this proved highly successful the campaign was carried out all over the island in the winter of 1956-57. In 1958 a permanent follow-up program was started. (368, pp. 11-12)

This illustrates not only the success of expansion from a pilot project, to widespread field tests, to a national program for some types of programs but also shows that where the technology is genuinely successful, that such a progressive approach is not time consuming. Pilot projects followed by widespread field testing tend to be time consuming mainly when there are problems with the technology or approach being tested. In this case, delays are likely to be a good thing.

A further advantage of pilot projects is that they allow testing of a number of alternatives at once. This greatly speeds up the discovery of successful methods. This, however, is true only if the cost of the projects is low so that several projects are feasible. Further, administrators must be prepared to accept that some projects will fail. Testing of several alternatives at low cost is usually practical only if project design and implementation are decentralized. (322, p. 296) This was the original idea behind the Special Rural Development Program areas in Kenya, for instance. Unfortunately the various project sponsors were not willing to go along with this and insisted on more complex projects. (231, pp. 212-213)

A major difficulty with pilot projects is that project sponsors are so eager for success that they overbuild the project. The result is a project that even if successful could not be replicated on a significant scale because of the high costs of the project. (231, pp. 212-213) World Bank projects, for instance, are usually so complex that the Bank insists on the establishment of new project authorities supported by foreign experts to run the project. This is justified by citing the weakness of project management in the country. Training of local staff to take over is usually a part of the project. Rarely are these projects expanded or duplicated by the host country. The high cost of these projects is especially regrettable because the same amount of money could fund many real pilot projects small enough so that local managers could be primarily responsible for project development and implementation.

A second difficulty with pilot projects is that in order to assure success, the pilot project is located in a particularly favorable site. This also defeats the purpose of a pilot project. Since the especially favorable conditions do not exist elsewhere, the project does not succeed as well at new locations. This can also happen by accident when a site is atypical for reasons not immediately obvious to planners.

Although the planners can try to avoid such errors, they can't guarantee an unbiased pilot project. Hence, it is important to plan not just a single pilot project but also a follow-up with a

widely distributed field test before a program is instituted nationwide. A requirement that all pilot schemes be carried through to such a widespread field test would do a great deal to reduce the tendency of project sponsors to overbuild pilot projects.

A final difficulty with pilot projects is that what works on a pilot basis may not work on a national basis. For instance, a wheat growing scheme may work well in one district and work well initially on a larger scale. The more successful the program is, however, the more wheat will be produced and prices will tend to fall. If prices fall, the conditions that made the pilot project successful may disappear. People who tried the new methods revert to their old methods. This happened with wheat in Pakistan. The pilot project may also create problems when replicated on a national scale by overloading other parts of the system. For instance, increased wheat output in the Punjab overloaded transportation and marketing channels in North India.

These difficulties mean that the pilot project, widespread field test, national program type of expansion won't solve all problems. However, it is far preferable to rushing into a national program that fails because the basic technology or approach is wrong. Hence this is one successful way to make complex policy decisions simpler.

b. Single Crop Programs

A second way of making big problems smaller and simpler is to cut out just one part of the problem, e.g., a single crop, for attention. This strategy has worked well for high value commercial crops and is usually implemented through a producers' association, marketing board or other single crop agency. The success of this approach is discussed and documented in the Extension chapter. This is an example of simplifying the problem rather than the solution since, in practice, this approach has frequently involved fairly complex organization and packages of services as well as relatively complex technical packages.

The difficulty with this approach is that it has not worked well for basic food crops such as grain. Thus there is no assurance that agricultural development using this approach will ever add up to a developed agriculture. Some crops and many farmers may be forever overlooked. This is especially true of food crops. The advantage of this approach is that it works for high value crops. Since high value crops are frequently export crops, this approach may provide considerable foreign exchange.

c. Decentralization

One of the most frequent reported failures in developing countries is the incapacity of governments to carry out what appear to be sound plans. (70, p. 271; 369, p. 154) Administrative agencies cannot or will not implement the plan. But the very

consistency with which administrative failings are reported suggests that the flaw is not just in the administraive capacity of government agencies but in the policymakers and planners who fail to recognize the limits to what agencies can do. Thus, in spite of the recognition of administrative weakness in India, even by a previous Prime Minister and a President, that government attempted to replace private wheat trading with government distribution channels. (65, p. 105; 56, p. 1) This was simply beyond the capability of the implementing agencies and this trade was returned to private hands. (370, p. A-12)

At Puebla in Mexico, the most successful and popular of several agencies providing credit was a private fertilizer distributor that was willing to grant credit to small farmers with relatively simple procedures and without security. Instead of collateral a fund was created, financed by a tax on fertilizer sold, to make up bad debts and hence to guarantee the whole credit operation. None of the banks which operate in the area was willing to offer credit on as favorable terms nor were their repayment rates as high. (271, pp. 63-70) In Kenya fertilizer retailers that received credit passed part of this credit on to buyers. Cooperatives that supplied inputs were also successful at supplying credit.

Planners and other policymakers need to realistically assess the strengths and weaknesses of all of the potential implementing organizations available, and then select policies which best use the existing organizations. Often the best organizations will be in the private sector.1/

As well as delegation to the private sector, the decision-making burden of the policymaker can also be reduced by sharing responsibility for some decisions with lower level personnel or organizations. For instance, the budgeting procedure that was part of the Red book system used in Malaysia was very successful in simplifying decision-making. Instead of negotiating a budget with each administrative unit, local units submitted lists of projects, each with a cost figure, in their order of priority. When the State and Federal authorities decided on a budget for

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1/ The presumption that government agricultural projects are preferable to private ones seems to be widespread in the developing countries. In Africa, however, government settlements in Uganda, Nigeria, Tanzania, Sierra Leone and state farms in Ghana were all adopted with inadequate technical and economic feasibility studies, are often poorly managed and subject to political pressure, require subsidies for their mechanization and contribute to rather than solve the unemployment problem. (302, p. 30)

the year, they drew a line under the last project within the budgeted amount. The rest of the projects were scheduled in the same manner for future years. (46, p. 133) The remaining projects on the list could be revised as convenient.

There are many opportunities to decentralize decisions in developing countries. Instead of trying to develop a standardized type of housing, warehouse, clinic or school for the whole country, these decisions can be left to local communities. Generally this will lower costs rather than increase them as it permits more use of local building materials and familiar, adapted architectural styles. The Chinese have gone the farthest with this strategy by delegating to the counties much responsibility for planning and implementing industrial development. They have delegated to the communes some industrial and public works planning and implementation work as well as primary responsibility for health, education and welfare services.

d. Simplifying Programs

Simplifying programs was illustrated in the discussions of land reform and credit. A credit program that has a minimum of supervision and restrictions is simpler than one that tries to insure that the credit is used for production or tries to force a farmer to do certain things. The simple program, on the basis of experience, is more likely to be successful with small farmers than a more complex program. Land reform can be made much simpler by confining it to redistribution and providing for few exceptions. Where land reform laws have had a lot of complex provisions they have often bogged down in court procedures and various types of evasion.

In theory there is such a thing as too simple a program. There may have to be collateral requirements on loans to assure repayment by large farmers or even some small farmers. But many of these necessary complications can be discovered in pilot projects or from operating experience. In practice, programs rarely fail because they are too simple. This may simply mean that errors of simplicity are quickly corrected. Unfortunately, the corrections often add up to a complex bog of bureaucratic red tape that proves fatal to the program.

e. Priorities

None of the above recommendations is to suggest that complexity is necessarily a bad thing. On the contrary, development tends to be a process of increasing complexity. Complexity, however, is difficult to administer and good administrators are scarce in most countries. Hence it pays to avoid complexity if simplicity works. Further, where complexity is unavoidable, it is best to move into it a step at a time so experience and competence can be developed.

Once activities have been reduced to the smallest, simplest elements possible, the policymaker still has the problem of choosing which of these elements to include in current policy. Generally policymakers think of such decisions as ones of choice between alternatives. This, however, makes the decision harder because the things that are not included are important. Thus to exclude them runs the risk of failure or of political problems. In attempting to avoid this problem, many policymakers end up adopting a little of everything.

There is another way of looking at these decisions that may make the solution easier. This is to recognize that over time a country can afford to do many things it can't afford to do in one year. Thus the budget may only allow three new programs to be introduced in one year but seven new programs over a five year plan and even more over the next 20 years.

Thus the decision the policymaker faces is not just which gets included and which gets cut but which comes first and which comes later. Often this is a much easier decision to make since the political opposition is reduced and because there may be objective reasons why some steps belong naturally before others. For instance, the Chinese rural development strategy relied heavily on rural and agricultural public works. This made cement a natural first rural industry as cement played a big role in public works and the relatively low quality cement was adequate for this purpose. But public works improved water control -- irrigation, drainage and flood prevention. Improved water control and use increased the returns to fertilizer. Hence, fertilizer was the second small scale industry developed in Chinese rural development. Increased water control and fertilizer use greatly expanded yields and permitted multi-cropping. This meant there was a big increase in labor demand at harvest time. Larger crops had to be harvested and the land quickly prepared for the next crop. The third small scale rural industry was labor saving agricultural machinery. Thus the natural sequence was to develop cement, then fertilizer, then farm machinery. (220) Other countries may find other sequences more appropriate. The important point is that it is a choice of which comes first not which gets left out.

The question then is, how far must one step go before another can be taken? In the above Chinese example, all three industries developed together even though they were introduced in a particular sequence. This worked in this case because there was considerable local autonomy in making decisions about small scale industry. Each commune could start with what it needed most. Working on one step does not prevent more work on an earlier step at a later date. In this case the answer to the question when to start the next step is when it is needed and resources are available. This becomes primarily an economic question best solved by analysis of alternative costs and benefits.

Not all decisions are of this type, however. Land reform is an activity that stops when emphasis decreases. For this reason, and because mixing land reform with other changes has not generally been successful, it is best to complete this step before going on to another. Failure to complete this step, once started, means progress is likely to stop.

Similarly, marketing improvements may make markets available to more farmers but not to all. (61, p. 72) If the reforms improving markets stop, then all further measures on behalf of the excluded farmers are likely to be failures. Thus, although other measures can begin before this type of reform is complete, this reform must be carried on until complete if all farmers are to be reached by later measures.

2. Where Simplification Is More Difficult

Simplification of the above types will not work in all cases. There are some policy instruments that cannot effectively be divided up. Usually it is not practical to introduce price supports for a crop in some areas but not others. The reason is that as long as there is relatively high mobility between areas, such a limited application would lead to smuggling and other distortions. Tariff policies must be uniform for the same reason. Marketing reform must usually be country-wide for the same types of reasons. Also, different weight or grading systems in a country would complicate trade. Tax policies should be uniform for the same types of reasons but in practice they are not. This is especially true where states and cities have independent taxing authority. Regulatory policies must usually be uniformly applied also. Finally, land reform policies are usually applied uniformly for political reasons, i.e., it is difficult to justify expropriating some farms and not others of the same size and quality of land. However, where land tenure conditions vary widely, there have been local adjustments in policy as in Ethiopia. India's land policy has varied from state to state because it is a state issue under the Indian federal system. In many countries land reform has varied widely in practice even though the laws have been uniform (e.g., Colombia and Bolivia). This is because of differences in implementation, e.g., degree of peasant unrest and organization, violent takeovers, degree of landowner resistance and organization, education of land reform beneficiaries and when reform reaches an area.

Furthermore, it may be impossible to successfully try these policies out for a short time. This is obvious with land reform. With price policy, marketing reforms, tax measures it may take several years before farmers come to fully trust the new policy and to adjust to the new situation the changed policy creates. The policymaker is left with no choice but to make a big decision.

There are, however, two assisting factors in this situation. First, to the extent that the policymaker has simplified where he could in other ways, he has a much smaller number of these big

decisions to make. Second, to the extent that the situation has been simplified, there are fewer complications in analyzing the probable effects of the new policy.

In the end, however, the policymaker has no choice but to try to determine what will happen before he tries a new policy. Since he cannot know this for sure, the best he can do is gather information from as many sources as possible. The key sources in these situations will usually include:

(a) Technicians and professional staff. These people can help by providing information on what should happen, e.g., economists can tell you what should happen as a result of a particular change in price policy.

(b) Experienced professionals and managers in the implementing organizations. In successful countries considerable policymaking power is delegated to or shared with the organizations that will carry out the plan including non-government organizations. In Israel, for instance, economic policy was set by the entire government, including Production and Marketing Boards. (40, p. 510) In Taiwan, eight working groups collaborated closely with a system of planning committees at each administrative level down to the village to develop agricultural plans. Production figures were adjusted up and down through this system of committees. This was done to assure that planned output fitted production potential. (367, p. 36) In China also higher level plans were checked with lower level organizations and adjustments were made. (219, p. 78) This is as it should be as otherwise an organization, region or community may be given policy assignments it cannot carry out. (56, p. 6) Policy planning without close and continuous interaction with implementing agencies ends up producing guidelines or recommendations which are not accepted by the organizations concerned because the policies are unrealistic. (144, p. 105) Such policies go unimplemented. (371, Appendix A, p. 4)

Thus, although theory can tell you what should happen, it is the people who have had to do it before that will know the most about what actually happens in similar or related situations in a particular country. Understanding what is likely to happen and why and what can be done about it are all matters that need to be studied with those who have done it before.

(c) Since no country can try everything, there will be many policy alternatives which have not been tried before in a particular situation. Even experience with rough parallels with a suggested line of policy may be lacking. In this case the closest experience to the situation in one developing country will be the experience of other developing countries. Thus when faced with a new situation, the policymaker will find it useful to look at what other countries have done in similar situations and what the results were. Although the relevance of others' experience may not always be obvious -- that is the justification for this Reference Book -- any experience is better than none when making decisions that the policymaker and his country may have to live with for many years.

X. FINANCING AGRICULTURAL PLANS

One test of a plan is whether adequate financial resources are available for its implementation. If not, the plan becomes no more than a political promise. The development of agriculture requires both fixed and working capital. Fixed capital is needed for such investments as irrigation works, agricultural machinery and rural infrastructure, while working capital is required for current inputs like seeds, fertilizer and pesticides. The provision of adequate working capital is as important as that of fixed capital if the full benefits of agricultural investments are to be reaped.

A. Sources of Financing

In the developing world, non-monetized subsistence agriculture is widespread. It is characterized by a predominance of tenant farmers with fragmented lands who can rarely save much or build up adequate security. Under these conditions, the financing of agricultural plans depends to a large extent on public funds. It is estimated that public investment amounts, on the average, to about 70 percent of the total agricultural investment in the developing countries, which indicates the need for a corresponding mobilization of agricultural savings in the public sector. The need for such a mobilization is partly reduced if foreign public and private investment is available, but so far foreign finance has not provided a substantial part of agricultural finance in many developing countries. (372, p. 17)

1. Local Sources of Financing - Public

The fixed capital needed for agricultural development is generally provided by the government. The government provides such infrastructure as water and power for mechanization, irrigation, transport and communication to aid the marketing and distribution of non-farm inputs and farm outputs, research on new and improved products, varieties, breeds and techniques, and extension service and education in rural areas to advance the adoption of new and improved techniques of production. However, in order to persuade the farmers to adopt the new techniques, the government must either leave enough resources in their hands to meet the needs for working capital or provide sources of credit to the farmers to finance such needs. (373, p. 961)

The major revenue-producing taxes on agriculture in developing countries are land revenue, agricultural income tax, personal taxes and export duties. Land taxes yield relatively little revenue in most developing countries today. It is sometimes argued that land

tax per se has an output-increasing effect. Although this has been true for Japan, a substantial increase in agricultural output was obtained there not only because of the heavy tax on agricultural land, but also due to the infusion of fertilizer, education and other improved inputs at relatively low cost into the agricultural sector.

If land arrangements are such that large holdings are inefficiently used, while there is surplus labor available on small holdings, a land tax based on or related to potential output would force owners of large holdings to use their land more productively in order to meet taxes. Such results have been obtained by an intelligent use of such taxes in some Latin American countries. If the land tax is progressive, that is, if the rate per acre increases with the size of holdings and/or the value of land per acre, there is increased pressure on large landowners to sell part of their holdings or to improve land utilization. A progressive land tax could also be assessed on potential output which would discourage absentee landlordism and speculative holdings of idle lands and promote sale of such lands to small farmers who could use the land more intensively. (373, p. 463) This has been the case in Brazil, Panama, India and Taiwan, where higher taxation of uncultivated or undercultivated land has been used to assure better land utilization.

In China, the taxation of land is based on normal yield; any additional output due to good management or weather conditions is exempted on order to offer incentives to increase production. (5, pp. 43-49) The existence of a land tax to be paid in cash is also important as a way of increasing the marketed surplus of agricultural products. Farmers must grow and sell more to supply their increased cash needs. (373, p. 466)

The importance of land revenue has declined in relation to the total tax revenue in most developing countries, e.g., in India, Pakistan, Brazil and Ethiopia. The prevailing systems are generally inequitable as the tax falls on all lands equally without any exemption. The yields from such taxes are fairly inflexible as the tax is a fixed one and does not grow in proportion to agricultural income. In addition, the unwillingness of farmers to pay tax to a distant government with which they have little contact compounds the problem of collection. The way out of this is not to abolish land tax, as has been done in India, but to make it progressive according to the acreage, value, or presumed output of land. This will have the effect of making the farmers use land more productively and also has led in some cases to land sales to small farmers. Another important step has been to decentralize both the authority to tax and to deliver services. Arthur Lewis has noted the importance of local authorities providing services to farmers: when the farmers can see what they are getting for their money they are more willing to give voluntary labor, as well as to pay more taxes to meet their needs. By contrast, taxes going for some unseen and unknown end have been vigorously resisted. (373, pp. 493-495)

In the developing countries, it has been difficult to get sufficient revenue from agricultural income tax due to poor record keeping and difficulties in assessing taxable capacity when income is mostly in kind. Of course, if most of the income is being generated from large farms, then in theory it may be possible to generate most of the agricultural savings by taxing a relatively small number of large farmers. This would not apply in countries where a vast amount of land is in smallholdings. In India, for example, 50 percent of total land holdings belong to farmers with holdings under five acres.

The critical elements in establishing a successful agricultural income tax system are: (a) the administrative feasibility of reaching a very large number of farmers with low income, and (b) the sufficiency of means of determining the level and rate of change of this income over time. Difficulties with these elements largely explain why very few developing countries have, until the present, taxed their agricultural sector directly through the income tax mechanism.

Personal taxes seem to be more suited to most countries with traditional agriculture. They involve family-by-family assessment of income and income earning assets, made by local officials or community leaders, to determine what is approximately a fair tax for each family. Such taxes would be most effective when tied to local expenditures where benefits are obvious to local taxpayers. By keeping the assessment procedure simple, it is possible to make the personal tax an improved substitute for poll tax as it can be related to crude measures of ability to pay, thus increasing its revenue potential. (373, p. 467)

One direct means of taxing agriculture is through betterment levies. Agricultural land often appreciates in value because of irrigation works or opening up of new roads or other infrastructures by the state. It is legitimate that some of this gain should be recaptured by the government since the gain has occurred because of actions unrelated to farmers' own efforts. Betterment levies are often a tax on capital gains, as in India and Pakistan in the case of major irrigation works. Another means of capturing such gains is a road tax on landowners, as was used in Ethiopia. Sometimes such a tax is attached to the agricultural income tax so that payments are proportional to agricultural output and hence to road usage.

Historically, the main source of revenue from agriculture in the developing countries has been taxation of foreign trade, e.g., import and export duties. The chief attraction of these duties is that they are relatively easy to administer. But the combined affect of export taxes on agricultural output and import duties on agricultural inputs can seriously affect the incentives for domestic as well as export production. Great care must be exercised in devising these duties to ensure that they do not create adverse incentives for agricultural production by turning the terms of trade

seriously against agriculture. The main purpose of these duties should be to capture windfall gains which arise due to sudden shifts in international prices. For this to happen, they must be adjusted quickly and flexibly in response to the changing international situation.

For commercial agriculture, one successful approach has been to place farm exports on a sliding scale which becomes applicable only when export prices rise above a predetermined level. In Pakistan in the late 1950's, this was one of the steps that the government took to encourage agricultural production. The reduction of export duty on cotton and jute had a direct impact on raising the absolute and relative prices of cotton against wheat, and jute against rice, and this policy contributed to the rather spectacular growth in cotton and jute production, increasing foreign exchange earnings. (244, p. 53) In India, it has been suggested that a sales tax on agricultural produce at the point of sale could be a good indirect tax on agriculture which would fall only on landholders who have enough surplus to sell. (374)

For fiscal authorities, the need is to formulate and effectively execute a system of taxation which has built-in incentives and disincentives -- incentives to those who would take advantage of the resources available to them and disincentives to those who would refuse to exploit these resources. The tax system in agriculture should be used as a means to ensure that a significant part of increased income in agriculture is reinvested rather than wasted on ostentatious consumption. At the same time, the government should insure that adequate and judicious subsidies are provided on major agricultural inputs like fertilizer, pesticides, improved seeds and irrigation water to compensate for foreign exchange restrictions, tariffs or other fiscal devices raising the costs of these inputs. India, Pakistan, Japan and Mexico and many other countries provided fertilizer at lower than world prices. But these subsidy programs seem to have benefitted large farmers more than small farmers in most countries. In order for the government to help those farmers who need subsidies most, it may be worthwhile putting subsidies on a selective basis benefitting only certain groups of small farmers or certain disadvantaged regions.

2. Decentralization of Fiscal Authority

Farmers have critical needs for more effective public services, which in theory could be provided through increased taxes. The historical reality in most developing countries, however, is that farmers have had little or no voice in what has been done with taxes they have paid. In most cases, farmers have paid taxes to support nonfarming classes, with the poorer farmers having to shoulder the heaviest tax burdens. It is not surprising that farmers are loath to pay taxes to some distant government whom they may in fact have little reason to expect returns from. One means suggested for dealing with this problem is to decentralize taxing authority to mobilize and use local resources more effectively. Those who support this approach argue that regional and local governments can

be made responsible for collecting direct taxes on land and personal taxes. In practice, however, little has been done in this area.

At present the proportion of expenditure on rural development which is allocated as a result of local decisions is estimated to be fairly small -- in the range of 10 to 20 percent. Budget authority continues to rest with the central authority in most countries, with a major part of the funds allocated on a departmental basis. Funds which provincial authorities can allocate out of their own resources are generally inadequate. Even where there is a considerable degree of local autonomy in spending, reliance on central governments for funds is very great. Central governments usually curtail attempts by local powers to raise additional revenue directly from local sources, although such local resource mobilization can not only supplement central government allocations, but also strengthen the basis for local participation in planning and implementation and increased fiscal responsibility at the local level.

The extent to which resources are raised at the local level depends, in part, on the extent to which those contributing to the cost directly benefit from the programs. The response of the local community to accepting taxation and making local projects work may be quite favorable if they are the major beneficiaries of such projects. If economic power in an area is concentrated, however, as in some states in India, the rural elite may be unwilling to pay the financial cost of public works unless forced to do so.

From the point of view of developing responsible and sound central/regional fiscal relationships, the following criteria should be taken into account:

(1) The regions should be allowed to exploit fully their own resources to cover their routine expenditures as well as some additional taxation powers to help finance some development expenditures.

(2) Natural resources such as oil, natural gas and minerals should be regarded as national assets. Taxes and royalties earned on such assets should be put into a national "development pool" for redistribution.

(3) The central government should give regions a development grant based on one or more of the following factors: population, growth potential, backwardness, and local development effort.

The above three criteria for defining a responsible and workable central/regional fiscal relationship have been worked out in Indonesia. If due recognition is given to the special characteristics of different countries and governments, they can be adapted to other countries as well. The important thing is to fully mobilize the development resources of the country with a minimum of confusion or central/regional/local rivalry.

B. Local Sources of Financing - Private

1. Moneylenders and Intermediaries

Private sources of finance for agriculture come from both informal and formal capital markets and from household savings. The informal source is made up of a non-commercial sector and a commercial sector. The non-commercial sector is represented by loans from friends and relatives who often charge no interest, and the commercial sector is represented by loans from crop buyers, input dealers, landlords and professional moneylenders. It is this source that probably serves about 95 percent of small farmer credit needs in most developing countries. (375, p. 226) The village moneylenders, who are by far the most important source of credit to small farmers, are well-known for their operational knowledge and flexibility though they often became a class of exploiters, using the weakness of the borrowers to their advantage. But since the source of credit is nearby, and readily accessible, quick adjustment can be made to changing situations, and generally the size of the loan is determined by the farmer himself. For these reasons farmers continue to borrow from the local moneylenders although the moneylenders charge usurious rates, and in many places, institutional credit has made no significant inroads into the activities of local moneylenders. (248, p. 63)

Apart from moneylenders, on occasions private input dealers have been an important source of credit. Given proper incentives, such as liberal imports of certain essential agricultural inputs, they have been quick to respond. In Mexico most of the credit to finance the ambitious maize program came from private fertilizer dealers.

2. Private Commercial Banks

Private commercial banks can be a good source of agricultural credit and have provided credit for large commercial farms in Latin America. But almost no use is made of them by small farmers in tropical Africa and elsewhere because there are few branches of private banks in rural areas and because banks are reluctant to lend to small farmers who do not have title to land which might otherwise be used as collateral.

There was, however, a network of rural banks of considerable importance in providing agricultural credit in the Philippines. There the majority of farmers were tenants with no collateral to offer private banks. (375, p. 11) Because of this, an Agricultural Guaranty Loan Fund was established in the Central Bank. Money from this Fund, together with insurance against losses, was lent to 179 widely separated private rural banks, which in turn relent to tenant farmers without the usual collateral requirement and at reasonable interest rates. It was largely in this manner that farm inputs for the high yielding rice varieties were financed in the Philippines. (212, p. 96)

The India-Pakistan subcontinent has a fairly well-developed network of rural banks. In India, a National Small Credit Guaranty Corporation was created to assume some of the risks of lending to farmers by insuring the banks against losses up to 75 percent of crop loans of 1000 rupees or less. With this risk insurance, commercial banks have opened millions of new farmer accounts, and in the process thay have found that small farmers are better risks than larger ones. Small farmers work hard, farm their lands intensively and pay back loans diligently. (59, pp. 54-55) In Mexico, the Government established a Guaranty and Development Fund for Agriculture in 1956 which is directed by the Bank of Mexico, which, through this Fund, is able to insure that an additional volume of resources emanating from the private sector flows into agriculture. One measure of the success of this effort is that private bank lending is now estimated to equal, or to surpass, public bank lending. (376, p. 81) It is clear, therefore, that for the private sector to be an effective source of funds for agriculture it is important for the government to be willing to assume at least part of the risks involved. Otherwise private funds will flow only to large farmers, leaving the vast majority of small farmers to the whims of traditional moneylenders and middlemen.

3. Household Savings

The assumption that rural people with low incomes and lack of economic sophistication have very little voluntary savings capacity seems to be an oversimplified one. Voluntary savings in the rural areas do exist, but financial markets are badly fragmented. Individuals often use their savings for operating expenses on the farm, for purchasing additional land or cattle, or in some countries for buying jewelry or other durable valuables as a hedge against inflation. Sometimes one can even find some form of rotating credit/savings associations operating in rural areas, e.g., in Korea, Taiwan, South Vietnam, Nigeria and in some Latin American countries. In Korea, Taiwan and (formerly) South Vietnam, informal savings in rotating credit institutions grew rapidly for several decades, and recently the savers were allowed to get attractive rates of return. (375, pp. 314-315)

Sometimes farmers are forces to save in order to become members of cooperatives or credit unions. These organizations require individuals to purchase share capital and to keep a deposit in order to be able to borrow. In a few cases, cooperatives also create forced savings by withholding part of the sales proceeds from a member's sales through the cooperative. In Kenya, a few cooperatives deposited proceeds of members' sales through the cooperative in regular savings accounts. In spite of the modest rates of interest paid to the farmers, cooperative officials were pleasantly surprised by the amount of deposits which were not withdrawn. In Bangladesh, directors of the Comilla program required individuals to make minimal periodic savings deposits in order to remain eligible for other developmental activities. Again, despite a very low rate of interest, large amounts of funds were deposited in the program over the years. (375, pp. 314-315)

These are but only a few examples of successful experiments in a limited number of countries. There are few countries where rural savings have been vigorously promoted and strong incentives given to farmers to defer consumption in favor of savings. Only Japan, Korea, Taiwan and (formerly) South Vietnam emphasized mobilizing rural savings, and they experienced a tremendous growth in savings through a network of rural banks and aggressive incentive systems. (375, p. 116)

In most developing countries, what is really lacking is not the savings capacity, but the institutional structure to mobilize savings. One of the first prerequisites for a successful drive to generate sufficient funds for agricultural development, therefore, is to establish the right kind of financial institutions. (This is discussed further in Section D.)

C. Sources of Financing - Foreign

The shortfall in the domestic mobilization of savings -- both public and private -- can be partly met by foreign aid and investment, but so far external finance has rarely provided substantial investment funds for agriculture. Apart from large scale irrigation and infrastructure projects, fertilizer inputs, mechanization programs and technical aid for research and extension, measures to increase agricultural output and implement rural development programs make only a small demand on foreign exchange. Foreign financing sources can play an important role in other agricultural development activities only if they are prepared to finance local as well as foreign exchange costs.

The sources of external finance to developing countries, whether for agricultural or industrial development, are bilateral foreign aid and loans, loans from multilateral agencies, including the World Bank, regional development banks, and the United Nations Development Program; and loans and grants from foreign private investors and some private foundations.

The most important of these sources is net disbursement of official development assistance by the Development Assistance Committee (DAC) member countries.1/ These funds are made available by governments as grants or as loans on concessional terms, primarily for developmental purposes. Though the overall figures are rather impressive, the assistance for agricultural projects has been rather limited. Direct bilateral assistance for agriculture from the sixteen DAC aid donors has been less than US $300 million

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1/ These are Australia, Austria, Belgium, Canada, Denmark, France, Germany, Italy, Japan, Norway, Netherlands, Portugal, Sweden, Switzerland, the U.K. and the U.S.A.

a year. The flow of external assistance, both bilateral and multilateral, for agricultural development in developing countries runs about US $1.5 billion per year, excluding assistance from socialist countries. (377, p. 131) Over 60 percent of such assistance comes from the World Bank. The World Bank is now the largest single external source of funds for direct investment in agriculture in developing countries.

In the early years of the World Bank's operations, the emphasis was on non-agricultural development so that, between 1948 and 1960, only 17 percent of total Bank projects and 6 percent of total Bank investment was for agriculture. In the following years, as a result of the World Bank's belated appreciation of the role of agriculture in the developing world, there was an increase in the Bank's share of lending for agriculture. This share increased further following the creation of the International Development Association (IDA), a part of the World Bank which provides low-interest loans for up to 50 years. This resulted in an increase in lending to the poorest countries, many of which were heavily dependent on agriculture. As a result, the Bank Group's lending for agriculture rose from 12 percent of all lending in 1961-65 to 24 percent in 1973-74.

The World Bank's overall policy towards agricultural development also changed over the years. In the initial years, the emphasis was on the transfer of foreign capital and technology and the financing of fairly capital-intensive projects, particularly in irrigation. In fact, between 1961 and 1965, 79 percent of World Bank investment was in irrigation. The Bank continued to invest heavily in irrigation projects, but the growing appreciation that agricultural development involves a whole complex of interdependent components, led to a substantial change in the patterns of lending for agriculture, including investments to insure that irrigation water was used effectively at the farm level. By the mid-1960's, the Bank was financing a wider range of activities -- agricultural and livestock credit, storage, marketing, processing, fisheries and forestry development. Emphasis was given to the promotion of technological change at the farm level through the financing of programs to enable farmers to acquire improved seed, fertilizers and equipment. The World Bank also supported agricultural research projects both in individual countries and in international research institutions.

In recent years, the World Bank Group supported both financially and with technical expertise innovative rural development programs in various countries. For example, IDA credit to Upper Volta for agricultural development created a Rural Development Fund. Its purpose was to deal with the uncertainties of government finance, particularly after the termination of the project implementation period, and to mobilize additional local resources. The Bank Group also helped finance the Korea Seeds Project which involved the establishment of a modern seed industry in Korea and continuing research in a range of crops. The Keratong Land Settlement project in Malaysia, which includes project towns in the settlement area, is another Bank-financed project.

The Bank also supports ongoing programs for rural development in selected countries where there is sufficient commitment on the part of local leadership. Examples of these projects are the Mauritius Rural Development Project which supports the rural works program there; the Mexican Government's PIDER program of rural development; and provision of training facilities to local officials in the formulation and implementation of the INPRES program of rural works in Indonesia.

The contribution of regional development banks for financing agricultural development is much more limited that that of the World Bank. For example, of the total development loans authorized by the Inter-American Development Bank (IDB) to Latin American countries in the 12 years between 1960-72, agriculture received only about 14 percent of total IDB loans. But in 1973, the IDB substantially increased its support for agriculture to 23 percent of its total lending. Most of these loans went to finance irrigation, farm mechanization, agriculture and livestock credit and land settlement projects. (378) The Asian Development Bank's (ADB) contribution to agricultural development for the region was only 13.1 percent of the total authorized by the ADB during the period 1968-1972. However, agriculture accounted for 40 percent of the ADB's concessional financial activities, mostly in the less developed member countries. (379) The African Development Bank, on the other hand, though contributing only 11 percent of its total loans to agriculture during the period 1960-70, increased its lending to agriculture substantially in the following years, and in 1973, 24 percent of the African Bank loans went for agricultural development. (380)

Private foreign investment in agricultural projects in the developing countries has been comparatively small and has affected relatively few people. Of more significance has been the assistance given by private foundations, religious institutions, and universities, particularly in the fields of research and technical assistance. But for the financial and technical involvement of the Rockefeller and Ford Foundations, the green revolution might have been considerably delayed. The International Maize and Wheat Improvement Center (CIMMYT), in Mexico, with support from the Rockefeller and Ford Foundations and also from the World Bank, Inter-American Development Bank and U.S., Canadian and Mexican Governments, produced dwarf wheat varieties which revolutionized agricultural output of this crop in the developing world. Various rural development projects, like Puebla in Mexico, the cooperative movement in El Salvador, Operation Armadillo1/ in Brazil, Instituto Colombiano de la Reforma Agraria (INCORA)2/ in Colombia are financed

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1/ A program to increase productivity of land in Brazil by sufficient use of fertilizer and lime.

2/ The agency in charge of land reform. It administers the land distribution and tries to help its clients make good use of land they till by methods of supervised credit, group farming and marketing.

by private foundations, sometimes with some help from the World Bank and foreign governments. One of the best known of the university-financed projects is the VICOS community development project in Peru undertaken by the Cornell University (discussed in chapter 11).

Although privately financed programs have been small when measured by total funds invested, area covered, or number of people reached, they have been important in other ways. Privately financed programs are usually experimental in nature, and by virtue of their size and relatively direct and flexible methods of operation, have had the freedom to explore alternative ways of getting things done in a way that is usually not possible for governmental organizations. Such private programs and projects have often served as groundbreakers in the development of new techniques, providing insights and specific methods which have subsequently been adopted by governments. This has been true in corn and rice research, development of formulated foods, and also for development of rural development project approaches, health services delivery, and family planning projects. Governmental agencies would be wise to maintain continuing contact with the efforts of private groups, as these groups have often anticipated successful measures which have utility for more widespread application.

D. Role of Financial Institutions in Financing Agricultural Development

Efficient financial institutions extending credit to farmers are a key factor for agricultural and rural development. The financial institutions which deal mostly with agriculture are specialized institutions sponsored by the government; private banks in rural areas; and group credit organizations.

1. Specialized Institutions Sponsored by Government

Governments in most developing countries have established specialized institutions such as agricultural banks, land banks, or various forms of agricultural development guaranty funds to help channel resources into the agricultural sector. For example, Pakistan's agricultural development bank has branches all over the country. India's Land Bank provides funds to credit societies to be re-loaned to farmers. Tanzania channels the long- and medium-term loans to ujamaa villages through the Tanzanian Rural Development Bank, while the National Bank of Commerce provides short-term credit to ujamaa villages prior to harvesting or selling of crops.

The main objective of the specialized institutions are: (a) to mobilize domestic savings in order to broaden the resource base of agricultural credit, (b) to assure reasonable prices for agricultual produce, (c) to assist the producers with the proper use of loans, and (d) to improve the rate of loan recovery. Some governments are also seeking to persuade commercial banks and insurance companies to invest in agricultural development projects. For

instance, the participation of scheduled banks in buying shares of the Agricultural Refinance Corporation in India has broadened the resource base for agricultural credit and has created a new climate for finance. (360, pp. 49-50)

The usual pattern of operation for a specialized institution is for the government or the central bank to loan money to an agricultural bank which in turn relends the funds either directly or through cooperatives to farmers. The farmers use the funds to purchase productive inputs like fertilizer, seed and pesticides which, combined with labor, produce more output. When the additional output is sold, the loan is repaid. The money loaned thus provides a revolving loan fund for the institution, with the institution's administrative costs covered by the interest charged to farmers.

This pattern rarely, however, works well for the rural poor. In Pakistan, about 60 percent of the total farmers could obtain only 3 percent of the institutional credit because of the small size of their holdings; in Bangladesh, few farmers hold more than 3 acres, yet these "large farmers" got more than 80 percent of the loans from the Agricultural Development Bank so that only about one-fifth of the institutional credit was available to the vast majority of small farmers having less than three acres each. In Thailand, only those farmers were fortunate enough to receive institutional credit whose holdings were about 60 percent larger than the average farm holding. In Bolivia, only 3.5 percent of institutional credit goes to campesinos, i.e., peasant farmers. Studies in Brazil, Chile, Colombia, Ethiopia, Honduras, Morocco and the Philippines all show that large farmers are the main beneficiaries of institutional credit. (375, pp. 75-80)

Public credit institutions are under various pressures which cause them to lend primarily to large farmers. Among these pressures are those to keep administrative costs down, to avoid default, and to use credit to increase production. Administrative costs rise, especially if they include loan supervision, since the number of loans increase and their average size falls. Moreover, there is widespread belief that large farmers are less likely to default and more likely to adopt new technology.1/ Large farmers have another advantage over smaller farmers in that they can offer their more valuable lands as collateral; and, of course, they can, and sometimes do, exert political pressure to get loans. (375, pp. 80-81)

1/ This is not true in India and Pakistan where rural banks have discovered that small farmers are generally better risks than larger ones. Also, small farmers have normally offered little resistance to the adoption of new "green revolution" technology as soon as they are convinced that it would lead to higher productivity. (See section on Credit in Policy Chapter.)

2. Private Rural Banks

With few exceptions, private rural banks have performed poorly in most developing countries. This is mainly because of a widely held misconception by planners in these countries that rural savings do not exist. As a result, little thought and effort has been given to having commercial banks mobilize savings and providing farmers with credits. In most developing countries most rural credit is provided by the public sector from domestic resources or through foreign assistance. These publicly sponsored credit programs have been in constant danger of decapitalization because of defaults, capital erosion because of unrealistic interest rates and very high costs of administration and supervision. (375, p. 311) The heavily subsidized interest rates on rural credit usually place a low ceiling on savings deposits too, so that the system, on the one hand, discourages the commercial banks from lending to farmers, and on the other hand, gives little inducement to farmers to save.

It is also important for the financial institutions to provide a safer place for farmers to deposit their savings and to make sure that depositing and withdrawing procedures are simple. The location of savings institutions is important for this purpose. If potential savers are forced to travel more than a few miles to deposit or withdraw funds, distance alone discourages farmers' involvement with savings institutions. (375, p. 232)

A well-chosen set of incentives for banks to seek voluntary deposits, as well as for farmers to save, has been adopted by various countries. The most important incentive is to raise interest rates on savings. In South Vietnam, banks were allowed to charge 26 percent for agricultural credit and so were able to pay savers as much as 17 percent. Private banks there reinforced the interest rate incentive with lottery prizes. Savers willing to participate in the lottery received 14 percent interest instead of 17 percent, but had one chance in three of receiving a prize during any year they participate in the lottery.1/ (375, p. 232)

Some countries, including the Philippines and Uganda, have insurance programs on savings deposits which eliminate the savers' risk of agency failure. Several countries like Brazil and Chile induce people to save by linking savings with price increases and adjusting savings upwards with price inflation. Several others, e.g., Bangladesh, Uganda, Costa Rica, have used mobile banks as a way of reaching rural savers. Savings institutions in some countries, e.g., in Bangladesh, and credit unions in Latin America,

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1/ Several other countries, including India, Iran and El Salvador, have introduced this type of lottery in connection with savings accounts.

have offered automatic life insurance on savings deposits so that, in case of the death of the depositor, the beneficiaries receive a multiple of the savings deposited. In Colombia, depositors are eligible for educational scholarships which are drawn by lottery daily from the list of savers in the agricultural credit bank. Some countries, such as Taiwan, offer tax concessions on income derived from savings deposits. (375, pp. 323-324)

Some of the best features of the traditional rural money market involving the operation of private money lenders -- including the decentralized system of dispensing credit, flexibility of repayment and personal relationships between the moneylender and the client -- if incorporated into a modern financial institution, could make it more acceptable to the farmers and more effective as a credit institution. Using this approach lending systems could be decentralized so that institutions could reach small farmers primarily through their agents who would operate at the village level with little overhead cost and paper work. To be most effective, these village-based loan agents should be given full authority to determine the creditworthiness of farmers and should be allowed to grant loans on the spot, provided they investigated each situation adequately. Agents could be rewarded on the basis of good performance, e.g., for low default rates. Even if the loan agents charge higher than ideal interest rates, their activities would compete with the monopoly position which village moneylenders often exercise. To improve their own records, loan agents would make an effort to guide farmers to adopt the right kind of technologies to improve farmers' incomes. (375, pp. 227-231) Such an approach is being tried in Pakistan, and available evidence suggests that it is successful.

3. Group Credit Organizations

The need for a group credit system arises for a number of reasons, including (i) reduction in the cost of distributing credit, (ii) greater assurance about the repayment of credits, and (iii) mobilization of new savings into the credit system. In this system, funds for productive purposes are extended to groups of farmers joined together in the form of an association, cooperative, credit union, users' society, *ejido*, or similar group. The group plays an intermediary role between the credit-granting authority and ultimate user in securing, managing and repaying loans. (375, p. 265)

Group lending, whether in the form of loose associations or formally organized cooperative credit societies, depends on the following conditions for its success:

(a) Homogeneity of the members: When the members have similar income and ownership status, they tend to distribute the loans more equally among themselves; otherwise, only better-off members may benefit from the program. For example, in India, cooperative leadership and management are reported to be mostly in

the hands of large farmers and land ownership is the most important criterion for extending credit. Even where fundamental land reforms have been introduced, as in Mexico and Egypt, credit programs have generally helped the middle level farmers rather than the poor farmers because of many other inequities prevalent in the society and because of the absence of an egalitarian framework of policies.1/ (375, p. 267)

(b) Social cohesion: Such cohesion may be produced by religious, racial, political or ideological considerations. Some of the most successful credit or multi-purpose groups have been run by those farmers who shared a certain common social heritage. For instance, the large Brazilian Cooperative, Cotia, was formed by Japanese immigrants, whose cultural homogeneity was a powerful unifying force despite the wide range of farm sizes within the membership. Reliance on tribal ties of small villages explains the success of some African attempts to organize groups, as in Uganda and Tanzania. (375, p. 268)

(c) Group responsibility and solidarity: Another important element for the success of group lending is the feeling of solidarity which is produced within a group either through political action or through outstanding leadership. This is borne out by the experience of Bangladesh, Uganda and Taiwan. In Comilla, Bangladesh, the credit cooperatives allow any farmer who deposits some savings in his local society to borrow up to five times the amount of his combined share and savings deposits, with his plot of land taken as collateral. Group solidarity is re-inforced by weekly meetings, and by the practice of extending more credit to those who attend these meetings. Also, the entire local community is held responsible for any default by any member of the group. In Uganda, credit is extended to farmers who have been active members of cooperative marketing societies for at least three years. In Taiwan, both farmers' associations and the traditional loosely organized cooperative hui are based on strong group solidarity. Farm sizes are generally similar and there are hardly any class distinctions. Both types of organization believe in the benefits of cooperation and in the system of collective responsibility for savings and loans. In contrast, credit societies in India and Ecuador have not been able to mobilize much solidarity. In India, the requirement of pledging land as collateral has favored the large farmers, and in Ecuador individualistic practices are encouraged by the prevailing local power structure. (375, pp. 268-269)

1/ The exception is Taiwan, where homogeneity of members was not a condition and non-farmers were allowed to become associate members. The system worked well because of the mutual interdependence of the two groups -- farmers who needed the credit and non-farmers who needed interest on their savings. (375, p. 267)

(d) Careful screening system: Such a system ensures low default rates and is another condition for the success of group credit organizations. The INDAP Program in Chile suffered because credit was given too easily, without establishing careful guidelines for the use of these loans. In Uganda, on the other hand, the rate of default is very low because of rigorous selection of group members. Also group credit systems function better when members are required to deposit some savings of their own as part of the working capital. This encourages them to feel responsible for the success of the group venture. (375, p. 270)

(e) A strong commitment by the central as well as local leadership is an essential prerequisite for the success of any group credit institution for the farmers. Government support, both financial and political, is needed, especially at the initial stages of the organization. Countries which have developed the strongest cooperatives like Japan, Taiwan, Korea and Egypt, all benefitted from strong government support at the beginning. As cooperative groups acquired experience and power, the governments gradually withdrew their primary role and assumed more of a supportive role. The challenge is to find the right balance between the central government's role and local leaders' responsibility. In successful group associations, such as Comilla village societies in Bangladesh and Uganda credit societies, the local leaders assumed the responsibility for securing and repayment of loans while supervision and promotional tasks were left to the upper level of organizations. (375, pp. 271-273)

There are two types of group lending organizations which have generally achieved much less success than was originally expected in many countries: (a) cooperative credit societies, (b) supervised credit.

Experience in many countries has shown that whenever cooperative credit societies were established with the single objective of disbursing agricultural credit to members at low interest rates, they met with little success. Multi-purpose societies were far more successful since they also influence planning, processing and marketing of the farmer's produce and, therefore, could become an essential part of his life. The edge that the multi-purpose cooperatives enjoy over single-purpose credit societies is amply borne out by the experience of Japan, Korea and Egypt. In these countries, most of the problems of the farmers were taken care of by multi-purpose cooperatives -- like giving them access to means of production, finance, marketing and high-productivity technology.

Supervised credit combines the granting of production credit with extension work. The loan is based on a detailed seasonal production plan, prepared by the farmers with the help of an agricultural supervisor who also visits them from time to time helping them use efficiently the supplies and equipment financed by the loan. While this form of credit has worked well in Israel, the

Comilla project in Bangladesh, in Ethiopia and in some other countries, generally it has also aroused suspicions and hostility toward undue government intervention. The secret of success, which has eluded many countries, is to strike the proper balance between when and how to help the farmers and when and how to let them help themselves.

Government-sponsored specialized institutions, private rural banks, cooperative credit societies and other institutions for group credit, these are only a few of the many possible institutional devices for delivering credit to farmers in the developing countries. An institutional form that is suited for conditions in one country, or at one point of time, may not be appropriate in another country or at another point of time. There may be some merit in simultaneous experimentation with a number of credit institutions to see which ones fit best the needs of that country.

To summarize, the financial institutions have to take note of the following considerations if they are to prove effective:

(i) They must make an effort to mobilize their own resources. As long as financial institutions consider that budgetary and semi-budgetary funds are limitless and can be obtained at negative rates of interest, they will not make any effort to raise their own resources.

(ii) Interest rates on savings and credits should be high enough to give incentives both to savers to save and to institutions to give credit.

(iii) Institutions should either increase the number of branches in rural areas or make use of branches of other institutions (e.g., private banks can use branches of cooperative credit societies) which are already there.

(iv) The institutions should try to incorporate some of the best features of the traditional money market, particularly their flexibility and operational knowledge.

XI. PROJECTS

A. Overview

1. Scarcity of Good Projects

It is widely held that most developing countries have a lack of soundly conceived and well-prepared projects, and that this holds back the process of development. International lending and assistance organizations have repeatedly deplored the lack of projects to fund. In some cases, countries have been unable to accept available funds from donors because their projects did not qualify for financing. (425, p. 58) Reviews of national development plans show that in some cases, plans have been drawn up and goals and targets set, with no indication of how the targets are to be met, that is, what programs and projects are to be the vehicles for plan implementation. Since the aim of planning is to identify and select the combination of measures best fitted to attain national objectives, planning which does not make provision for well-prepared projects is in effect not planning at all. (112, p. 5) But even in countries where projects have been identified and formulated, it is often charged that implementation is ineffective, leading to a failure to reach plan objectives.

It is the purpose of this chapter to examine why there have been too few good projects prepared and implemented, and what can be done to increase the flow of projects, based on approaches that have proven successful. A few projects and programs which are generally considered to have been successful will be repeatedly referred to so that the principles they embody may become more apparent for project planners and managers. These include the Puebla Project in Mexico; the projects undertaken in the Comilla Program in Bangladesh; the Gezira Scheme of the Sudan; and some of the project activities of the continuing Masagana 99 Program of the Philippines.1/

1/ For more complete discussions, readers are referred to: (Gezira) 450; 529; 451; (Comilla) 275; 530; 531; 494; 497; 493; (Puebla) 459; 431; 532; to 511; 460; 533; 534; 271; (Vicos) 533; (Masagana 99) 505.

Projects which have generally been regarded as unsuccessful may still have some components which were handled well. Relevant aspects of these projects can provide practices and approaches which can profitably be applied elsewhere, and some of these projects have been analyzed.

2. Types of Projects

A sequence of project types, with each kind of project serving an important function, includes experimental, pilot, demonstration, and production projects.1/ While production projects often receive the lion's share of attention, other projects perform important purposes by furthering the discovery and testing of new approaches to development, and by promoting widespread dissemination of results. Not all projects go through all phases: in some cases, large amounts of money and resources have been allocated directly to production without either an experimental or pilot project having been undertaken. This is a proper approach, in some cases, because many projects do not require substantial innovation -- except for managerial flexibility in adjusting plans to changed conditions, which cannot be completely foreseen in any event. Because a great many projects require adaptation to meet cultural, regional, and other needs, however, an understanding of the roles played by experimental, pilot, and demonstration projects can help project planners and managers to allocate resources more effectively.

a. Experimental Projects

Experimental projects have the purpose of defining problems in new ways and of assessing alternative solutions. (535, p. 13) In a specific country, they may be concentrated on finding the best means of overcoming constraints imposed by local conditions, or on transferring and adapting practices successfully applied in one country to another country where they have not yet been attempted. The development of an effective way of dealing with the rat problem in Taiwan is an example of a research effort which constituted an experimental project. A variety of possible solutions were explored and tested, with resources increasingly allocated to the most promising solutions. When the better probable solutions were identified, they were tested in pilot projects (as described below). The Taiwan rat control project is typical of experimental projects, or of projects in their experimental stage, being small in scale, with a heavy input of skilled professional staff, but normally a small investment or no investment in commodities or training. A further characteristic is wide freedom of action for research personnel and managers, which is a necessary ingredient for the development and testing of new approaches.

1/ The authors wish to acknowledge the work of Raymond Radosevich and Dennis Rondinelli, who conceptualized parts of the typology described here. See 535.

Describing the early days of the development of the Comilla Program (what he terms the idea stage) Akhter Hameed Khan says that during this time the main theoretical principles were formulated and set down. Khan believes that the setting of a project at this stage is important, and that the best headquarters for a project of this type may be in an educational institution, where the major elements are most economically located, such as researchers, equipment, and (for follow-on stages) demonstration farms and instructors. Experience shows that in general, private institutions or governmental agencies which are outside of the production and program cycle (except for periodic review and funding) have been the generators of many of the best known experimental and pilot projects. Whether or not these were educational institutions, they have had many attributes in common with educational institutions. The Comilla Program was generated from the efforts of the East Pakistan Academy for Rural Development; the Vicos Project in Peru was organized and managed by Cornell University; the Rockefeller Foundation supported efforts in Mexico have become the prototype for much of the intensive agricultural research in improved grains and foodcrops; the Agricultural Studies Centre at Borgo a Mozzano has provided support for the successful agricultural and rural development projects sponsored by Shell Oil, the PIM approach developed through the Institute for Development Studies of the University of Nairobi and other private ventures have yielded similar results. Typical of these organizations has been a freedom, and a certain distance as well, from production requirements and the pressures of frequent review during the period of early experimentation, research, and formulation of ideas. (464: 533; 531; 536)

Successful rural development projects at the experimental stage have also been characterized by intensive research into a small, well-defined geographic area (often also having the qualities of social and cultural homogeneity). These also include Comilla, Puebla, and Vicos. Research often continues through pilot and demonstration stages and sometimes into the production stage, especially when data are sparse and it is necessary to build up statistics covering a series of observations over time (statistical time-series).

b. Pilot Projects

Pilot projects build on the lessons gained from experimental projects, providing for the testing of the applicability of new methods and approaches in specific situations. Thus, the rat control procudures developed in Taiwan (described above) were field tested using a combination of the poison warfarin mixed with peanut oil and brown rice, which experiments had indicated would be effective. An initial pilot test was carried out on 1,000 hectares of sugarcane, followed by an expanded pilot test on 55,000 hectares. (368, p. 11) Pakistan's Daudzai Project is another pilot effort to determine, among other things, the efficacy of administrative service centers based on the jurisdictional area of an established unit, the police station. This is similar to the method chosen in Comilla, with adaptations to a new area as necessary. (37, p. 4)

Pilot projects allow new ideas and methods to be tested under local conditions at relatively low risk not only to managers but to politicians. If the amount of funds committed and the trial area are of modest size, even failures need not be threatening or cause lack of political status or support. By contrast, to skip the pilot stage and move directly to large-scale production increases the chance of loss if things go badly. In Kenya, the success of the smallholder tea program has been largely attributed to the original pilot test, which proved that smallholders had both the ability and the incentive to raise tea. Further, technological know-how for operating nurseries, for leaf transportation and grower supervision were sufficiently developed to carry over into full production with minimal changes. The pilot test ran for seven years and involved a relatively small number of teaholders.

By comparison, a soybean project in Central America sustained significant losses during its production phase whan peasant farmers harvested the beans by slicing the vines with machetes rather than using the special combines designed to cut and shell the beans. A pilot test covering the plant cycle from seed to harvest would have been one means of avoiding such a loss on a large scale.

Considerable care has to be given to the design of pilot projects. For example, the current emphasis on equity, income distribution, and delivery services could lead to a situation in which the social overhead components of projects might be so costly as to make projects too expensive to replicate on a large scale. A problem, especially for rural development projects, is to design them to be productive enough to cover most or all overhead costs. A basic objective of rural development projects is to reach large numbers of small farmers. In order to do this, it will be necessary to replicate projects or to have them develop into broad-ranging programs. This is likely to be an expensive operation, and it would be unwise to have heavily subsidized pilot projects if such projects cannot be broadly reproduced with primarily local or national funding. Experience indicates, furthermore, that projects in which the ultimate clients have a share of paying for the effort have a greater chance of succeeding. (See chapter 10, Finance, for a more detailed discussion of this factor.) (469, pp. 27, 28)

While there are no simple answers as to how this may be done, experience offers some approaches which have been relatively successful. The Puebla Project, for example, was initially concentrated on increased production of improved varieties of maize. Social overhead components were added as farmer incomes increased. The PIDER rural development program planned for 100 micro-regions of Mexico builds as much as possible on the successes of Puebla, and the plans for the project recognize the need to orient the program to self-support based on the Puebla approach for promoting rapid increases in rain-fed maize production by Mexican smallholders.

A leading development planner has suggested that high interest rates on loans may help to insure that projects reach small farmers. Credit at below market prices has tended to eliminate small farmers, because larger farmers with political power have often monopolized credit sources. High interest rates enable the credit system to pay for itself and to reach an increasing number of small farmers who are already often paying exorbitant credit rates. Making such rates applicable as soon as possible should be considered as one factor which would make projects more replicable in the transition from pilot to demonstration and production projects. (469, p. 28)

A pilot project should attempt to prove on a reduced scale what can later be applied and tested more thoroughly on a larger scale. Because of this, many theorists and practitioners have argued that the idea or product being tested in the pilot project should be tested away from the eye of the experimenter, under normal or representative conditions. (493, p. 92; 464, p. 6) The basis for this argument seems to be that if anything goes wrong under normal conditions it is best to catch it on a small scale; and further, that because special attention will not be possible during the production stage of a project, it is best to have standard or normal supervision during the smaller, pilot stage. The need to select an average or representative area is also based on other factors. In the 1950s and 1960s there were many instances of research into improved crops in which special plots of land were used, inputs were plentiful and controlled, and constraints such as pests and insects were excluded or minimized. The agricultural research stations were prime examples of this. Under such special conditions, extraordinary crop yields were possible. When new seeds or plants so developed were transferred to normal areas for growing, however, yields dropped dramatically, sometimes even falling below yields from traditional or unimproved seed. Further, farmers' practices could not be controlled or strictly supervised; in some cases no one knew what the farmers were doing. In light of this, the need to run pilot projects under more representative conditions became obvious.

There is a need, however, to distinguish among the components of a project those which should be handled under representative conditions, and those which require the best conditions which can be created. First, the community or ecological area selected should not be one which enjoys extraordinary conditions of soil, rainfall, or other natural conditions. Rather, it should conform to the areas where production will be taking place. A rural community, for example, should have about the average percentage of people employed in agriculture, average landholdings, per capita income, road networks and infrastructure. (464, p. 6) When considering the management needs of pilot projects, however, traditional practices have not proven to be acceptable. Project personnel, for example, are one of the most important stimuli which the project brings to an area. Rapport with local people and attention to the peoples' needs have proven to be essential factors in gaining acceptance of new practices. (464, pp. 10, 11) In some cases this approach has contrasted with a more formal and distant attitude held

by extension workers and other agency officials. Both Puebla and Comilla emphasized a close dialog with farmers and providing advice and services on an informal, though regular basis.

Pilot projects do not normally yield significant results in a short time. If crop cycles are involved. the period of testing can hardly be shortened, although more crops may be grown by increasing the number of cycles in a given period through irrigation. When social and cultural patterns and long-held individual beliefs are involved, patterns are slow to change. Farmers have in some cases clung tenaciously to traditional husbandry and cultivation techniques, even when their neighbors have experienced sizable increases in crop yields. In Puebla, some farmers did not participate in using new techniques for several years despite the fact that their neighbor's yields had increased.

c. Demonstration Projects

Although the terms "pilot project" and "demonstration project" have sometimes been used interchangably or in combination, there are differences between them, both in scale and objective. Whereas pilot projects are normally small-scale attempts to test new methods and approaches under specified conditions in one area, demonstration projects are usually applied in a larger area, or sometimes in several locations at once. And while pilot projects are more concerned with testing, demonstration projects are intended to exhibit new techniques and approaches and to diffuse practices which promise wide applicability leading to increased output, superior quality output, or both.

An example of this is the Masagana 99 rice program in the Philippines. The program was implemented through the experimental and pilot stages, then put into operation in selected provinces on a demonstration project basis. In the province of North Cotabato, comprising fourteen municipalities, 23,000 hectares were planted to Masagana 99 by the end of 1975. Special measures for implementation were devised, including Provincial and Municipal Action Teams which involved both elected officials and civil servants in coordinating all of the agencies involved in implementation. By mobilizing political and agency support at all levels from governor to extension agents and farmers, North Cotabato became the second highest producing province in the country under Phases I and II of the program. The success of the demonstration projects in this province and others has laid a basis for dissemination of results more widely. (505, pp. 49-53)

The scale of operations is significant for such demonstration projects as the one in the Philippines because many problems do not become fully apparent until a large scale of operations has been reached. In effect, more of the system is tested in demonstration projects because logistics and support mechanisms, a full range of personnel, and other needs must be met to integrate all of the organizational and physical inputs for a full province-level project. Knowledge, services, credit, and other materials

must be made readily available to generate farmer and village support required for adoption of the new procedures and practices. In addition to the Municipal and Provincial Action Teams. sub-programs in the critical areas of extension, credit, and marketing were important to the success of the project in the Philippines.

d. Production Projects1/

Projects which gone through one or more of the preceding stages, i.e., experimental, pilot, and demonstration stages, ordinarily move on to their final stage of full production.2/ By virtue of having made it this far, a number of serious implementation problems will have been worked out, and the strengths of the project should have been identified. The technology used in the project will have undergone testing and evaluation, and will be fairly well proven. Other problems continue due to the scale of operations and the number of organizations involved in implementation, often including governmental, private sector, and donor or lending organizations.

Mexico's Program for Integrated Rural Development (PIDER) comprises a project to alleviate rural poverty in 100 selected microregions of Mexico. PIDER is planned to be a full scale production project which would benefit some five million people when it is implemented in all 100 microregions. There is a long history of rural development in Mexico, dating back to the land reforms begun in 1911. These reforms, while comprehensive in redistributing land rights, did not provide administrative and supporting services which would allow needed broad increases in agricultural productivity. Major efforts at supporting land redistribution programs through further agrarian reforms came about during the Cardenas Administration (1935-41), when credit needs of the ejidos were recognized with the creation of the Banco Ejidal. The ejidos prospered through the use of credit inputs, establishing cooperatively-owned cotton gins, machinery centers, and other services.

During the 1940s, however, government strategy was changed, favoring private enterprise and providing little support for the ejidos. Industrialization and development of large-scale irrigated

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1/ Projects at this stage often have expanding the capacity of governmental or private organizations as one of their major objectives, and for this reason have been referred to as "capacity expansion" projects. See 535, pp. 17, 18.

2/ That is, their final stage as projects. A major objective of all projects is to make it possible to reach large numbers of people with goods and services. Therefore one aim will be to develop many projects into programs of services delivered on a more routine, continuous basis.

farming was emphasized, with benefits accruing primarily to large landowners. This policy resulted in a high sustained rate of economic growth for overall agricultural production -- an average of 5% from 1950-1970 -- but rural poverty of small farmers and other rural dwellers, especially in non-irrigated areas worsened measurably. Problems of rural development have been exacerbated by the rapid rates of population growth of recent years. Most of the population in non-irrigated rural areas is estimated to be able to find work only about 40% of the year. A lack of infrastructure and services has also led to increased migration from rural to urban areas.

In 1972, the Program for Integrated Rural Development (PIDER) was created to deal with the problems of smallholders and the rural poor in nearly 20,000 communities of 100 selected micro-regions having a population of about 9,000,000.1/ In these areas, it is planned that PIDER will integrate and expand development activities among all government agencies operating inthe rural sector. Small farmers' abilities to develop their holdings would be improved by providing access to credit, extension, all-weather roads, marketing facilities, increased educational opportunities, safe drinking water, and other inputs. It is projected that about 120,000 farmers would be expected to double their incomes by about 1985, and another 150,000 in irrigated areas would quadruple their present incomes within that time.

The objectives of PIDER are to:

(a) raise rural living standards by introducing directly productive activities;
(b) increase permanent and temporary levels of employment; and
(c) strengthen support activities and improve basic social infrastructure.

To achieve these objectives, the government has established PIDER coordinating machinery in the Secretaria de la Presidencia (the Secretariat), and has invested PIDER with a three-fold strategy: (1) concentrating investments and services of existing agencies on selected rural poor micro-regions which have productive potential; (2) decentralizing rural services to the state level; and, (3) encouraging village- and ejido-level participation in program and project planning and execution.

The Secretariat began to coordinate some activities of public agencies working in rural areas on a pilot basis in 1969. The major agencies participating in PIDER have created special departments or offices for rural development in cooperation with the Secretariat. About 2,700 professionals from these agencies are now working full time on PIDER programs.

1/ An average micro-region contains about 90,000 people living in three municipalities and surrounding countryside. Micro-regions must be poor, have productive potential, and lack basic infrastructure needed to attain their potential.

PIDER is organized on three levels: federal, state and village/ejido. At the federal level, a policy coordinating committee is chaired by the Director of Public Investment in the Secretariat, with membership comprised of senior staff of participating agencies. A permanent working group of technicians from the participating agencies supports the Secretariat, and in turn is supported by a group of technicians which is responsible for preparing and monitoring individual investment plans.

At the state level, the governors chair committees composed of state delegates of the participating agencies. An executive secretary for each committee serves as the state PIDER Director, and is supported by a technical secretariat and liaison officers from participating agencies. The secretariat coordinates day-to-day operations and maintains close contact with local authorities.

At the village/ejido level, attempts are made to organize communities to insure full participation in PIDER before PIDER activities begin. Municipal chiefs, ejido presidents, teachers, functioning village committees, and other responsible citizens are provided opportunities consonant with their local situations, to organize and promote active involvement and to serve as a link to the state level secretariat.

Under this three-tier arrangement, authority to select micro-regions and to approve investment plans remains at the central level, but responsibility for plan preparation and coordination increasingly devolves to the state. Operation of the plans is largely the responsibility of the villages and ejidos. Evaluation and monitoring of progress in each micro-region is conducted independently at all three levels, with locally based PIDER staff evaluating individual activities, local authorities and committees reporting to the state level, and federal level staff routinely assessing progress in each micro-region on an overall basis. Further, independent evaluation will be undertaken by a Center for Research in Rural Development (CIDER), which will also develop and guide overall training efforts and diffuse innovations. In addition to routine monitoring and evaluation, CIDER will commit teams which will be responsible for purposes of "feed forward," in which information on successful practices will be used in re-programming exercises.

PIDER contains most of the elements necessary for a viable rural development model.1/ Emphasis is given to directly productive activities necessary for self-supporting agriculture; labor-intensive activities to provide year-round employment; small-scale light

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1/ See chapter 3 for a discussion of a viable model for rural development.

industries; local self-help, with 12% of total project costs to be provided by beneficiaries, and involvement of village and ejido residents in planning and implementation; and changes in governmental organization which, if successfully carried out, will provide the organizational/institutional base for improved implementation. The sixth and remaining element of the model, an hierarchy of development centers, is not directly dealt with by PIDER. However, some of the functions of local service centers are carried out by a central marketing board (CONASUPO), which has jurisdiction over planning and management of public sector marketing facilities.

While PIDER has not been in operation long enough for a conclusive evaluation, early reports from micro-regions are promising. In Xochiapulco, the municipal president has provided federal officials with valuable information on local level problems. Sur de Nuevo Leon's state-level technical group is reported to have achieved a high degree of local participation in project planning and execution, while retaining the cooperation and respect of federal agencies. In Cosala-Elota, most village and ejido leaders are involved in planning and implementation. Nevertheless, in some micro-regions conflicts between officials at state and federal levels are said to be hindering progress, and in other areas, local participation is evolving slowly. In El Llano, for example, overrepresentation of involved agencies appears to prevent meaningful discussion of issues, a problem being resolved by the formation of local policy and strategy committees.

PIDER illustrates some of the differences between the demonstration and full production stages. In the earlier stages, most projects have needed the skills of research and a painstaking analysis of alternative possible solutions. In the production stage and even in some of the larger demonstration projects, an additional need has been the quality of entrepreneurship, of working with, exhorting, and coordinating multiple organizations to achieve production-oriented goals.1/

B. Project Identification and Preparation

1. Project Identification

Project identification has been defined as the preliminary determination of the nature, size, and number of potential projects and the establishment of some order of priority among them in relation to a country's overall development scheme. (537, p. 18)

The process of project identification begins with the seed of an idea, progresses to roughly defined projects, and moves toward more fully developed, better defined investment proposals.

1/ See the section on "Project Implementation" for examples of coordination and entrepreneurship in production projects.

Throughout the process, administrators, planners, managers, must make a sequence of decisions about which problems are most pressing, which objectives must be met based on priorities, and which ideas for projects seem most promising as possible answers to the problems faced. As the identification-selection-formulation moves from idea to completed project proposal, risks will decrease as more complete and detailed information is collected and redefined to shape the design of the project.

The impetus for identifying new projects comes, in practice, from a number of sources. Within countries, these include existing technical ministries or agencies, legislative bodies, political parties and leaders, private entrepreneurs and the public at large. External sources include bilateral and multilateral donor and lending organizations, political agreements, private entrepreneurs, and private voluntary organizations such as CARE, Church World Service, and others. (503, p. 73)

a. Sector Surveys

A variety of techniques and approaches has been used to identify projects. One of the most effective of these, experience indicates, is by carrying out sector studies. A sector study is an analysis of a sector which provides the basic information for a coordinated development program for the sector, including a preliminary identification of the most promising projects.1/ Sector studies usually indicate the role which a sector plays in the development of the overall economy, and provide estimates of the goods and services which the sector is expected to produce. Such studies also estimate the natural, financial, human, and other resources and output capacities available in the sector to provide the expected goods and services. Drawing on all available sources of information, these studies provide a good indication of the types of projects needed to meet future requirements, and may also indicate the priorities among these projects. (538, pp. 14, 15; 539, pp. 53-55)

Sector surveys have identified regions and areas of the country with a high potential for rapid expansion of output. The Forest Industrialization Plan for Mindinao, in the Philippines, identifies areas for timber, wood pulp, and wood by-products production, and recommends that a research project be carried out to identify projects leading to an integrated program for development. In many

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1/ What is "most promising" will depend on the national objectives of the country involved. Export promotion and equity, as objectives, would not be expected to generate the same set of projects, though in the actual selection and design of projects, it might be possible to harmonize these two seemingly conflicting objectives to some degree.

cases, sector studies do not spell out projects in detail, and they may only recommend that more specific studies be conducted. Kenya's experience in utilizing sector surveys indicated that there was a whole range of project types which could be used for pastoral development. Sector studies there have recommended further investigations of a number of project possibilities, with consideration given to matching national needs and the needs and interests of pastoral people in designated areas.

In Zaire, sector surveys emphasized the importance of improving the transportation network as a precondition for large-scale agricultural development. Prospective projects which were identified included opening and repairing access and feeder roads and river crossings, strengthening the existing network in order to accomodate expansion of agricultural exports from the Cuvette Centrale, and in the longer term, to supplement the present export-oriented system with links that would make possible a fuller exploitation of regional productive potential.

Theorists and practitioners agree that it is desirable for organizations in developing countries to be as much involved as possible in carrying out the sector studies even if these organizations are not prepared to carry out the studies entirely on their own. (503, p. 73) An analysis of 12 sector studies carried out by AID concluded that planning and project staff in Costa Rica and Ethiopia appeared to have gained substantially from participation in the studies, while personnel in some of the other countries seem to have suffered from lack of participation in similar studies. (540, p. 26) How countries may undertake a sector survey with outside assistance is dealt with in Chapter 6 and Annex C.

Where it is possible to use it, the sector study is the preferred way to identify projects because sector programming based on the study is the most logical link between macroeconomic planning (national plan formulation) and microeconomic planning (project level). The sector therefore becomes a bridge between plans and projects. However, not all countries are prepared to conduct a sector study at any given time. Further, a number of countries will recently have completed sector studies, and even if these studies did not follow the criteria set forth herein, or if they were not comprehensive, countries cannot conduct a new sector study often, or on short notice. Where this has been the case, planners have had to rely on currently available data and data from special studies until a more comprehensive sector study could be undertaken. In most cases, the major portion of existing sector studies concentrates on economic and financial analysis. Because the organizational, managerial, and social aspects may be equally important in determining project success, as already identified projects pass from the idea stage to preparation, it is often necessary to conduct feasibility studies which take all of these factors into account. (425, p. 59)

The process which countries aim to establish is the continuous generation of projects. Using this approach, while some projects are in the idea stage, with objectives generally set forth but not

articulated in detail, others are in more advanced stages of preparation, from those with preliminary studies completed to those which are being appraised and are nearly ready for implementation. Through this process of project identification and preparation, it is possible to impart a realism to national plan formulation which does not exist when plans are drawn up with no idea, or only a hazy idea, as to what projects will be undertaken under the plan.

b. Special Surveys and Studies

The major product which has often resulted from the process of identification and selection has been a set of project proposals. At this stage, information from sector surveys, pre-feasibility studies, sample surveys, and other assessments of people's needs allows planners to formulate proposals in enough detail to establish sectoral priorities for an investment program. For some small-scale, relatively simple projects, there may be enough information at this time to prepare a preliminary project design. More often, however, design has begun before adequate research was undertaken, and as a result, key issues were omitted from the final design. Organizers of land use schemes in one country, for example, began a project utilizing low-value land without checking to see who owned it. Once the land became productive, the owners came forward to claim it, reaping the benefits of land improvement brought about by the project. (331, p. 96) Evaluations of projects in many countries cite the deficiency of basic data to plan projects properly, and the need for more thorough studies to prove whether they are in fact feasible undertakings. For more complex projects, therefore, more detailed studies are often necessary before the project design is attempted.

Frequently, the next step following a sector study is to conduct an intensive special inventory of selected areas of the country where projects seem likely in order to gain a more detailed idea of problems and potentials. In Guyana, this was done as part of a survey of foodcrop production. A survey of nearly 350 farm units in four sample localities was completed in order to classify and describe foodcrop farms, with a view to evaluating production potentials, identifying constraints to their realization, and proposing actions to overcome those constraints. (541, p. 148) In some cases, surveys and studies at this point may result in a recommendation that a project should not be undertaken. In a survey of Sri Lanka's agricultural sector, some types of projects recommended in the development plan were found to be important for implementation in the longer run, but not of a high-enough priority to warrant immediate investment. Recommendations were made, therefore, for projects and programs which promised a relatively quick response time rather that those which have a long gestation period between investment and benefits, such as irrigation and colonization. Whether or not a project results from a preliminary study, the study is not necessarily a waste of time and resources. If a project does result, the design should be more effective as a result of the study. If a decision is made not to go ahead with the

project, the wrong allocation of resources will have been avoided. If it is postponed because its priority is judged to be low in terms of sectoral and national objectives, it may still prove to be useful at some later date. (503, p. 75)

c. Assessing People's Needs

Rural people have proven to be an essential source of information for project ideas. During the stage of early inventory of area conditions made to assess project possibilities -- as in all subsequent phases -- it is essential, therefore, for planners and managers to assess the information which can be supplied by rural people in possible or proposed project areas. The intensive and patient research conducted by the staff of the Comilla program indicates the value of this. The researchers of the Rural Development Academy who carried out the Daudzai Project in Pakistan also learned that the rural people are in the best position to identify their needs, and further, are capable of suggesting solutions to their problems. In this case, working with technicians and engineers, the local people translated these solutions into implementable actions. The development plan prepared on the basis of the people's assessment of their needs varied significantly in Daudzai from an earlier approach suggested by the planners. The significance of the people's participation in this case cannot be overemphasized. However, the support and technical knowledge of the planners was also essential, as leaving self-help to the people without providing assistance has often proved to be no more than a hopeful gesture. (497, p. 8; 37, p. 8) In some areas, farmers have been described as lacking the ability and structures to state ideas of their own needs. In such cases, there is a need for officials in the planning and implementation structure to facilitate expression of farmers' needs and objectives -- being careful not to supplant farmers' objectives with their own. At this stage, large-scale socio-economic surveys are not called for. Rather, a more general assessment of needs based on a sampling procedure has often proved to be adequate. (542, p. 27)

These measures suggest a bottom-up aspect of project identification which in some cases, such as Daudzai and Comilla, have generated ideas for projects which supplement those coming out of sector studies. Both are valid sources of information, and should be used as fully as possible. Rather than relying on either the sector survey or information gotten from area residents as exclusive sources of ideas for projects, such ideas are best gathered from all available sources and analyzed appropriately for their value. This is no less true of ideas that come from political sources. (46, p. 60)

When enough relevant data on the needs and possibilities for an area have been gathered, and ideas for projects have been drawn up in rough, preliminary form, more detailed, but still tentative project proposals can be prepared. The objective at this stage is to assess a wide range of possible projects, and to select for further development those which offer the best known solutions to the set of development problems which have priority.

In some cases, individual projects are so obviously needed that there are few questions about their priority. For example, where large portions of crops are ruined by spoilage, storage facilities are clearly needed. In Kinshasha, Zaire, processing and warehouse facilities for coffee became woefully inadequate to handle programmed exports. At the same time, port congestion became an acute problem for other export commodities as well. Construction of a multi-purpose warehouse was clearly called for, and a proposal for this was made.

In other cases, compromises are necessary between projects that are ready for financing but which rate fairly low on sectoral priority, and those that are of greater importance in the sector but which need considerable preparatory and pre-investment work before sizable investments can be made. This was the case in Sri Lanka, where a reasonable compromise was worked out by proceeding with major irrigation and colonization projects for which some (political) commitments had been made. At the same time, studies and preparatory work were begun for those programs with a longer-term priority. In this way, these longer-term prospects could absorb investment capital in the later years of plan implementation.

Some planners argue that it is a serious error to limit project choices too much at this point by choosing a particular kind of project. If irrigation, for example, is seen as the dominant way to increase productivity, other important elements may be ruled out for later consideration, such as equally necessary projects to provide drainage, farm to market roads, or credit. (542, pp. 30, 31) Others point out that the projects which get high level attention and the bulk of the resources are often those with the greatest visibility, rather than those with high economic payoff and low capital intensity. (236, p. 2) In practice, investment decisions are often made on the basis of prejudices for a certain type of project, or for political reasons, because well-prepared projects are hard to come by. (538, p. 49) This makes it all the more important to put forward enough good proposals at this stage, so that a good investment program can emerge from the projects which survive early screening.

2. Preparation

a. Feasibility Studies

If projects are authorized on the basis of incomplete information, it is more likely that difficulties will arise during implementation because important variables will have been overlooked or not related to each other. The process of project development therefore requires that studies be undertaken to assess the factors bearing on the success of the project. These are the technical, managerial, organizational, commercial, socio-cultural, political, financial, and economic factors which will determine a project's success or failure. These factors are often closely related, and a study of one of them usually sheds light on some of the others as well. It is the aim of the feasibility

study to produce the information necessary to determine whether proposed projects can be carried out using sound principles, and if they can, how they can at a cost which is lower than the contribution they can be expected to make to the country's development. (538, p. 15; 537, p. 18) Projects which rank highly on all of the feasibility studies are considered priorities for action within the sector. In the case of conflicting outcomes to the studies, such as a potential high employment effect but an indication of little foreign exchange earnings, preference is given to those projects which are most consistent with national, regional, and sectoral goals. (35, p. 9)

In practice, far more attention has been paid to analysis of economic, financial, and technical aspects of projects than to the other areas. Highly sophisticated techniques of analysis have been developed, initially to deal with infrastructure, engineering, water-basin development, and industrial projects. However, as these techniques have been applied to agricultural, and more recently, to rural development projects, modifications have become necessary. It has become more widely recognized that undue reliance should not be placed on any one criterion in order either to select projects which make up the development plan, or to analyze the components of a single project. (187, p. 146; 543, p. 30) The relative lack of information for appraising the social factors of projects, for example, makes the calculation of their effects on the project more difficult. But since their consequences for the project may be vital to project success, it is necessary to consider them explicity in project preparation and appraisal. (416, p. 7; 543, p. 30) It is equally as important to be aware that all techniques of project analysis embody certain assumptions, and that identifying and dealing with these assumptions during appraisal will also increase the chances for project success.

Each of the major factors will be dealt with as they bear on preparing the project for authorization and implementation.1/

(1) Technical Feasibility

Technical feasibility analysis allows the soundness of the project to be determined from biological, physical, and other technical viewpoints. Such factors as project location, access to goods and markets, and other input-output relationships, the scale of project activity, the machinery and equipment needed, livestock or seed inputs, and ecological side effects must be considered. (542, p. 132; 538, p. 17) Labor-intensiveness vs

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1/ A wide range of publications deal with the application of economic and financial analysis, cost-benefit analysis, derivation of internal rates of return, and other techniques in common use. These techniques will not be dealt with exhaustively herein, but outstanding works will be referenced.

capital-intensiveness and the degrees to which they can effectively be intermixed is likewise important from a technical as well as an economic viewpoint.

There are obvious connections between technical and economic analysis. One such connection deals with the scale of a project over time. In Paraguay, for example, unpaved all weather roads proved adequate for the first stages of a project, materially reducing the costs of the roads for the first few years of their use. As more people began to use the roads later, their quality was up-graded to accomodate more traffic. (538, p. 19) To build a dam where small-scale irrigation from wells would adequately fulfill needs also might not be justified technically, and economically considered, would be a waste of funds. Usually it is only in circumstances in which climate, soil, crops, and marketing possibilities are in accord that a major irrigation project is economic. (331, p. 96) This has been recognized in Nigeria, where small trail farms and pilot projects have been used as test areas to determine whether irrigation needs could be met by small-scale irrigation, rather than to invest scarce resources in a large-scale effort which might not be needed. Major physical factors which are assessed in technical studies of irrigation projects include the amount of irrigable area, the amount of water which can be made available on the average, whether all available water will be used and when it will be used (often ten years or more passes before water facilities are fully used).

Changes at the farm level by project participants also requires technical analysis. Farm level changes often include use of new production techniques, new agronomic or husbandry practices, such as use of improved seeds, or new enterprise combinations, such as inter-cropping. (542, p. 147) If new seed is to be used, technical analysis should show whether available supplies are in reach of farmers in time for planting, availability of extension services and training in use of new hybrids, role of demonstration plots, and price of the new seed. (20, p. 48) Adequacy of fertilizer, pesticides, weed control and other inputs may be essential. (544, p. 20)

In projects involving construction, scheduling of work and logistical requirements is based in large degree on technical analysis. Such techniques as PERT and CPM are helpful in this respect, but at the preparation stage should be done only in a sufficient degree of detail to deal with the most significant project factors, since there are nearly always considerable changes before implementation which will require a redraft of PERT/CPM networks. (See Annex E, "Project Work Scheduling and Review" for details).

(2) Managerial Feasibility

Studies of managerial capability have often revealed a shortage of qualified managers to undertake new projects. This has led to widespread hiring of expatriates in some countries, especially in West Africa, and in the conduct of large-scale training programs

to develop increased managerial capacity in-country. Often the shortage of qualified manpower relates directly to project planning. A survey of the agricultural sector in Nigeria in 1971 found not only a serious shortage of planners and technicians at the federal level, but in most states as well, which led to inadequate project preparation. Nigerian officials at the federal level realized that agricultural development was restrained not so much by shortage of finance, but more by the sector's absorptive capacity because of the bottleneck in planning and preparing projects. In Kenya, a project to facilitate inter-farm exchange of grade cattle was disappointing because institutional and staffing problems were not dealt with. An ex-post evaluation stated that additional expert staff in the extension service would have greatly increased chances of success, but Kenyan officials, for policy reasons, did not want to fill positions with expatriate personnel.

In practice, if a specific project is to be undertaken, there may be no alternative to importing foreign management. This practice, if undertaken for extended periods of time, may hinder authentic development programs within the country. Though undesirable, they may remain a short-run necessity. It is extremely important that training of local staff should be arranged, however, so that foreigners may be replaced as soon as practicable. An appraisal of managerial feasibility, therefore, will assess the need for training programs for the creation of competent staff at all levels.1/ The analysis will of course have to deal not only with how many trained people are available, but with how their training equips them for the specific project objectives or problems which are to be dealt with. In Mexico's PIDER Program sufficient numbers of extension agents were found to be available at the outset, but the training they had received in technical colleges was said to be inadequate to equip new graduates to give advice to small farmers. Not only was there a lack of emphasis on the problems of small farmers but training had little transferability from one area to another -- for example, from Mexico's dry, temperate North to the wet, sub-tropical South. Special short courses were run to overcome these deficiencies to prepare for implementing the PIDER Program.

In numerous projects when appraisals have not adequately considered management needs, the results have been serious. In Tanzania, beef ranching projects were set back because ranch overhead costs were excessive. Poor ranch management there reportedly led to annual overhead expenses which by themselves were higher than gross revenue from cattle sales. Returns to the project were of course lower than estimated.

1/ See also chapters 13, Extension; 14, Training; and 15, Consultancy Services on the development of appropriate training programs.

(3) Organizational Feasibility

Organizational analysis deals with the kind of organization needed to carry out the project. In theory, this analysis allows one to determine how many and what kind of people are needed, and how they should be organized best to meet the problems with which the proposed project is to deal. This includes consideration of where the organization should be located. For example, should it be within the ministry of agriculture, within a separate parastatal corporation, or set up as an independent entity? The nature of the organization will also have to agree with the objectives of the project as well as with the target audience. As one leading development practitioner has observed, a project to deal with the problems of pastoral nomads in Africa might benefit from an arrangement in which technical experts meet the nomads at specified points along their journey, rather than be administered from some fixed point neither readily nor frequently accessible to the nomads. Another consideration is whether the project is based primarily on the provision of technical services, such as those which dominate contract extension, or whether it relies more on substantial problem-solving inputs from farmers and rural people.1/

In practice, organizational analysis and recommendations for the type of project organization have varied widely depending on who has sponsored the project. The World Bank, for example, has most often recommended the establishment of new organizations to carry out projects for Bank-financed projects. One argument for this is that more ably qualified employees can be hired for the project by establishing pay rates and classification systems outside of civil-service scales. The U.S. Agency for International Development, by contrast, has more often favored projects which are carried out through existing organizations. Experience shows that when this approach is taken, greater success has resulted from introducing changes slowly and by introducing only those changes necessary to meet specific objectives. Too many times, changes have been suggested in order to achieve conformity with a proposed model, rather than to achieve specific project objectives.2/

Organizational analysis has also been necessary to insure that accountability and reporting subsystems in organizations will be adequate. Organizations need to produce reports on current performance promptly, to check these against past performance, an make appropriate projections so that management can make

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1/ See chapter 13, "Extension and Research," for a discussion of these major methods of extension.

2/ See chapter 12, "Organization," for a more detailed discussion of minimum necessary change.

necessary decisions. Budgetary systems are needed to supplement control and scheduling and in many cases, for preventive maintenance. (538, p. 28)

(4) Commercial Feasibility

Commercial aspects of projects are appraised to insure that adequate arrangements have been made for buying the necessary goods and services needed to start up and operate the project. This requires that effective competition be established among potential suppliers and contractors, such as by requiring competitive bidding. The competency of the firms from whom bids may be solicited should also be assured.1/

(5) Socio-Cultural Feasibility

Evaluation of numerous projects has indicated that social and cultural factors have often been overlooked or inadequately considered. In Ethiopia, the CADU strategy led to problems because the basic design borrowed from Comilla did not adequately consider the differences in land tenure patterns, tenancy rates, and local elite interest. The necessary anthropological background studies came too late and contained insufficient data to offset implementation problems. (545, p. 341) New-input technology produced by CADU could not be managed by small farmers in some cases because farmers' norms called for observance of numerous holidays by Coptic Orthodox Christians. CADU's marketing organization was seen by some local merchants as a threat to their survival, resulting in violent attacks on CADU employees. (546, pp. 35, 36) In part these problems derived from a project team dominated by foreign scholars, who did not include Ethiopians directly in the field surveys or in project design. While sufficient technical data seems to have been collected, institutional and social data were lacking. (546, p. 17)

Projects in Mexico and Bangladesh provide a meaningful contrast to the foregoing. The Puebla Project and the PIDER Program, which drew on the Puebla experience, intensively researched socio-cultural factors. In Puebla, a survey of campesinos showed that a majority did not want to get involved with their neighbors in any joint enterprise. Many cited failure of neighbors to repay loans, corruption of government agents who sponsored the activity, and other factors. (459, p. 268) George Foster has shed light on this belief with his theory of the "Image of the Limited Good," which refers to a belief held by many peasants that there is a limited amount of good things in life, and that one can gain only at the expense of someone else. Since it is also believed that there is no way to increase the amount of "good" available, many peasants prefer not to court trouble by performing cooperative

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1/ See chapter 15, "Consultancy Services."

tasks with their neighbors. (459, pp. 491, 492) While some of the Puebla campesinos were able to shed this belief, others still did not participate in the project after seven years of operation. What the study showed, however, was that extraordinary care would be necessary to deliver services and assist overall production in such a way that the idea of limited good could be supplanted when people saw that a situation in which everybody wins could be produced.1/

The need for systematic analysis of social conditions and the way they affect project success fortunately is becoming more widely emphasized. USAID in 1975 circulated guidelines to its field missions for Social Soundness Analysis. These guidelines recognized the fact that socio-cultural factors are a part of the "real features of the terrain on which the project is proposed to operate," and recommended specific questions and areas to be considered in this part of project appraisal.2/

(6) Political Feasibility

Where political policies and practices have come into serious conflict with project objectives, project implementation has had a rocky road. CADU was one of many projects to suffer because of this. Too late -- well into implementation -- CADU officials realized that the local government system was inimical to project objectives. Further, by not having been aware of this earlier, during the appraisal or design stages, any chance to bargain with the national government for local reforms was lost. (545, pp. 352, 353)

The importance of political support to the success of the Puebla Project has been widely recognized by Project leadership. The two initial conditions considered necessary for selecting a site were: 1) an ecological environment which would allow substantial increases in maize production; and, 2) a favorable political environment. (271, p. IX) In Comilla, a key program objective was to make local government more responsive to the needs of rural people. The model for the Comilla thana was based on a combination of local government support, departmental (civil) service assistance, and public works infrastructure projects.

1/ The peasants' theory is not so ridiculous when one realizes that some people usually do lose as a result of most development projects. Were this not so, there would be no short-run basis for equity objectives which concentrate on redistribution.

2/ See 501, Project Assistance Handbook, Appendix 5A.

The need for political support was as critical as support from the ministries responsible for delivery of services. And in the end, it was a coalition of urban politicians, moneylenders, traders, and contractors who brought Comilla's progress to a halt, through political pressure. (281; 497)

Several aspects of political feasibility need to be studied. Enabling legislation often provides information about the government's intent to carry out a program. In some cases, strengthening of legislation or drafting of new legislation have been called for. While accomplishing this is beyond the capability in most cases of an individual technician or planner, through their analysis and reports, the planner and technician can bring conditions of inadequacy to light. Similarly, political support at all levels can be assessed and many actual or potential problems identified before project authorization, thus avoiding situations such as that which plagued CADU. Unlike Comilla, from which guidelines were supposed to have been drawn, CADU did not provide for the training of local public officials. In consequence, CADU faced hostilities from officials who were opposed to its innovations, in part because they misunderstood the intent of the proposed activities. (546, pp. 37, 38) It is with such realities that political feasibility studies should deal.

Other factors with which political leaders will be much concerned include the impact of employment (total number of people, their skills, and the area from which they come) and project income which is forecast. While these factors will have to be analyzed from the social, financial, and economic viewpoints also, their political importance is undeniable. Political support has made the difference in otherwise undistinguished projects numerous times. (542, p. 10)

(7) Financial Feasibility

Financial analysis must provide answers to questions about the estimated project costs and revenues: what funds will the project need to operate, where will these funds be secured, what is the estimated profit of the operation? If individual farms or other producing units are involved will the income per unit be a sufficient incentive to production? At the institutional level, will the returns to banks and lenders be adequate? Will projected sales come at the right time to allow a farmer to meet his loan schedule? (542, pp. 214, 215)

While economic analysis indicates the returns from the project to society as a whole, financial analysis shows the returns only to project participants. The same type of discounted cash flow techniques are used as in economic analysis with the exceptions that prices are market prices. Further, through use of a

worksheet, the financial data-cash flows and annual income and expenses are indicated for each participating group or entity. From these, aggregate cash flow for the entire project can be calculated.1/

The individual project participants may include individual farms, cooperatives, farmer associations, credit unions, and other groups. The financial condition of these units must be analyzed to be sure that there is sufficient farm family income and enough incentive for participating farmers. Farmers must be able to invest money profitably enough in new practices, and be able to sell their crops and animals at the proper time to meet a repayment schedule. (547, p. 4)

It is not unusual for financial analysis to show that a public entity will not earn enough to cover all of its costs. Irrigation authorities have sometimes not assessed farmers a water charge, but the projected increase in farm output has made the projects attractive from an economic standpoint (i.e., for the economy as a whole even if not for the irrigation authority if considered alone). Financial analysis can reveal that a subsidy is required, what the amount of the transfer payment is likely to be, who will receive it, and how the recipient's financial returns will in turn be affected.1/

Financial analysis should reveal, first, the amount of money needed to bring a facility into operation and the sources from which that money is to be obtained, and secondly, the probable operating costs and revenues. For projects which are not designed to produce revenue, such as education projects, or the health component of a rural development project, financial analysis is concerned mainly with the sources and adequacy of funds for starting and maintaining the activity.3/

1/ See 542, chapter 6, for samples of worksheets and details of one analytical approach.

2/ See 542, chapter 6, for a detailed treatment of how to carry out financial feasibility analysis, including a full array of worksheets necessary to determine costs to each entity involved in the project.

3/ Analysis can only be applied, however, to a project with a finite time horizon, and not to a program of services which has no projected end point.

(8) Economic Feasibility

Economic analysis is used to determine the desirability of carrying out the project from the standpoint of economic efficiency. Whereas financial analysis deals only with costs and returns to project participants, economic analysis deals with costs and returns to society as a whole. Economically efficient projects are those which add to the national income. (544, p. 11) The techniques of economic analysis are well-known and have been dealt with exhaustively elsewhere. Here, only selected principles will be covered.1/

Analysis needs to distinguish the difference between what will happen with the project in place and what would happen if it were simply not undertaken at all (the "with-without principle"). In Puebla, such an analysis indicated that increased yields in maize production might have occurred even if the proejct had not been implemented, probably through more intensive use of 10-8-4 mixed fertilizers. However, such yields would have been limited to commercial and semi-commercial farmers, who made up only about 15% of the farmers in the Project area. One of the Project's chief evaluators has concluded that overall, gains without the Project in place would have been minimal. (459, pp. 480-482)

Since there are often alternative ways of dealing with the same problem, it is invariably recommended that project alternatives be compared in terms of efficiency. In practice, this is seldom done very thoroughly. More often a "straw man" is set up with data that are "guesstimated" rather than investigated. The lack of trained manpower in many developing countries adds further to the problem of fully exploring alternatives. However, the problem is not impossible to solve, although it may have to be approached in stages, over a period of time. Using the stocktaking and diagnostic survey (discussed in chapter 6 and Annexes C and D), alternative project approaches are more likely to be identified. Further, in some cases it will not be necessary to do an exhaustive analysis to see that some project approaches provide lower returns than others, or that some approaches are not consistent with national, sectoral, or regional goals. Thus, the total number of detailed analyses which would have to be undertaken is not likely to be large.

In Iran, a rough cost-benefit analysis of large-scale irrigation projects was compared with projected returns from small-scale irrigation projects. Even from this rough analysis, it was possible

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1/ For details the reader is referred to: 544, Manual for Preparation and Analysis of Agricultural Projects; 548, Economic Analysis of Agricultural Projects; 501, Project Assistance; and 549, Farm Surveys.

to conclude that returns from big dams were likely to be far less than the yield from a series of smaller irrigation projects. Under conditions of imprecise data that prevailed in Iran, devoting further efforts to computing benefit cost ratios would probably not have yielded better results than those resulting from the rough comparison. (30, p. 73) In Nigeria, small-scale irrigation was also advised as the most economical way to reach smallholders. Trial farms and pilot projects were favored until it could be demonstrated that smallholder farmers were oriented and organized in sufficient numbers to adapt to a more concentrated agriculture which would be necessary to make a large irrigation system pay off.

Comparison of costs and benefits are generally based on prices. In economies in which market forces operate freely in the presence of domestic and international competition, actual prices of all factors or production can be used to make the required calculations. But in the real world, and especially in the real world of low-income countries, prices of many items do not usually reflect supply and demand. One may find all sorts of distortions in the price system; for example, protective tariffs and quantitative restrictions on imports and exports; or unrealistic rates of exchange which undervalue or overvalue a national currency; government controls over interest rates which may make it possible for public enterprises to borrow at rates below those prevailing in the open market; or government or private monopolistic controls over production, prices and sales; wage rates which are higher than the real cost of labor because of government or union intervention.

These distorting factors can make an appraisal of the social or economic merits of a project based on actual prices both incomplete and inaccurate. Sometimes, enough information is available to adjust market prices to the level of "equilibrium" prices (i.e., to the level required to equalize supply and demand). Such prices are, of course, known as shadow or accounting prices. When shadow prices are substituted for market prices, costs and benefits expressed in market prices can be converted to quantities which give their real economic value, thereby making it possible to compare projects.1/

In this way, a project which yields a high return on the basis of market prices may be shown to yield a low or even a negative return in real terms, and vice versa. For example, a government project financed with a central bank loan at a rate of interest well below the real cost of money in the country, might be shown with a shadow or equilibrium interest rate not to be as profitable as it appears when the interest charge paid is used; or in appraising

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1/ Techniques for derivation and application of shadow prices vary. Little-Mirlees, UNIDO, and the World Bank guidelines may be referred to by readers seeking a detailed account. The World Bank publication, Readings on Project Analysis Methods, contrasts the major approaches.

a project which is taxed at a high rate, which means, in effect, that the project is sharing its profits with the government, it would be necessary to include the tax as part of the project's income in appraising its social profitability; where a project (e.g., a power plant) sells its product to other public agencies at a loss as a subsidy to these other agencies, it is necessary to substitute a higher shadow price in calculating the project's profitability. Projects that are socially profitable but which incur a loss on the basis of market prices may have to be subsidized as a matter of public policy.

Sometimes a project, like a road that opens up new agricultural areas, has costs, but no revenues. Here, profitability is measured by the increase in incomes of the farmers who are in the area, minus their increased costs, plus the cost of the road. The same kind of calculations would be used for projects in which products are sold at less than cost in order to stimulate new industries by making the latter more profitable.

While it is possible, in theory, to calculate shadow prices for most projects, in practice enough information may not be available to determine such prices. Once again, therefore, qualitative adjustments often have to be made.

When it is possible to calculate shadow prices for every factor, or when market prices reasonably approximate equilibrium prices there is still the question of what economic criterion should be used to select investment projects.

Some economists think social profitability should be the only criterion for selection, but most would concede that other criteria also have to be considered. Thus, where unemployment is a problem, the less profitable of two projects which employs a larger number of people may be more desirable. The profitability criterion <u>may</u> lead automatically to the selection of projects that will employ the most people; but it may not. Where labor is cheap and capital expensive, it is easy to calculate a correction factor which shows that the greatest profit arises from labor-intensive rather than capital-intensive technology. But where technology is advancing so rapidly that productivity outstrips demand (as often happens today) machine technology may be superior to hand labor even if labor costs are very low. This can happen because machinery sometimes saves more in working capital than it costs in fixed capital, thereby requiring not only less labor but less capital (the so-called "factor proportions" problem). Hirschman has correctly pointed out that even when more capital is required, it may be economically justified because poor management or inefficient labor may waste more time and materials with hand labor than a machine would. If the savings produced by the machine are great, the profitability criterion would not lead to projects which employed the otherwise idle labor.

Hence, if the profitability criterion is used, the development projects selected will not necessarily reduce unemployment. Economists who believe in the use of the social profitability criterion at all times justify their position by pointing out that the most profitable projects can contribute the greatest amount of resources with which to assist the unemployed through social welfare programs or through "make-work" programs. They argue that this is much better than selecting projects on the basis of their employemnt potential because the employment criterion reduces output below a country's capacity. Here, too, the final choice depends on judgment. While it is true that the profitability criterion is likely to yield the greatest increase in income, it is not at all certain that governments will use part of the increased income to alleviate the effects of unemployment when scarce resources are needed for further development investment. In the end, therefore, some compromise between the two extremes may have to be made, with some projects chosen for their profitability and some for their ability to increase employment.

At the heart of economic analysis is cost-benefit analysis. Developed primarily in the United States for appraisal of water resources projects, cost-benefit analysis is used world-wide today, and there have been few projects which have not been analyzed to some degree using this technique. However, the practitioners of this approach have used it in many different ways, and some of these are more effective than others. In many cases, so much emphasis has been given to this approach that it has overshadowed other considerations of equal importance. A number of ex-post evaluations of projects, for example, have noted that in spite of cost-benefit analyses that seemed accurate enough, problems were encountered for technical reasons, or because managerial competence was not adequate, or because there was a lack of inter-organizational coordination. While it is important, therefore, cost-benefit analysis must be seen in perspective as a tool which, along with other analytical tools, can be used to devise a way to operate projects more effectively at a lower cost.

Two questions that will have to be answered by people preparing projects are: 1) when should cost-benefit analysis be applied; and, 2) how can it be applied most effectively. The question of when breaks down further into: a) to which projects can this technique most properly be applied; and, b) for the projects for which it is to be used when in the project cycle should it be applied.

Changing conditions during project implementation have often considerably changed cost factors, and therefore, the cost-benefit ratio. In Ecuador, estimated costs for a livestock development project were significantly increased due to a shortage of breeding stock. Because of the short supply of breeding animals, their price rose rapidly when many producers attempted to purchase them simultaneously. In this case, costs rose as a result of demands created by the project itself. In Tanzania, expenses for machinery

on a ranch development project were almost three times the amount planned, and total expenditure on physical inputs was higher than forecast although physical progress was considerably below target. Deviations such as these, however, are a normal part of adapting plans to conditions found during implementation.

The lesson for practitioners is that the results of even a well-conducted cost-benefit analysis cannot be assumed to be precise. Rather, they give an indication of what may be expected if assumptions about conditions to be encountered do not change during implementation. Further, it means that in longer-term projects, it will be necessary to reassess the costs and benefits of the project at intermediate points during implementation, in order to insure that the project will still yield benefits as originally conceived, or to effect changes that will allow the project to yield adequate benefits if reassessment shows that it has slipped off track.

The question of when cost-benefit analysis should be applied in the project cycle thus is answered: during preparation, to provide information on the potential costs of and returns from the project, and secondly, at appropriate intervals during the course of longer projects to reassess the original assumptions under changed conditions. Donor organizations, and sometimes ministries, have usually required such a reassessment before releasing a new tranche of funds for continuation of a phased project.

Problems have often been encountered in applying the cost-benefit technique. Indirect costs, for example, are sometimes difficult to identify (e.g., the cost of eliminating stream pollution from feed lot runoff). Even so, in nearly all cases costs are easier to identify and to give a value to than benefits. Services such as those provided by health clinics, family planning activities, educational components of projects, and other services and aspects for improving life quality without doubt provide important benefits, but these are often impossible to quantify. As has been shown, therefore, appraisal requires the exercise of some amount of subjective judgement based on experience and managerial intuition. (538, pp. 36, 37) There simply are no readily applicable, mechanical tests that can be applied to most projects to determine what its benefits will be. Nonetheless, it is still necessary to ask the right questions and to assess conditions as fully as possible so that no important considerations will be overlooked.

Increasingly, it has been realized that modifications of cost benefit are necessary for use in developing countries. The approach has come in for its share of criticism because it has been misused at times. Others have claimed too much for the accuracy and value of the approach, which can be no better than the data and assumptions on which it is based. The lack of accurate statistical data, rapid changes in the structure of the economy, and pressures within organizations to indicate a high rate of return on project investments can all lessen the effective use of the cost-benefit approach. Further, use of cost-benefit analysis requires a rather disciplined

approach which has often been difficult for inexperienced staff members to attain. In many cases costs have been worked out only to very rough degrees of accuracy, which has been due both to weak data leading to "guesstimating," and the use of broad assumptions. (14, pp. 573, 574)

The technique recommended here is to identify all relevant aspects of proposed projects, quantifying those costs and benefits for which data are available, and to which monetary values may be assigned without violating common sense. Errors of both omission and commission are possible: leaving out important factors, and assigning values to factors which cannot be quantified.

The Reserve Bank of India published a study on costs and returns on farm investments in four states of India. The results of the study indicated that in a large number of cases, investments in wells, pumps, and tractors was not economically worthwhile in the areas surveyed. Yet there has been a virtual boom in the production of wells and the sale of pumps and tractors. Analysis of the techniques used in the study's cost-benefit analysis showed that several factors had not been considered. These included benefits to farmers from sale of water, hiring out of tractors, and all costs and returns which would have extended beyond the termination of a loan repayment period to banks providing loans for purchase of the pumps, tractors, and for equipment for well construction.

One effect of the study as undertaken would have been to limit loans to larger farmers, because only larger farmers could have been expected to show a profit without selling water or hiring out tractors. Even some larger farmers would have probably been able to increase their benefits through sale of water. Farmers in some areas of India sell as much as 73% of their water. By recalculating the rate of return to include sales and rentals as benefits, and assuming a 50% increase in incremental incomes, projects based on sales to smaller farmers would have been reasonable. The incomplete analysis reported in the Reserve Bank study is thus indicated to have been invalid. (550, pp. 808-811)

C. Project Design and Implementation

The Comilla "problem-solving" approach to project design and implementation was cited as an example of one of the primary ways of developing and implementing projects. The approach emphasized the use of Comilla's area as a laboratory for social research on which an effort was made to develop workable models which would have wider applicability. Projects undertaken at Comilla included a network of cooperative societies and the construction of rural public works. The degree to which Comilla's inhabitants took part in identifying their priority problems and in developing solutions to those problems is rare. The innovations which were developed at Comilla and the way they were disseminated by villagers is also rare.

In 1970-71, Akhter Hameed Khan, former Director of the Comilla Program, made an evaluative tour of 20 thanas (administrative units of about 100 square miles) to interview people at all levels about the Comilla Projects, which included: 1) the Thana Training and Development Center; 2) the Rural Works Program; 3) the Thana Irrigation Program; and 4) the Cooperatives Project.

The Thana Training and Development Center represented the Government's concern for progress in rural areas, which was to have been brought about by a partnership between Government experts and rural people, in which the experts would become teachers and trainers of the people in those areas which the people designated as being of primary importance. The people's leaders or designates, whom they selected, received training and in turn trained groups of villagers. (497, pp. 22, 23) The Rural Works Program was designed to provide a network of roads, drainage canals, and embankments, and to give employment to landless laborers during the dry, idle months. The Thana Irrigation Program was to add to the Rural Works Program by providing irrigation facilities for dry periods. Drivers, mechanics and managers selected by farmers' groups were to be trained at Thana centers. A goal was to organize 40,000 irrigation groups which in five years might bring 2 million acres under cultivation for winter crops. Like the Rural Works Program, the Irrigation Program was meant to provide employment for landless laborers. (Ibid., pp. 23-25) The Cooperative Program was an attempt to organize small farmers, so that they could protect themselves from moneylenders and modernize their farming methods. Eventually, they were to lead to self-financing and self-management. All four activities -- training, rural works, irrigation, and cooperatives -- were to be mutually supportive, closely related means of changing life patterns in Comilla.

Khan relates that in practice the results of the Comilla projects differed considerably from what had been planned. The Training Centers were doing well, and were satisfying and stimulating demands for services and supplies from the Government. But attempts to foster continuing innovation through the Centers, and to keep them in a separate status from other bureaucratic agencies had not been successful. In the Rural Works Program, only about 10%-15% of the drainage and embankment plans had been carried out, although somewhat greater success was met in implementing road plans. Government officials no longer deemed systematic planning and full participation by local people to be crucial, and five-year plans for future activities were no longer being drawn up. The irrigation program had taken a fairly firm hold, with an increasing demand for pumps and tube wells and the formation of new farmers' groups. However, greater reliance was being placed on contractors than had been planned, at higher cost and with less participation by local people. As with the rural works program, there seemed to be little effort required by beneficiaries of the irrigation program, and pumps were given out more as gifts. The cooperative projects had survived under very trying conditions, as

governmental supporting funds had largely been withheld.1/ Small farmers had responded well, however, to two basic needs of cooperatives, thrift and repayment of loans. The proportion of their own capital of amounts borrowed ran from 25%-48% in different thanas, a significant contribution by small farmers. For the twenty thanas, defaults on individual loans ran from 0%-14%, with an average of 8%.

In its Development Assistance Program for Bangladesh (FY 1975), the Agency for International Development observed that the new approaches synthesized in Comilla were being replicated to many other thanas in Bangladesh, and formed the foundation for much of the rural institutional development in Bangladesh today. The Thana Training and Development Center has become the principal public institution designed to organize and serve farmers. All activities of ministry officers are coordinated at the thana level by a Thana Circle Officer for Development, who also serves as Secretary and primary implementing agent of the Thana Council. (392, pp. 70, 71)

These and other evaluations indicate clearly that the Comilla approach "worked" in the sense that they involved people and motivated them toward action for development. One element has been mentioned by Comilla's founder as well as other reviewers for inclusion in development programs is a research institution such as the Development Academy. The Academy served as the generator for the Comilla process, and beyond doubt could function in other settings by observing, surveying, and building improved models derived from the people's experience with development. (497, p. 19)

That it is not sufficient merely to copy the lessons of Comilla by transplanting the plans which worked there is shown by the experience of the Chilalo Agricultural Development Program (CADU) in Ethiopia. As noted, the Swedish International Development Authority (SIDA) team of experts studied the Comilla Projects to assess what might be transferrable to CADU. While the SIDA team spent considerable time collecting baseline data in Ethiopia, they used an outsider technician's approach. No Ethiopians participated directly in actual field investigations to plan the project or in the technical aspects of project design. Many institutional factors were overlooked, and the Government's commitment to change was overrated. (546, p. 17) Later, during implementation, although there was considerable evaluation and feedback on project activities, adequate information was not gathered on local social structure, group dynamics, and behavioral patterns of the target groups.

1/ The general conditions in E. Pakistan/Bangladesh -- a war, a near-revolution, and nearly continuous social upheavals -- of course hurt the chances of success seriously during the period of 1965-73.

Little was done to conduct a comprehensive or systematic survey of system components, such as human and natural resource characteristics of communities in the region. (546, p. 42) Political and social variables were not as thoroughly studied as economic factors on the assumption that they were less important. (545, p. 357) While the Swedish planners did well to analyze the lessons of Comilla, they adopted the procedures but not the principles involved. Nor was any local institution such as the Pakistan Development Academy developed in the CADU Program.

Important factors considered at Comilla were also overlooked at CADU, including the influence of local government institutions and officials. CADU was not perceived as a part of the regular provincial and district public administration network, yet because of its comprehensiveness it cut across many agencies and public jurisdictions. A dislike for the Program was indicated in many cases by a lack of cooperation and support at the woreda (local) level. The woreda governor discouraged attendance at CADU meetings and forced project supporters to come to him for assistance. As a part-time farmer, the woreda governor was also excluded from CADU credit under CADU's regulations. (546, p. 34) Comilla, by contrast, provided for extensive discourse with villagers and a feedback system involving the regular training of local farmers which would have provided information on key conditions which became barriers to progress at CADU. Comilla, for example, provided training for local public officials, while the CADU design did not provide for this, adding to the hostility found at CADU when innovations were attempted of which public officials were unaware, and therefore in fear of. (546, p. 37)

Further analysis of Comilla and CADU emphasizes the dramatic differences in planning, design, and implementation which existed. Comilla was flexible in its orientation to change, responding to local needs with appropriate modifications in thrust and scope of its projects depending on the scale of local needs and the capability of people to respond effectively to guidance and training. Lele has observed that the development experts who designed CADU did not relate strategy to land tenure patterns, tenancy rates, mechanization potential, price policies, local elite interests, local government administration, agrarian tax patterns, and other variables (545, p. 341) This is both true and valid, but further, the factor which underlies it is that CADU, unlike Comilla, was not oriented to people as people, but as objects who were to be planned for. In a services delivery or input delivery project, such as the Kenya Tea Development Authority projects, (see chapter 13) where the need for a high degree of technical input is necessary and this is recognized and accepted by the farmers, planning can be effective even if it is technique oriented and centralized to a fairly high degree. CADU, however, possessed many features more akin to problem-solving than to inputs delivery, especially in its early stages. It is of the utmost importance for project planners and managers not to confuse the essential nature of these two types of projects. Put another way, the approach and techniques selected must be appropriate for the project objectives.

1. Establishing Project Objectives

Nothing is more important in the life of a project than a clear statement of its objectives. As Peter Drucker has noted, objectives determine project activities and the assignment of people to tasks. Objectives are not abstract concepts, but commitments to action through which work will be carried out. Because of this, they need to be operationally oriented to allow key resources -- people, money, and physical resources -- to be concentrated. Therefore, they allow the best work to be done when they are selective, rather than trying to encompass too much. (384, pp. 99-101)

Objectives need to be realistic. They should be based on more than an aspiration, and do more than reflect a slogan. For example, there have been numerous projects with the stated objective of self-help. Experience shows, however, that people are often not prepared to engage in self-help activities at a level called for by the project at the outset. Rather, a phased sequence of activities requiring increasingly responsible participation is called for. In Mexico's PIDER project, during initial half-day meetings with micro-region planners, most communities were not sensitized to the possibilities for drawing up micro-region development plans. However, as development proceeded, members of the ejidal development teams played important roles in awakening people to the development opportunities and obligations in PIDER. When micro-region plans are revised annually, the PIDER teams, which include the villagers, incorporate the increasingly detailed preferences expressed by the communities.

In Pakistan's Daudzai Project, survey research revealed that the needs of villages in the Project area differed widely. The Project Managers were aware that the rural people in the area had already experienced frustration and disappointment concerning previous government-sponsored self-help projects. It was apparent that to leave development to the people of the area on an abstract basis of self-help could lead to further frustration. Therefore, the survey research was used as the basis for a development plan of the project area, based upon the diverse needs of the villages involved as identified by the villagers. (37, p. 8)

Objectives cannot be specified in any meaningful way unless it is known for whom they are to be carried out. Who is it that is to benefit? Determining a target group therefore becomes a central process, as shown by the Daudzai experience. When the target group is clear, the design of the project to meet its needs is much easier. (469, pp. 52, 53)

An example cited by one veteran official of AID involves livestock projects in West Africa, where there was a growing imbalance between animals and rangeland. A traditional U.S. approach might have been to fence in the rangeland and to coerce cattle owners to graze within the fenced areas. If the owners of cattle are nomadic, however, as six million Africans are, fencing the land is not an acceptable solution. The AID official suggests that people are

needed who can develop systems that are compatible with both the governments' and the nomads' needs in order to manage the range more efficiently from both points of view. (469, pp. 43, 44) One way to do this, he suggests, might be to have one or two permanent technical advisors in the field who would arrange for periodic consultations with the people affected by a project and any experts who could give relevant assistance. At a few specified times in a year meetings could be held with the nomadic groups at selected spots on their migratory circuit. Discussions could be held with the group on problems they are experiencing and a system for dealing with the problems developed that would be compatible with the people's and the government's needs. (469, pp. 51, 52)

What is being proposed in this instance by the AID official is harmonization of objectives.1/ Different agencies, governmental and private organizations, and citizens' groups are frequently involved in project implementation, and they rarely agree on all of a project's objectives, especially if they have had little or no role in formulating those objectives. Project managers and other personnel may be called on to harmonize conflicting objectives, even in a well-designed project, because it is impossible to foresee all contingencies which may arise during implementation. Project designers can learn from the study of such projects as Comilla that both participation in problem identification and objectives formulation, as well as a system for continuous feedback and modification are necessary ingredients for well-designed projects.

As project participants learned to objectify their experience through practice, in PIDER by taking part in drawing up micro-regional plans, and in Daudzai by supplying data for the village surveys, their abilities to set and to reach self-help targets increased. As their new abilities were recognized by project staff, new activities were planned and carried out. Thus, while the objective of self-help may mean little if it remains only a concept, when it is made operational it helps to establish a process of growth and response.

The nature of project objectives, and therefore the resulting activities, depends heavily on who sets the objectives. Foreign donor personnel usually set objectives in terms of production or other changes they desire to see made in terms of outputs. If production is the objective, the primary concerns of the assisting agency become supervision and control to make sure that schedules are met. The donor is tempted to intervene to provide solutions, frameworks, and formulae to get things done. The net effect may be to keep country project officials from developing their own potential and making their own decisions. (469, p. 45) This same outlook may be held by planners, project officials, or others within a country with respect to the ultimate project target group. Where

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1/ See pages III-34 to III-38 for a discussion of this.

the target group is not initially able to set production goals and meet deadlines, delays and frustrations are likely to occur. Project planners and managers need to be aware of the implications of deciding to what degree to orient projects toward production or participation oriented objectives.

Quick production results have been rejected in favor of other objectives in some cases. In the Sudan's Gezira Scheme, deliberate plans were made not to adopt the strategy of relying on landlords and potential entrepreneurs simply because their initiative and resources would be the quickest generator of an increased economic growth rate. The objectives decided on were designed to stop the cornering of benefits by speculators, landowners, and moneylenders and the creation of a rich minority. Rather, the project objectives were geared to improving the quality of life of the mass of the people involved. (450, pp. 2, 3)

This decision faced by the planners of the Gezira Project about whom the project was to benefit is crucial to the selection and refining of project objectives. Drucker has pointed out that if an objective is not clearly set for an area of a project, that area will surely be neglected. Empirical research of a number of projects indicates that the better off farmers and producers fare better in the development process than the "have nots," unless a distributional or equity objective is clearly stated for the project. (417, pp. 50, 51)

The Comilla Program, widely regarded as one of the most successful undertaken, was begun after several years of experimentation and systematic study of local circumstances. The objectives chosen resulted in an emphasis on making the governmental agencies at the national level capable of serving the villagers in an effective manner. This was an example of selecting specific objectives which, when added together, could lead to accomplishment of more general goals. Significant problems have occurred when individual objectives were chosen which did not agree with larger goals. Planning ministries and line ministries have sometimes succeeded in meeting the objectives of individual projects, only to fall short of meeting sector or area goals.

2. <u>The Project Team</u>

Much has been written about the special qualities needed by project team members. Desirable characteristics of project managers have been described to include technical competence, flexibility, entrepreneurial behavior, unifying capability, ability to balance off claims of competing interests, knowledge of how to work through (or around) organizations, and many other factors. Doubtless it would be pleasant to be able to locate individuals who have most of the desirable characteristics of such a shopping list. The hard fact remains that few such individuals are likely to be availalbe, and that projects must continue to be staffed with the talent that is available.

The task of a project is to provide the best possible solution(s) to the problems which the project has been designed to confront and solve. (240, p. 13) The composition of a project team, therefore, depends in great part on the nature of the problem being dealt with. Research and experimental projects in practice have had a different team composition in many cases than demonstration and production projects. Similarly, problem-solving projects have differed in team makeup from inputs or services delivery projects.

The planners of the Comilla Rural Development Academy believed that technological change in agriculture was important to the development of Comilla's communities. Based on this, they might have decided that a staff of technically well-trained extension agents should form the core of project staffs to implement the projects. They chose a different approach, however, which considered not only technical, but social and political variables. They chose to staff the academy primarily with nontechnical people, defining ten faculty positions in terms of problems of rural areas, such as "rural business management," "cooperatives," and similar categories. They began to look for social science-based solutions to rural problems. (275, p. 673) Their approach was grounded on a careful analysis of the project area, which convinced the Academy planners that technological changes would have to be made through cooperative group activities, rather than through the actions of individuals or single families. It was assumed that the productive capacity of peasants could be quickly increased through cooperation, and farming methods could be gradually modernized. Irrigation, for example, would have been extremely difficult without collective action. As Khan has noted:

> "A two-cusec lift pump or tube well served one hundred acres cultivated by fifty or more owners. The installation of the machine, the construction of field channels, the distribution of water, the collection of costs, all depended on concensus. Individually a two-acre farmer could neither buy nor operate a pump or a tractor. The cooperative could introduce joint management." (497, p. 16)

The assumptions on which the Comilla procedures were based deeply affected the type of project staff which was selected. Each farmer cooperative group appointed a manager who met weekly with experts both from the Comilla Academy staff and from governmental agencies to discuss problems of his group and how they could be overcome. The managers themselves were peasants. A primary task of the staff was to communicate with peasants and to provide assistance appropriate to the solution of the peasants' problems. A required ability of the staff was for clear communication of both information and skills. But the Comilla staff did not have this skill equally at the outset. Rather, the project structure and processes allowed for learning and continual improvement of communications skills through interaction. The skills of the project staff and the villagers developed together, and the assumption that the villagers, if given a chance, can rise to leadership, was proven on many occasions. (493, p. 27)

The Thana Training and Development Centers at Comilla emphasized the need for very close coordination between the "nation-building departments" and the institutions and leaders of local government. All services, supplies, and experts were to be located in the Thana Centers for the sake of the people in the project area. More rooms were to be built as new services were needed. (497, pp. 22, 23) This service theme of the project illustrates another responsibility of the Comilla project staff. That is, to act as a bridge between the people whom the projects were designed to serve and experts located in government agencies. Some people are more skilled than others, it must be admitted, at getting cooperation from government agencies. Most rural development, and many services or inputs delivery projects cut across organizational lines, however, so the ability to get interagency cooperation is widely applicable and useful. Like the skill of communication involved in training, however, it is difficult to test for, and there is little chance that project team members could be recruited on the basis of some characteristics of "good coordinative abilities" which could be identified in advance. An analysis of an applicant's experience could be helpful, but would certainly be no guarantee.

Project management requires a suitable organization for the careful and efficient execution of project plans. The organization at Comilla achieved a lot, but it also cost a lot. Partly because some of the projects were pilot efforts, considerable supervision was required. While some drop in costs per unit of activity could be expected as more local people receive training, the expansion of a high-participation approach has often entailed high short-run absolute costs. (50, p. 14) If the objective is to reach an end point where local people are responsible for their own development, however, initially high staff costs must be weighed against the eventual gains of self-reinforcing development planned and run by the local people.

The Kenya Smallholder Tea Project operated by the Kenya Tea Development Authority (KTDA) faced the need to establish a project team which differed considerably from that which was appropriate in Comilla. As an input/services delivery project, KTDA was responsible for raising external loans, control of timing and areas for tea planting, establishing factories and making arrangements with private companies to process tea, training and supervising growers, maintaining records, collecting and transporting tea leaves, and other production and service requirements.

KTDA as it was established in 1964 was properly called an "Authority" because of its near-paternalistic relations with smallholders. Once the smallholder decided to grow tea, he was tied to the procedures and services as prescribed by the KTDA. But KTDA provided an efficiently run organization and a high-caliber extension staff which produced results. In its first twelve years of operation, KTDA's area of supervision went from 3,660 to 61,352 acres and the number of smallholders increased from 9,062 to 66,500.

Basic to KTDA operations, for all its authoritarian qualities, was the notion of interdependence. KTDA's ability to meet its yearly payments depended upon maintaining a strong incentive for growers so that they would produce a high annual output. KTDA also had to enjoy cooperation with other ministries of the Government of Kenya while keeping itself free from unnecessary interference and running its own show. KTDA was thus organized with the assumption that interdependence would be necessary. A good information flow was established between headquarters and the local areas, through a broadly-based, efficient local structure established by KTDA.

The objectives and assumptions about the way KTDA would have to operate affected the way it was organized and staffed. Junior Agricultural Assistants (JAA) became the main (often the only) contact with the smallholder. These front line extension agents started with only a minimum base of technical knowledge, then were trained in the special technology of tea cultivation in order to train and supervise smallholders. On the average, the JAA made five visits annually to each smallholder, providing specialized assistance at different stages of tea growth and harvesting.

An efficient supervisory system was essential to maintain the good communications between field and headquarters characteristic of KTDA. The staff hierarchy was established to provide efficient supervision and adherence to schedule. One JAA served approximately 120 smallholders, and one Agricultural Assistant (AA) supervised four JAAs. Both AAs and JAAs received four weeks of training in tea cultivation and extension methods. AAs and JAAs were supervised in turn, by Assistant Tea Officers, Tea Officers, and Senior Tea Officers. Tea Officers were in charge of all field development operations for a district, with the aid of Assistant Tea Officers in the larger districts. Two Senior Tea Officers each oversee roughly half of the entire area of operations.1/ All of KTDA's staff was seconded from the Ministry of Agriculture, facilitating interactions with the Ministry. KTDA, however, is an independent authority with its own financing which has been able to avoid much of the red tape faced in regular ministries. Completion of multiple forms and long waiting periods for processing field requests have largely been done away with.

Projects which are in the production stages or which are basically services or inputs delivery projects, such as the Kenya Smallholder Tea Project, have operated very successfully with an hierarchical structure similar to that found in small programs. It is in fact difficult to distinguish between KTDA operations and the way some programs are structured and implemented. The basic difference appears to be that the objectives of KTDA were well defined both as to area and desired outputs. The combination of

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1/ See chapter 16, "Monitoring, Reporting, and Control," for a discussion of the communications and control system used by KTDA.

clear objectives and outputs and a relatively high degree of operational freedom from bureaucratic restraints allowed KTDA to operate more effectively than most government ministries. Once the objectives, targets, and general operational plan were outlined, and general work standards developed, it was possible to state requirements for the people who would be needed to staff the project. The staff members were designated to fill concrete, well-defined roles, and not chosen according to some abstract concept of leadership.

At Comilla, a more collegial style of staff operation was necessary for the problem-solving and teaching that were necessary there. This open-ended, inquiring style is common to experimental and pilot projects. The project director or manager at this stage had to be a man who could guide others in research and experimentation without imposing a heavy authority which might stifle innovation and learning.

It has been contended by some that project managers should be appointed for the life of a project to insure overall continuity to all of the project's phases, including ex post evaluation. (385, p. 5) Such a proposition should be investigated in light of the project's objectives, its length, and other characteristics. The objective of a research project, for example to develop an effective rat poison, as in Taiwan, and the successful application of that poison in a demonstration project may well have called for personal abilities that differed considerably. What is essential, however, is that there be a continuous locus of authority as a project develops. While this has most often been a project manager or director, some success has also been achieved with project management teams. Whether an individual or a team is used, authority over inputs and a budget to insure their availability has proven to be essential. (75, p. 15)

The project manager is the nerve center of the project during implementation, though he or she may not be directly involved with some of the project's activity. The first requirement for the project is that everyone concerned must know exactly what it is. (382, p. 31) A primary continuing responsibility of the manager is to keep the staff informed and aware of the project objective and proposed inputs and outputs and what their role is in making the project work. In a problem-solving project, this may mean that the manager joins in a collegial effort to continually define more clearly the nature of the problem and how it may be solved. It may mean the assignment of staff members to task forces with defined areas of investigation. In some cases, it may mean that the general expertise of the field staff must be complemented by that of experts in various fields. One responsibility of project management in this case is to establish relations with experts in research, administration, technical fields, and other areas as appropriate. These may be experts from ministries or technical institutes from within the country, from donor or lending agencies, or private organizations abroad. (464, p. 13) When the services of outsiders are necessary, it is the responsibility of project management to

arrange for local people to be trained to take their places whenever possible. (538, p. 27) It has been observed that farmers do not turn overnight into expert business managers; even project staff might require some extended training. (417, p. 332) This is all the more reason that the training should be begun promptly.1/

In Mexico's Puebla Project, four months were spent in the search for a qualified Project Coordinator. Upon joining the Project, the Coordinator conducted a general reconnaissance of the Project area, visiting farmers and observing their technology for maize production. He talked with farmers about their production practices, yields, relationships with agricultural institutions, and their interest in taking part in the proposed Project. The Coordinator's questions made it clear that more detailed information on the farmers' attitudes, production technology, and other areas was needed, and a socioeconomic survey was added as a component of the Project. This indicates that even in projects which are well planned all contingencies cannot be foreseen. Fortunately, the Project Coordinator had the capability of authorizing additional project components. (271, p. 11) This ability to respond to local conditions has proven to be a most significant factor for success both in Puebla and in other projects.

One of the most critical periods in the development of the Puebla Project came in 1969, with the task of coordinating participating organizations to insure that fertilizers were delivered to farmers when they were needed. Fertilizers had to be ordered early, freight cars made available, distributors had to receive and tranship to sub-distributors, and farmers had to have credit in order to pick up the fertilizer when it arrived. Continuous contact by the Coordinator with all involved institutions was necessary at all points in the chain of events so that the personnel of each institution understood clearly what was required of them. (271, p. 14)

Frequently, in cases such as this, one agency or organization has had the responsibility for formulating a project which has been subsequently implemented in part by other agencies. In such cases, it has proved valuable to involve the implementing agency in project formulation. Some organizations have appointed a project manager who was involved both in formulation and implementation. There is no doubt that the fuller dimensions of the project are better understood by the project manager when this is done. (503, p. 78) In another Mexican project, the preparation and subsequent execution of plans for the PIDER Project served as a catalyst to involve agencies in concentraing their existing and planned programs on selected micro-regions. The PIDER managers were careful to elicit the participation during the planning stages of agencies, organizations,

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1/ See chapter 15, "Consultancy" for a fuller discussion of this issue.

and elected officials who were to be involved in implementation. The PIDER approach is both integrated and decentralized, and its application on such a large scale is in itself an innovation. Before PIDER, a variety of agencies working in rural development had each developed its own criteria for selecting target regions, and its own programs for dealing with problems in those regions. Under PIDER, there is much closer liaison in both planning and execution of programs. For example, two separate agencies now coordinate the timing of irrigation and electrification so that when pumps are installed there is no long wait for wiring. The efficiency of services has therefore been greatly increased. In effect, the concept of the "project team" has been extended to embrace key people in a wide range of organizations.

The Puebla and PIDER examples indicate some of the abilities required either of the project director or of the project team. On the technical side, there is the need to schedule project activities to insure smooth delivery of supplies and the coordination of various ministries, agencies, and private organizations. While such activities may be superficially plotted during the planning stage, on-site experience during implementation is required to modify work plans in order to keep abreast of changing conditions. Further, a technical capability in project scheduling and planning techniques is not sufficient. The decision by the newly-appointed Coordinator in Puebla to add a socioeconomic survey to the Project derived from his personal site analysis of the Project area. His comparison of the overall Project plan with the evidence of his own efforts revealed to his experienced eye a shortcoming in the Project blueprint. His further close personal contact with institutions during the period of fertilizer delivery showed his awareness that one cannot rely completely on pre-set plans, even when those plans were known and agreed to by participating institutions in advance. The Coordinator in this case served as an on-site trouble-shooter. Obviously, this would not be the correct role for the project director to play in all cases. Many, in fact most trouble-shooting actions must be delegated to leave the director free to assess overall operations, to develop project policy and secure the favorable attitude and support of participating organizations. But the project managers in some of the most successful projects have shown a willingness to do more than to direct benignly from afar. When direct observation and action have been necessary, they have willingly participated in whatever task was necessary to move the project forward. One aspect of successful leadership by project managers has clearly been the willingness and ability to serve by personal example.

An important externally-oriented task of project management is to keep higher-level managers informed of project progress and problems. In the Comilla Program, for example, considerable effort was devoted to the preparation of periodic progress reports, which were distributed to superior departmental officials in the capitol. The Director kept responsible bureaucratic senior officials informed so that they could properly evaluate progress and consider expanding projects into regular programs under departmental sponsorship.1/

1/ See chapter 16, "Monitoring, Reporting, and Control" for examples of reporting systems.

(275, pp. 674, 675) Experience in other countries has also proven the need to keep people at higher levels informed. It has been observed that in India, the upper echelons have little chance to be in first-hand contact with field situations. The only effective and continuing channel was with middle or lower-level personnel whom the higher level officers know intimately. In the absence of a continuing reliable source of information from the field, the higher managers had no basis for making realistic decisions about projects. Another effect noted in India was the cumulative frustration of talented middle-level managers who had no way of conveying information to higher-ups about their progress and problems. (551, p. 198) U.S. A.I.D. officials have voiced a concern that in other countries there is also a need for both political executives and top administrators including ministers, the heads of planning and budget offices, directors general of major bureaus, and others, "to appreciate the analytic and decision-making process essential to sound project formulation, approval, and implementation." (425, p. 58)

In the process of selecting a Director for Kenya's Special Rural Development Program (SRDP), a vigorous debate was generated about the "leadership qualities" which should be sought. Many people felt that the Director would have to be someone who could command the respect of all -- peasantry, politicians, and departmental officers. This controversy highlights another requirement for project leaders which has proven to be critical, namely, the ability to mobilize people's efforts for development, a significant factor in such projects as Comilla and Puebla. In Malawi, the Shire Valley Project has had a general impact in its first phase which is difficult to quantify, in mobilizing people in the project area who were resistant to change to improve health standards. Further, it has improved the efficiency of Malawian administration and has led to the establishment of a grass roots system for rural development. There is of course no intent to imply that the success of the Shire Valley Project, or of any of the other projects discussed, comes entirely from the project directors. Sound planning, clear objectives and targets, well-detailed and properly communicated guidelines are extremely important to project success. Nonetheless, project managers should consider the roles played by managers of successful projects in inter and intra-agency coordination and in motivating both staff and the people of the project area; in continually providing guidance and reaffirmation of the worth of people's efforts, in addition to the technical skills which are often emphasized more strongly. The story related by one U.S. A.I.D. official of a project in Ecuador makes this point well. When the official accompanied the A.I.D. Mission Project Manager, one of the Ecuadorians told the A.I.D. Project Manager that he was visiting the project too often: it was the Ecuadorians' project. They eventually developed an institute for training as a result of the project. The Ecuadorian's comment was in fact a compliment to the motivation and leadership development brought about by the A.I.D. Manager's efforts. (552, pp. 53, 54)

3. Organization and Process

The choice of an organization to implement a project and the development of guidelines and procedures for running the project have often proven to be critical factors in meeting project objectives. Even when projects are otherwise technically well-prepared, they are not likely to meet expectations when insufficient attention has been given to management and organizational issues. (542, p. 343) Organizational and managerial aspects should be analyzed early in the project cycle, certainly not later than the time of project formulation, to permit evaluation of alternative arrangements, and to allow preparatory steps to begin so that the project will not be delayed on this account once implementation begins. (503, p. 78) Some of the questions that have to be answered include whether a project will be implemented by an existing government agency, by a new agency, or by non-governmental agents (contractors, voluntary organizations, or others); what will be the role of local people and groups in the project area; and, what role local governmental organizations and officials can play in implementing or supporting the project.

If an existing agency or organization is to be used, it must be determined whether reforms or administrative changes are necessary to increase the chances of success. If a new agency is to operate the project, it must be decided what kind of organization will be established, where it will be housed, from whence it will get the required personnel, and what kinds of training will be necessary. (503, p. 77) Further, because development is a field that is rife with uncertainties, sufficient flexibility must be built into organizational structure and processes to allow adaptation to changing conditions which experience shows are sure to occur during implementation. While there is no doubt that the initial design of a project is important, ex-post project evaluations have indicated repeatedly that, "building a development project is never a self-executing or self-fulfilling process." (546, p. 65) Uncertainties and contingencies, human and technological inadequacies, and competing interests must continually be dealt with. Analyses of World Bank projects have noted that success can depend much more upon the rate at which project executing agencies develop the capacity to implement field projects than upon the initial design of the project.

In practice, there is seldom total freedom in the choice of a project implementation organization, and by and large, project choices have been limited to one of the following areas: 1) expansion of existing bureaucracies; 2) creation of an autonomous or semiautonomous organization; 3) establishment of a project organization reporting to the center; 4) establishment of an organization reporting to field or regional agencies; and, 5) contracting for services or relying on an external agent. (Adapted from 503, p. 82) In addition, some projects use a combination of

some of these five basic approaches. The organizational arrangement chosen depends on the characteristics and objectives of the project, the existing organizational machinery in the country, and the extent to which a new organization can be made viable.

a. Expansion of Existing Bureaucracies

The latitude of choice in selecting an organization varies considerably from country to country and even in some cases from ministry to ministry in countries. In India it has been traditional for projects included within the Five-Year Plans to be executed by the responsible bureaucratic organization (expansion of bureaucratic functions). Because different projects are administered at different levels, i.e. national, state, district, block, and village, and because more than one department is often involved in project implementation, both vertical and horizontal coordination are necessary. If an existing organization is chosen, the maintenance of such coordination between various levels and departments depends largely on prevailing administrative structures and procedures, and on the caliber of available personnel. A consideration in choosing an organization for implementation in the case of India is to know how far Indian administrative structures and procedures facilitate or hinder coordination, and which organizations and different hierarchical levels may be expected to cooperate to get a project implemented. (65, pp. 107, 108)

One problem sometimes faced in choosing an existing bureaucratic structure to execute projects is the fragmenting of tasks. In spite of supposedly rational organization, in practice bureaucratic communication is often deficient. In India's agricultural structure directives move from the higher to the lower units in the hierarchy, but the flow of information in the reverse direction is not equally well provided for. Within the bureaucracy, status structure is a strong barrier to the flow of information from the lower to the higher levels.

A common technique for achieving multi-sectoral coordination when an activity involves more than one ministry is to establish inter-ministerial committees. A difficulty with this is that representatives of a ministry act only after close consultation with the head of their organization. Such arrangements tend to be unwieldly and slow. In India, the execution of the Upper Silero hydroelectric project remained delayed a number of years because of interstate conflict as to the choice of the site and confusion as to which ministries and state organizations had the authority to decide. (65, p. 106)

Inter-ministerial coordinating committees have been more successful when given project responsibility and authority over the budgetary allocations. In the Philippines during the years

1966-1969, the effectiveness of the leadership of the central coordinating committee has been related to the executive secretary's control over the budget of the cooperating agencies and the authority over the Budget Commissioner delegated to him by President Marcos. (505, p. 16) In Israel also, the experience was similar. The success of the Lakhish project was determined to some extent by the budgetary authority exercised by the project team. (556, pp. 15, 16)

Where activities are constrained by time limits, coordination may be speeded by more frequent meetings among department heads. But even in instances where there is a need for continued coordination, department heads, for lack of time, sometimes delegate the task of coordination to an assistant or other subordinate who attends interdepartmental meetings. Such subordinates generally have to refer to their respective department heads before making a decision. Although one may assume that the designated subordinate is acting for the department, his discretionary authority is usually limited. While the climate among departments and ministries varies, a common relationship among bureaucratic departments is a competitive one, so that instead of dealing with actual problems, jockeying for personal and organizational position or status considerations often dominate decision making. (554, p. 659)

There is much to suggest that the assignment of project responsibility to an existing part of the bureaucracy will not be effective unless modifications to the normal processes of the bureaucracy can be made. The Cáqueza Project, one of six rural development projects carved out by the Colombian Agricultural Institute (ICA), achieved considerable success by demonstrating that net income increases of 50 percent were possible on the average farm in the project area. One objective of the Cáqueza Project was to determine effective ways of working with small farmers, and while some problems remain to be resolved, the methods developed may be replicable on a much wider basis. Even the limited successes gained at Cáqueza did not come without a struggle, however, and long and difficult battles between regional and national offices have been reported. (63, Annex H)

A basic factor in the successes achieved at Cáqueza relates to the degree to which the project was regarded as a special, non-routine activity. Basing some aspects of their approach on the lessons learned from Puebla, the project staff enlisted the support of municipal leaders, and helped to organize councils of farmers, clergy, businessmen, and local leaders. "Natural leaders" from among the farmers led local meetings and provided a transmission line between project staff and the rest of the farmers. This distinctly unbureaucratic approach seems to have provided the basis for much of the project's gains. In addition, as the farmers' perceptions of constraints and profits were recognized by the project staff as a major factor in acceptance

or rejection, further organizational changes emphasizing decentralization of services were made. In short, while the project remained under the existing bureaucracy, it was provided a more separate and special status which allowed it to function more effectively.

While some degree of change in existing organizations thus seems appropriate in most cases, the scale and pace of change is also a factor affecting implementation. It has been observed that where the amount (scale) of change is too demanding, or where the rate of change called for is too fast, institutions are unable to respond. An evaluation of one donor-sponsored project in Africa concluded that the number of things that can push a project off course is partly a function of the new institutional relationships upon which implementation is dependent. In this case, the project called for the creation and operation of a new division in the ministry of agriculture, a new approach to small scale lending, increased demands on the land registry staff, a reorientation of extension strategy, and a consequent increase in extension staff responsibilities and workload. In view of the tremendous load this placed on the ministry, a full response was impossible. Those engaged in project design bear a responsibility not to endanger project objectives by overloading requirements beyond the bounds of reality.

In addition to jealousy among ministries or departments, or conflicts of jurisdiction which may arise on an overall basis, problems have sometimes arisen in integrating the efforts of different organizations at the level of the land area covered by the project itself. This has led some experts to conclude that where possible, the land area of the project should coincide with the area of an established administrative unit of government, thus providing a common governmental integrating point. (555, p. 7) This, of course, may conflict with other criteria such as natural or functional zones which form the base area for some projects. Both criteria need to be analyzed and insofar as possible reconciled if integration of administrative efforts of several governmental organizations proves to be a problem. Even if the project area and the administrative unit of government are congruent, there may be problems of coordination of local and national efforts. (555, p. 7) One approach to this problem developed in Mexico's PIDER Project is discussed below.

Serious problems have been encountered in some cases when projects were assigned to existing ministries, and the foregoing caveats should be kept in mind. The key to success illustrated by the Cáqueza projects in Colombia was to effect the necessary changes in the bureaucracy to allow the project objectives to be met, but to stop short of sweeping changes and reforms which had little or nothing to do with accomplishment of project objectives. Other projects have also borne out the need for such changes.

The changes made in Kenya's Special Rural Development Program (SRDP) have allowed a continuing injection of new ideas into this ongoing program which have influenced the type of projects undertaken and the way they were designed and implemented. Beginning with the assumption that the administrative capacity of the SRDP was greatly underutilized, and the belief that the entire organization could be strengthened if the field staff was called on -- and allowed to -- do more, a reform objective was arrived at which required some specific changes in organizational process. Specifically, joint programming, in which all those responsible for implementation contributed their ideas and knowledge in the original planning and the revision of projects, was adopted and placed under the direction of the SRDP Area Coordinators. (462, p. 155) The process of joint programming placed implementation responsibilities more fully on field personnel, who, as they became more involved in setting and attaining objectives, called for support when it was needed from headquarters. Before joint programming, objectives and targets were set at high levels and transmitted downward. The effect of joint programming was to establish a continuing communication upward, reversing the normal bureaucratic flow which emphasizes top-down orders about what should be done and how to do it.1/ Joint programming, area planning, and delegation of authority to Area Coordinators which allowed them to operate more effectively had the net effect of introducing far reaching changes, though structural organizational changes were minimal. The SRDP experience is yet another case of large gains made by the release of human potential.

b. Creation of an Autonomous Unit

A second alternative which has often been used is to create autonomous unit to carry out projects. The World Bank has at times favored the creation of autonomous units for the management of projects to which the Bank has been a major contributor. Maladministration and lack of capability of existing organizations, the desire to safeguard the lending organization's capital, and the need to offer pay rates higher than prevailing or civil service scales have been cited as reasons.

When projects have been assigned to new special units or to autonomous organizations, steps have been required to build up the new organization, to develop operating procedures, and to recruit and hire new people. (503, p. 83) Because the pool of trained people which can be drawn upon in most developing countries is fairly limited, the establishment of new project

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1/ Orders, of course, can never flow from a lower to a higher level. One of the functions of bottom-up communication is to state what is needed to achieve objectives, and the consequences of not meeting them. Apparently the SRDP upward communications performed this function.

organizations has at times had the effect of withdrawing qualified personnel from existing agencies or programs. This is similar to the problem faced by Tanzania when it established its Rural Settlement Commission (which in 1963 was renamed the Village Settlement Agency). The Agency required staff with graduate training, and took staff from existing governmental agencies, particularly the Ministry of Agriculture, where large gaps were created. To minimize the chances of this kind of occurrence, when projects are listed roughly in terms of priority, human resources should be analyzed in the same manner as financial resources, and forethought given to the source from which personnel will be drawn, especially for large scale projects.1/ One way of carrying out such an analysis is illustrated in the diagram on page XI-49 which relates given factors in a project, existing factors which require modification, and new inputs and outputs which are necessary to install the project and put it into operation.2/

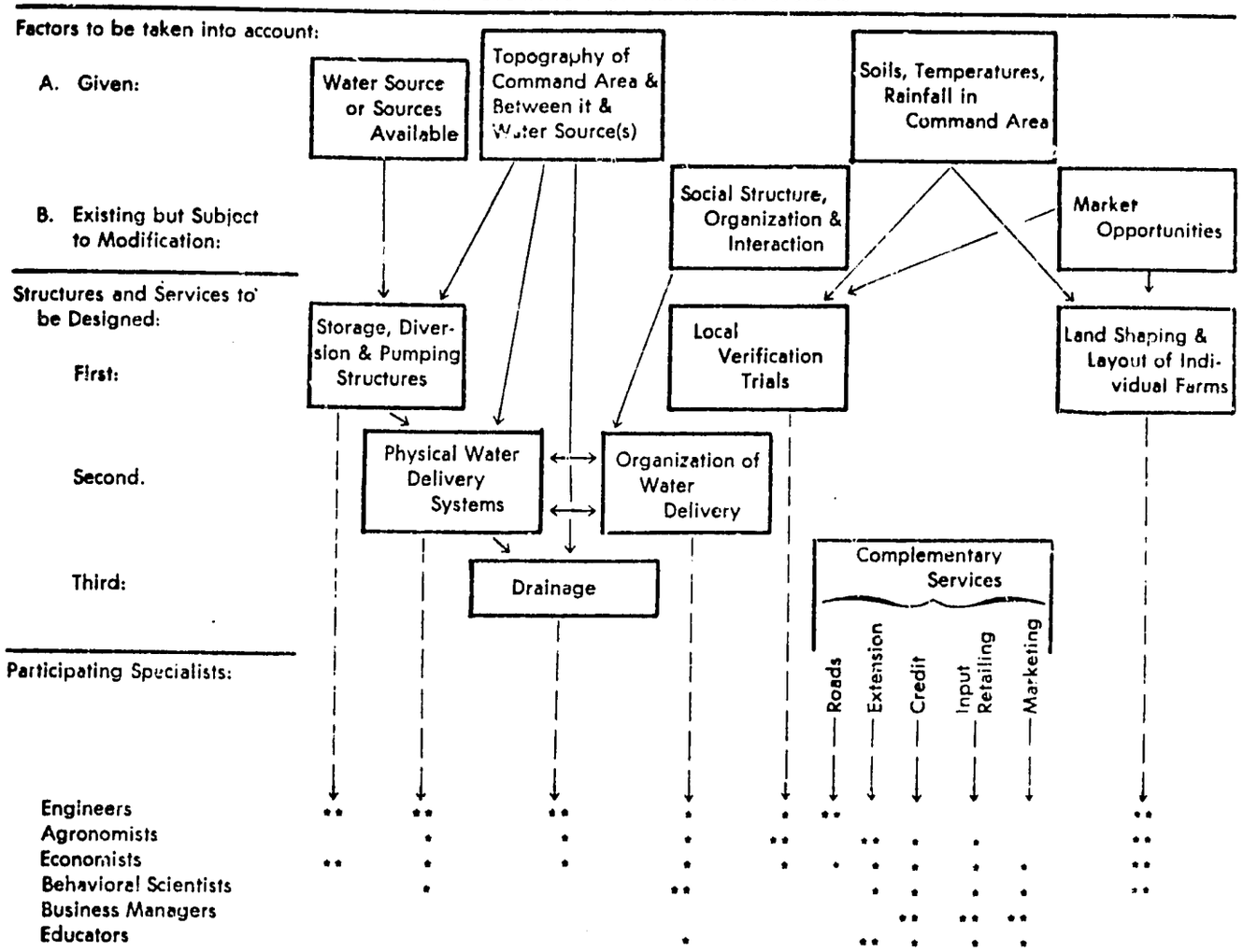
Circumstances favor an autonomous agency when the regular organization -- in many cases the Ministry of Agriculture -- lacks competency and it appears impossible to build it up sufficiently to meet the objectives of an urgently needed project; where the project is very large in comparison to the regular organization, or where the project is considered unsuitable for the regular organization. One kind of project which is often not suited for existing organizations is the problem-solving project, especially at the experimental and pilot stages during which flexibility and the ability to respond quickly to local conditions may be beyond the capability of the regular organization. Land reform projects and programs have also often been set up as autonomous units to avoid bringing controversy to the regular program or project which would disrupt its activities.

In 1970, Bolivia's Rural Development Program was split away from the Ministry of Agriculture, renamed the National Community Development Service (NCDS), and transformed into an autonomous agency. In this case, the activity became too big, as it became successful, to remain a dependency of the Department of Agriculture. (63, p. G26) The NCDS subsequently has enjoyed considerable growth and success and has more requests for assistance than it can fulfill. Thus far, there are no signs of its having become rigid and unable to respond with projects designed to meet the specific needs of its largely peasant constituency. Interested communities file formal written requests, which NCDS responds to when local contributions and self-help are proven to be available and a plan for the proposed project has been approved. (63, p. G28)

1/ See chapter 13, "Organization," for further discussion of this problem

2/ This is a modification of a Work Breakdown Structure discussed in Annex E. "Project Work Scheduling and Review."

ROLES OF SPECIALISTS FROM DIFFERENT DISCIPLINES IN THE DESIGN AND OPERATION OF IRRIGATION SYSTEMS



* Denotes supplementary responsibility
** Denotes major responsibility

(558, p.12)

In Ecuador, a World Bank supported project was administered by an independent Project Commission made up of representatives from the National Planning Office, the Ministry of Agriculture, the Central Bank, the Coastal Cattlemen's Association, and participating local banks. The intent was to involve actively these organizations, as well as leading individuals from the public and private sectors, and so to gain the full support of all participants, rather than to place the Project within one ministry, and thus possibly arouse jealousies which would impede implementation. This project was also one of the first in which the Bank encouraged considerable local involvement in formulation and preparation, with the hope that the Ecuadorian staff would participate more fully in implementation as well as develop greater capacity to plan and carry out future projects. This

tactic has paid off, as Ecuadorians trained on this project have played responsible roles in preparing and directing later projects.

c. Project Organization Reporting to a Central Authority

Projects involving large-scale action involving several or many organizations, or which operate in different political jurisdictions, have in some cases been successfully administered by organizations which report directly to a central authority which is sufficiently strong to resolve disputes and set policy which will be recognized as authoritative by all participants.1/

The PIDER Project in Mexico involves numerous political jurisdictions, governmental organizations, and private firms and individuals in rural development activities on an extensive scale. Authority to implement and to provide continuing coordination for the Project is given to the Ministry of the Presidency (Presidencia). This differs greatly from earlier Mexican practice, when each ministry operated its allotted budget independently, with little coordination. PIDER is organized at the federal, state, and village levels. At the federal level a coordination committee is made up of senior officials from participating agencies. The committee's work is aided by a permanent technical working group composed of representatives of the agencies, as well as by a permanent technical staff assigned to the Presidencia. State level committees are made up of representatives of participating state agencies and chaired by the Governor of each state. A working staff performs continuing tasks for the Committee. At the village/community level, local authorities comprise boards which insure that local needs and objectives are considered and that local participation can proceed effectively.

This tripartite arrangement seems to be working satisfactorily, and is proceeding with minor changes for which experience dictates the need. A flow of communications has been effectively established, with policy guidelines from the Presidencia disseminated both to the federal ministries and organizations, and downward to the state and local levels. At the same time, local needs vary greatly among localities, and the local committees enable adjustments to be made in the types of sub-projects and services delivered according to specific local needs.

1/ This does not imply that fiat is a sufficient means of assuring implementation, but rather that an authoritative point for the issuance of guidance, instructions, and policies has been found to be one necessary ingredient for successful implementation.

An important key to PIDER's success has been the location of coordinative authority in the Presidencia, in effect a super-ministry which has the final say on allocations for public investment. In many cases in which authority was assigned to a ministry at the same level as other organizations requiring coordination, the participating agencies have been able to exercise a de facto veto, a problem which has not arisen in PIDER.

d. Project Organization Reporting to a Regional or Field Agency

Where project decisions cannot be made by people who are physically close to the problems which must be dealt with, and familiar in detail with the substantive nature of the project, frequent delays in implementation have often proved to be a continuing impediment. Such delays have often also been evident in heavily layered organizations, in which numerous clearances from upper levels must precede even relatively routine implementation actions in many instances. Some countries have tried to improve effectiveness by establishing project organizations at the regional or field level, which report to a decentralized authority there. One example of this was the Lakhish Project in Israel.

The Lakhish Regional Development Plan was successfully implemented in large measure because of the special administrative and organizational framework established for it. First, a special interdisciplinary team was formed by recruiting architects, engineers, agronomists, economists, sociologists, and administrators from existing organizations. The team reported to, and worked within the general administrative framework of, Israel's Settlement Authority. The Settlement Authority, though nominally a central office, is highly decentralized, with planning and implementation carried out in regional offices, where the interdisciplinary teams live and work together. The regional team cooperates closely with local farmers' organizations and coordinates development activities with the various governmental departments at the regional and local levels. (556, p. 9) The Lakhish regional team, like other teams operated by the Settlement Authority, was given authority and budgetary means to adjust plans during implementation as local conditions changed. Long delays to obtain clearances from distant central offices were not necessary, and this speeded implementation considerably. The settlement area was given the status of an independent administrative region. The team members remained in close touch with incoming settlers, and were "on the spot" to handle problems as they arose. (556, pp. 15, 16)

Regional development plans or schemes such as the Lakhish plan usually cut across sectors and aim to improve the overall development of a region. While they are called projects, they are often in fact a cluster of projects which mutually reinforce each other. Such comprehensive rural regional projects include PIDER, CADU, and in Malawi, the Lilongwe and Karonga Projects. The overall time needed to implement such projects is often long,

though they may be planned so that sub-units (or individual projects within the comprehensive or cluster project) may come to maturity in stages. One advantage of such a strategy is that local people can see the benefits of some investments in a relatively short period of time. (557, pp. 24, 25) Another advantage is that some part of the earlier gains may be used to finance later undertakings. Finally, such a strategy is consistent with the finding that organizational change has been more effective in most cases when introduced gradually.

The problem of finding an adequate number of trained technicians and managers to implement projects has already been mentioned in connection with the creation of autonomous and semi-autonomous organizations for project implementation. It has usually been a lesser problem, but still a serious one, in implementing projects in which the organizations report to the center or to a regional agency. Most of the projects which have been successful in these categories have called for secondment of personnel from existing organizations, sometimes weakening the conduct of ongoing programs. The phasing of projects units in regional projects is one way of alleviating the demand for trained project personnel at any given point in time.

Another approach keyed to regional development based on administrative divisions is the thana development program in Bangladesh. While the projects developed in Comilla thana are still the best known, Thana Training and Development Centers (TTDC's) were in fact formed in each of the country's thanas in the early 1960's. Thanas, roughly equal to counties or districts, are local institutions for rural development, and they provide an administrative and organizational framework for the operation of projects. The Thana Circle Officer coordinates the activities of central Ministry officials posted to the thana, and oversees their interaction with elected Union Councils, which formulate development policy for each thana. Citizens and elected cooperatives officials can gain access to twelve to fifteen government ministries in the Thana Center without having to make long trips away from home. (392, pp. 70, 71)

e. Use of an External Agent

Experience shows that agricultural services are contracted to external firms and organizations for a number of reasons. First, the contracting firm can provide a source of skills and expertise which is often not readily available in a client organization. (435, pp. 1, 2) Moreover, contracting firms are ordinarily available quickly. Secondly, because consultants repeatedly work on problems which may not routinely confront a given organization, they develop and maintain valuable analytical skills which may be uncommon in some countries. (436, p. 17) Third, although the costs for contracted services may appear to be high when considered in isolation, when considered in view of the planned for results, such costs may be moderate. Fourth,

the service -- particularly that of an external consulting firm -- may provide an objectivity which cannot be found inside the organization. An impartial viewpoint, free of pre-set lines of commitment, may in itself be a valuable service.

The use of contractors makes it possible for the bureaucratic organization to tackle a great variety of tasks in pursuance of its objectives on a flexible basis. This is particularly advantageous where the need is intermittent since it avoids staffing for a temporary need. Execution through a contracting firm makes it possible to get the best available talents. Many times the use of contractors is insisted on by cautious lenders of project funds. The use of contractors gives greater assurance that the resources allocated will be used for the designated activity rather than the assigned to continuing functions. Where salary levels and conditions of service of government agencies are particularly poor, contracting out services may be the only feasible way of getting the job done in the short run.

Contracting for services, however, has a number of disadvantages. First, experience in doing the job seldom remains with the organization. Nor is the contracting firm likely to consider training for operational management an especially high priority task. Second, where an activity has multi-disciplinary content, it is difficult for the bureaucratic organization to monitor contracting services. There is sometimes a strong tendency for the aspects of one discipline to be over-emphasized to the exclusion of other aspects. Thus, if irrigation works are contracted out, in some cases it has become the responsibility of the engineeging department, with little consideration or coordination with related activities.

Contractors and other agency personnel should generally be used sparingly and with discretion. While their use in many countries will continue to be necessary in the short run, and while certain tasks will coninue to be performed by specialists from external sources for some time to come, the objective should be to develop capacity within the country, and to a greater degree than exists at present within the major ministires and other agencies primarily responsible for agriculture and rural development. An evaluation of completed projects over a fairly extended period, at least ten years, would reveal what sources of expertise have had to be gotten from external sources. Those which have consistently been necessary for project identification, preparation, implementation, and review should provide a clue to those continuing needs a country will have. This information can be used to determine, in part, the emphasis for training personnel within the country to gradually take over the tasks previously performed by outsiders.1/

1/ See chapter 15, "Consultancy Services."

4. Project Evaluation

There are two general types of evaluation. First, there are audits or evaluations conducted to insure accountability for resources. These evaluations are normally conducted by an organizational unit which is independent from line management. The objective of such audits is usually fairly confined: to determine whether project funds and materiel were used appropriately, i.e., in accordance with prevailing regulations. These evaluations are not the subject of this section.

The other general type of evaluation embodies what the World Bank refers to as a "learning dimension." The purpose of this type of evaluation is to determine what went well, and why; what went poorly, and why; and how future efforts can be improved on the basis of the knowledge gained. The primary purpose for project evaluation is therefore to enable project planning and implementation to be improved. Evaluations which do not fulfill this purpose are of no use from the manager's standpoint.

Project conditions vary according to regional and national characteristics, social and cultural factors, and other aspects. Evaluations need to take into account the aspects of projects which are unique and non-repeatable, while at the same time identifying those successes and problems which have wider applicability within and among countries. There is no guarantee, however, that even evaluations which are conducted effectively and which produce valuable information will help to improve project planning and implementation unless there is an organizational unit which will be able to act authoritatively on the basis of information from evaluations, or, at a minimum, to formulate guidelines and recommendations for improving projects. Both country officials and officials of international development organizations are aware of the need to make better use of what is learned from evaluations, but they are often not organizationally equipped to do so.

The greatest success in using evaluation findings has occurred when higher levels of authority in organizations have: (1) made it clear that evaluation is significant and that evaluation findings will be given serious consideration; and (2) established a sufficiently authoritative organizational unit with the capability for following up on evaluation findings. An analysis of the way evaluations have been undertaken shows that there are three basic approaches. These are ongoing or built-in evaluation, special evaluation and ex-post evaluation.

a. Ongoing or "Built-in" Evaluation

Evaluation has most consistently proven to be effective when it has been an integral aspect of project design and operation. As this fact has come to be more fully realized, there

has been a move in the direction of building evaluation into projects. A major advantage of this approach is that undesirable deviations from project plans can be analyzed and corrective actions more quickly taken. Conversely, the reasons for successes in projects can be determined, and successful practices disseminated to other areas or other parts of the project as appropriate.

The World Bank has attempted to build evaluation explicitly into some of the more complex and experimental projects which it has helped to finance. In the Papaloapan Basin Project, Mexico's first integrated rural development project, the Bank supported a monitoring unit, which was established in the Secretariat for Hydraulic Resources (SRH). Staffing proposed for the unit included an economist, a sociologist, and other technical personnel, including consultants, who could be drawn on as necessary. A major purpose of the unit is to record accurately the increases in production achieved and the costs of project components. The production phase of monitoring would be based on data from a representative sample of farmers in each irrigation district and in the rain-fed areas. Farm-level data include such factors as yield per hectare, farm-gate prices, degree of farmer participation, cropping intensity, and input mix for different crops.

Monitoring should not be confused with evaluation. The information which is proposed to be gained from efforts such as that of the Papaloapan Monitoring Unit allows project progress to be measured against some planned scale of accomplishment. Evaluation draws on the information gained by monitoring and examines why things went as they did and how future operations could be improved. The connection between good monitoring and good evaluation is a very strong one, especially so in view of the fact that project-level data has often been either lacking in reliability or completely unavailable. By gathering information keyed to proposed project outputs and objectives, good monitoring systems provide a more solid basis for evaluation, and remove a great deal of evaluation from the realm of speculation.

The PIDER Project, another Bank-supported project in Mexico, will draw on the services of a Center for Research in Rural Development (CIDER), which was established in December 1974. CIDER's evaluative efforts will supplement monitoring of physical progress of PIDER, while PIDER monitoring will identify reasons for differences between actual and planned investments and activities. But this monitoring will not thoroughly be able to explain why certain actions are more effective than others. The evaluation unit will concentrate on measuring the effectiveness of agency efficiency, community responsiveness, needed changes to original diagnoses of problems, and other factors. A further dimension of CIDER will be added by a back-

ground research group whose purpose will be to scan, evaluate, and disseminate selectively the findings of the research projects and of practitioners operating both within Mexico and elsewhere. The combination of monitoring, evaluation, and research proposed for PIDER is promising, but further observation will be necessary to test fully its effectiveness. It seems clear, though, that evaluators can apply their efforts more fully to a study of causal relationships, and thus provide more insight into why things went the way they did, because of the cumulative evidence gathered by both the monitoring unit and by CIDER. Evaluation teams, in short, will have less of a monitoring role to play, although one aspect of evaluation may continue to be to analyze and suggest improvements in the monitoring system per se.

The methodologies being developed for CIDER concentrate on acquiring, analyzing, and disseminating the information needed for decision-making. Some of the more widely applicable kinds of information which CIDER plans to gather and evaluate include a comparison of planned and implemented actions, inter-agency coordination, and intra-agency efficiency.

Evaluations of planned vs. implemented actions are designed to assess reasons for discrepancies in micro-region plans such as agency inefficiencies or community unresponsiveness. Annual evaluations will make correction possible for the following year's micro-region investment plan. To insure that complementary actions are proceeding as planned, inter-agency coordination will be evaluated. This will facilitate the meshing of interacting elements such as availability of credit, technical assistance for production, physical inputs (seed and fertilizer), and forage silo construction. The effectiveness of both governmental agencies and campesino organizations will be evaluated based on lessons learned from the Puebla Project and methods developed by Mexican development banks, including BANAGRO and Banco Agropecuario de Occidente.

Just as evaluation is directly related to monitoring, so is it also related to project design. One of the more comprehensive design schemes developed is the Logical Framework used by the U.S. Agency for International Development (AID).1/ While not itself an evaluation device, the Logical Framework sets the stage for evaluation. By providing a means of relating

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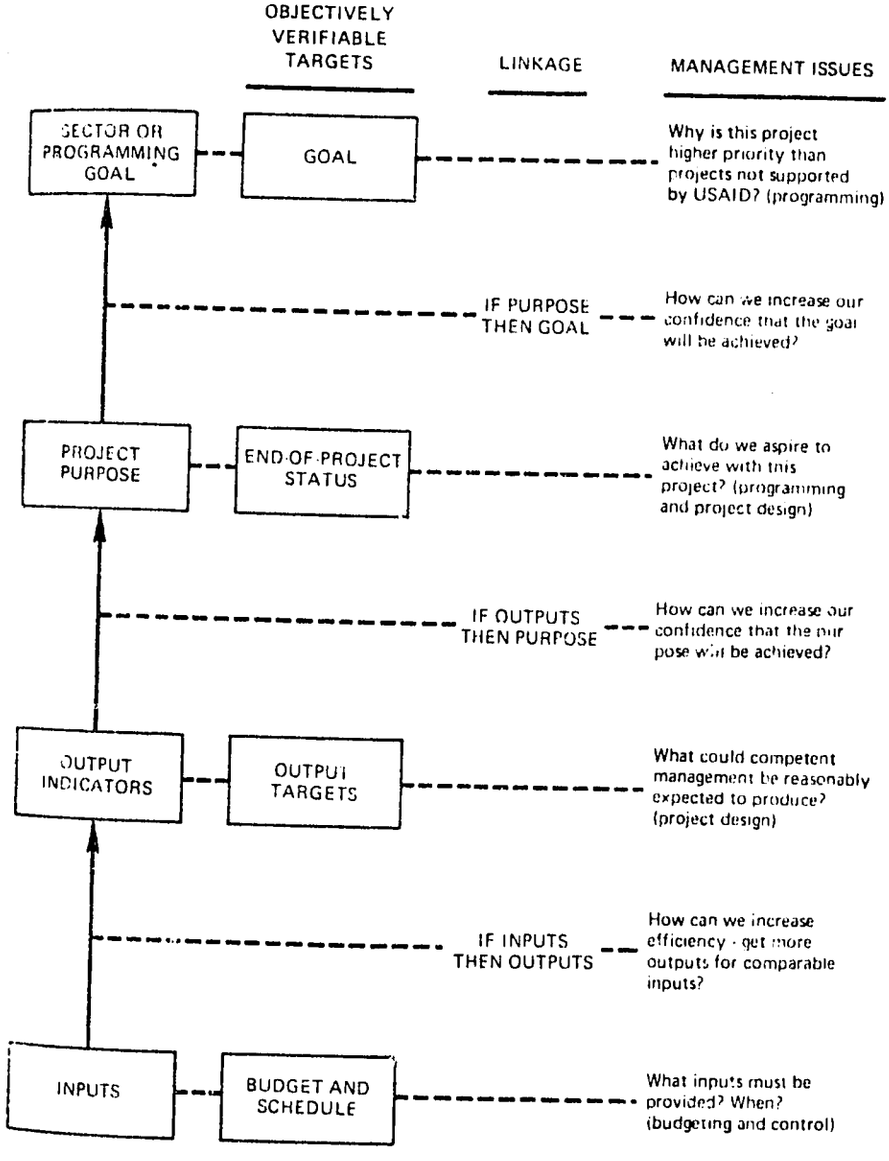
1/ See 585, A.I.D. Evaluation Handbook, and 501, Handbook #3, Project Assistance, Appendix 3E, which defines and illustrates the use of the Logical Framework, and 586 Project Evaluation Guidelines, which supplements the earlier Evaluation Handbook. 587, A.I.D. Use of Development Indicators, evaluates aspects of field use of the Logical Framework.

FIGURE 2

THE LOGICAL FRAMEWORK OF A TECHNICAL ASSISTANCE PROJECT



(585, p. 19)

FIGURE 3

AID 1020-25 (1-73)

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY _____ to FY _____
Total U. S. Funding _____
Date Prepared: _____

Project Title & Number: _____

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal: The broader objective to which this project contributes: (A-1)	Measures of Goal Achievement: (A-2)	(A-3)	Assumptions for achieving goal targets: (A-4)
Project Purpose: (B-1)	Conditions that will indicate purpose has been achieved: End-of-Project status. (B-2)	(B-3)	Assumptions for achieving purpose: (B-4)
Project Outputs: (C-1)	Magnitude of Outputs: (C-2)	(C-3)	Assumptions for achieving outputs: (C-4)
Project Inputs: (D-1)	Implementation Target (Type and Quantity) (D-2)	(D-3)	Assumptions for providing inputs: (D-4)

(586, p. 55)

systematically the inputs required and the project outputs expected to achieve the project purpose, the Logical Framework provides a consistent means by which A.I.D. can evaluate projects for which it provides assistance. In sum, it sets standards against which projects can be evaluated. To a large extent, A.I.D. evaluations then "consist of determining and validating whether or not the project outputs are being produced, whether these outputs in fact are serving to achieve the project purpose, and finally whether this achievement is making a significant contribution as planned, to the higher order goal." (588, p. 1) Figure 2 details schematically the way in which the Logical Framework is intended to operate, and Figure 3 is the Worksheet used to summarize the salient aspects of project design.

The Logical Framework concept is a tool for assisting in project design and evaluation. Like any tool, it can be used well or poorly. A.I.D. guidelines recognize, for example, the value of the participation of intended project beneficiaries in project design. (501, p. 5-4) Such participation allows the perceptions, plans, and needs of proposed beneficiaries and participants to be reflected in project inputs, outputs, and objectives, which in turn serve as one of the bases of evaluation. Beneficiaries' participation is therefore desirable because: (1) their knowledge of the conditions which are likely to affect implementation in some ways exceeds that of planners and technical specialists; (2) participation eliminates surprises when evaluations are undertaken about the nature and expected magnitude of beneficiaries' actions and resource inputs; and (3) experience indicates clearly that more effective participation is probable during implementation when beneficiaries are involved in the stages of project formulation.

The evaluation procedures built into the A.I.D.-sponsored projects and the approaches used in the World Bank projects, such as Papaloapan and PIDER, are primarily formal and centrally oriented, i.e., designed to feed information to the formal project management to aid decision making about changes in resource allocation and strategy. Another approach is oriented to self-evaluation, that is, evaluation by the project participants and beneficiaries which in itself serves as a vehicle for transferring management capability and responsibility,

An example of self-evaluation is that which was proposed by Belloncle and Gentil for the ZAPI projects in Cameroun. The ZAPI are "Major Combined Action Zones" which are analogous to integrated rural development projects. One of the aims of the project is to transfer responsibility for overall economic development in each of five ZAPI areas to a "Local Progress Concern" (LPC) as rapidly as practicable. Each LPC will have the the duty of promoting in its own area the aggregate of activities needed for the lasting and cumulative improvement of the

farmers' living standards. Evaluations indicate that production in the ZAPI areas has clearly improved, abandoned cacao plantations are again being cultivated, and significant communal steps have been taken for protection of cacao plants against brown rot and other problems.

The groups working in the ZAPIs have on several occasions affirmed their desire to rely on farmer groups, such as work teams and associations, to be major elements in popularizing participation in the project. At the time of Belloncle and Gentil's evaluation, the Local Progress Concerns had a formal monitoring system, with a paid employee acting as a monitor in each participating village. Belloncle and Gentil argue that the continued presence of a monitor at the village level is in actuality an obstacle to the formation of farmers' groups that would take charge of monitoring and evaluating their own progress. They believe, and there is evidence to support the view, that as long as there is a village-level monitor who gets paid for his work, the farmers will tend to see this as the business of the expert, rather than as something for which they should take the initiative. At the same time, the most advanced planters in the ZAPI have greater technical skill than the monitors, so there is no doubt that the capability for a self-evaluation program is present.

Under this condition, self-evaluation is proposed to consist of a sharing of experience within each Local Progress Concern, so that both causes of poor yields may be discussed, and appropriate techniques for increasing production can be spread from the more successful farmers to those who are lagging. If it proved that poor functioning of equipment used to spray cacao pods to combat brown rot disease was a major problem, the group could decide to have some of its members trained in equipment repair and maintenance. Trained members would then transmit techniques in this or one of many other technical areas to other LPC members as appropriate.

Such an approach is similar to the one used in the Comilla Projects, where weekly training sessions were provided for village representatives who then relayed the lessons of their training to farmers from their village. If problems arose in transferring what the village representative had been taught, it was the representative's responsibility to note questions and to bring them up at the following week's training session with the Development Academy's staff. It was thus the responsibility of the project beneficiaries to develop a self-monitoring and self-evaluation capability which could be continuously improved through practice and by calling on the experts when, at their discretion, they believed this to be necessary.

Neither the formalized built-in or continuing evaluation system nor the self-evaluation approach is necessarily a

sufficient means of evaluating all aspects of a given project. For this reason, other types of evaluation are usually undertaken. Nonetheless, built-in evaluation constitutes the quickest type of feedback and the best opportunity for effecting positive changes during the course of project implementation.

b. Special Evaluations

A special evaluation is defined herein as any non-recurring evaluation, excluding audits, undertaken during the implementation of a project. This kind of evaluation may cover all or some of the same ground as that assessed by means of a built-in or interval evaluation system, but special evaluations are usually undertaken by people external to the project. The scope of special evaluations may be confined to a specified region or operational sector, or may cover the entire project. Such evaluations may ask, and often have, not only whether the project has met or is in the process of meeting its specified objectives, but also whether those are indeed the objectives which should be attempted, or whether more effective ways of pursuing the objectives might have been utilized.

Thus, an evaluation of the Comilla Projects established that the basic pragmatic approach was a valid one, based on a continuing feedback system which allowed continual refinement of operating methods through interaction with the villagers whom the project was designed to help. The Academy for Rural Development, which was responsible for implementing the Project, drew on the methods of applied social science to adapt selected successful organization methods to their own social and economic setting. Among the methods drawn on were those of U.S. land-grant agricultural college extension, for testing and disseminating new agricultural methods; the Danish volkschule for adult education; and German agricultural cooperatives for organized savings and credit.

The Academy staff consistently stated that the key problem they faced was to adapt to local conditions rather than to search for new systems which would be pre-formulated and imposed on the project area. (494, p. 485) This, the evaluation found, was proper and had produced good results. However, in part because of this approach, and in part because of the physical isolation of the Project area, some valuable techniques which could have been used to improve the Project were not used. For example, a visitor to the Project introduced the idea of cost-benefit analysis as a tool for understanding and assessing project economic choices. The idea, which provoked considerable interest on the part of the staff, had before that time apparently been little used because the staff had perhaps become too involved with what they believed to be the uniqueness of their undertaking. (494, pp. 487, 488)

In order to know whether a project has had a favorable impact, it is necessary to have some idea of what would have happened without the project in place. In a strictly logical sense, this is impossible to determine. Project evaluators have attempted to resolve this problem by designating a group outside the project area as a "control group." The control group, in theory, is free of the influences which are brought about by the project. A baseline study is made of both the "target" population, i.e., the population group which contains both the proposed project group and the control group. The purpose of the tests is to insure that the control group and proposed project beneficiary group are similar in basic characteristics. Then, in theory, it will be possible to measure some of the important aspects of the project by a later test which would show differences between the project beneficiaries and the control group. Figure 4 indicates graphically an idealized study design for making comparisons between a control group and a group of project beneficiaries.

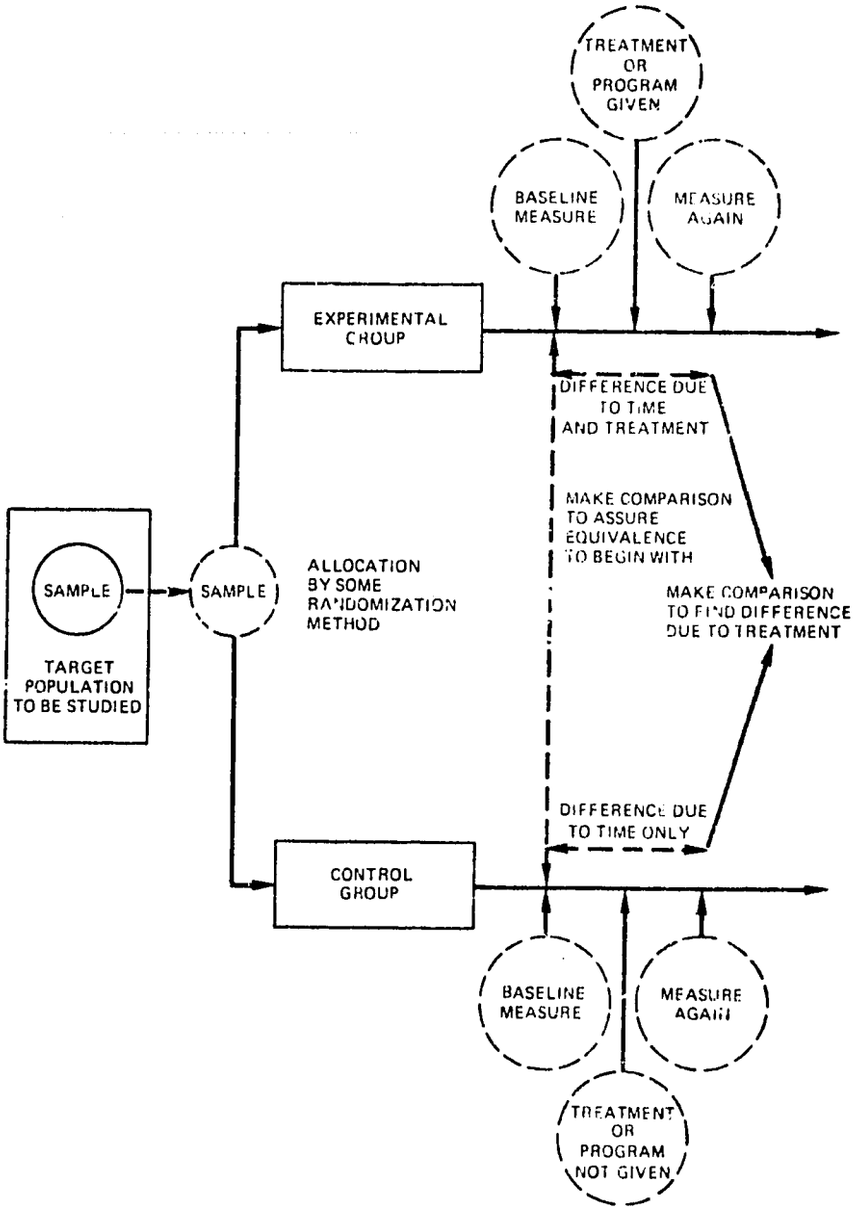
Such "before and after" studies were attemped at Comilla, as well as in many other projects. The economic modernization study at Comilla sought to measure economic and attitudinal attributes of a sample of Comilla cooperative members and made similar measures of a sample of farmers in an adjacent area. The evaluator comments that the before and after studies suffered from sampling design.1/ First, the farmers in the two areas differed from the outset sufficiently so that any changes that occurred could not necessarily be attributed to the project. Second, there were small, but perhaps significant differences between the economies of the two areas studied. (494, p. 491)

Unfortunately, in practice the world does not divide neatly into control groups and groups who will be influenced by projects. Most developing countries have development programs that reach, in some way, albeit a small one, most areas of the countries. This was true in Comilla, where the (then) Government of Pakistan had some programs which affected all areas of the country. Second, successful innovations have sometimes diffused rapidly, and there is no guaranteed means of confining innovations to a project area in a time of advanced technological means of communication. For some projects which have very limited objectives, it is true that innovations have been successfully applied in delimited areas. In projects such as integrated rural development, which attempts to reach large numbers of people over large areas, measuring project results by use of the control group method has been more difficult and costly.

1/ See 494, pp. 483-500.

Figure 4

"IDEAL" STUDY DESIGN FOR MAKING COMPARISONS



When circumstances warrant its use, the before and after methodology involving a control group or groups offers a means of selectively testing the effects of different project variables. But when there are doubts about the similarities of control and project groups, where expertise is not available to insure a high degree of research discipline, or where cost would be prohibitive, another evaluation scheme may be better than the control group approach. As noted in a recent study, the means of collecting and dealing with data must be oriented to the specific circumstances, and the researcher must be able to say: " 'These are the phenomena I am trying to understand; these, therefore, are the kind of data I need.' Efficient and reliable methods of data collection can only flow from the terms and nature of the subject being studied."1/ (589, p.xxi)

c. Ex-Post Evaluation

Considerable time and attention have been given to evaluating projects after their completion. In theory, ex-post evaluation provides information which allows the project cycle to be closed: from completed projects, data can be gathered and used to plan and implement other projects and programs more effectively. The following reasons have been given for undertaking ex-post evaluations: (1) obtaining an accurate picture of costs and benefits; (2) determining at what points and for what reasons the schedule for implementation was changed; (3) gathering and maintaining data on changes which were made and which continue to be brought about as a result of the project; (4) documenting results in order to generate political, organizational, and public support for the kind of development effort represented by the project; (590, pp. A6, A7) (5) determining how effective the strategy and operational procedures used were for attaining the specific objectives of this project; and (6) investigating whether the project objectives were in fact proper, in relation to sector objectives.

Some of the factors involved in estimating costs and benefits were discussed in the section on Project Preparation. While many of the uncertainties which made cost-benefit analysis difficult at an earlier stage will of course have been resolved when an ex-post evaluation is conducted, some remain. If a reasonably accurate accounting has been kept of the funds,

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1/ For practical guidance in data collection and measurement, see 589, Field Data Collection in the Social Sciences. An older, but still extremely useful treatment of data collection and measurement is found in 591, Measuring the Results of Development Projects. For ideas about the areas which require evaluation on projects, see the Checklist at the end of this chapter, and 546, from which it is taken.

units of worker time, and equipment, commodities, and other materials secured and expended during the project, the costs of the project can usually be ascertained within a relatively short time after the completion of the project. But where project accounts have not been kept well as the project was implemented--which has often been the case--serious problems have arisen in determining project costs.

In a number of cases, participating ministries and organizations, sometimes including the ministry which has major responsibility for a project, have charged support services for projects to a general program allotment. When a number of different ministries has been involved in one project, this has led to an understatement of project costs. The data requirements for accurate ex-post evaluations can thus be seen to have their roots in the earliest stages of the project. In fact, the basis for evaluation is established, and must be clearly reflected, in the project objectives and work plan. At a minimum, major cost components need to be identified at the point when an accounting system for the project is set up.

A problem which has continuously bedeviled project evaluations is the lack of readily available data. One attempt to solve this problem has been to build into project design the capability to gather, assess, and utilize data as the project unfolds. Where this has been done, ex-post evaluation has been greatly simplified.1/ The most effective monitoring and reporting systems have gathered and reported data tuned to the objectives of the project. A project with the objective of providing long-term credit for on-farm investments in well-irrigation, limited mechanization, and dairy livestock facilities was planned to affect a group of about 60,000 farmers in Bolivia. Because much of the basic information required for the project was either lacking or of limited reliability, data collection was built into the project, in order to provide project management with rapid feedback which would allow appropriate modifications to be made, and to enable an evaluation to be made of how well the chosen strategy was achieving project objectives.2/

1/ A comparison of field practioners' experiences in gathering and using field data is given in 589, Field Data Collection in the Social Sciences: Experiences in Africa and the Middle East.

2/ See pp. XI-54 - XI-61 and Chapter 16, "Monitoring, Reporting, and Control" for discussions of building in evaluative techniques.

It is even more difficult to estimate project benefits than it is to estimate costs. For one thing, some of the most important benefits of the project may not be readily apparent soon after the conclusion of the project. An AID-supported fertilizer project in Korea, which was for a decade considered to be an abject failure, provided training to a considerable number of Korean engineers and technicians. Later, these same engineers and technicians were able to get two large fertilizer plants built well ahead of schedule. The Korean Minister of Science and Technology attributed the later successes to training received in the earlier project which had been deemed a failure. (469, pp. 44, 45) If, as many people believe, trained manpower is a major factor in self-sustaining development, the final analysis of project success may not be possible for several months, or in some cases for several years after the formal conclusion of the project. Sweeping generalizations about project success and failure immediately following projects' conclusions have often been inaccurate. Caution is advised when data have not been collected and recorded properly.

It has also been observed that the more immediate and tangible results of projects have at times been less significant than later, less obvious results. One expert evaluator has noted: "The ultimate test to be applied may be whether or not the project generates its own continuing and expanding activity. . . . Another significant measure of the likely permanence of 'project-induced' changes is the extent to which project activities have been institutionalized." (591, pp. 21, 22)

The following questions might be some of the ones which evaluators would want to consider in establishing the parameters for evaluation to indicate the degree of institutionalization which has taken place:

(1) Have new methods and training been incorporated into the normal life of project participants and do they persist and spread?

(2) Have the people of the project area come to believe that progress is possible?

(3) Have methods of investigation been inculcated so that similar (health, education, farming) problems of new kinds can be solved by the people?

(4) Has an appropriate organizational unit been established and have staff and a budget been provided to continue the activity?

(5) Have communities or groups in the project area incorporated activities into their own local institutions? Do individuals practice new methods within their informal group? (List adapted from 591 and 586.)

(6) What unplanned changes have occurred and what are their effects?

(7) What non-project factors have aided project programs? Can they be drawn on in the future?

(8) Could a different project be designed to yield similar benefits, but at a lower cost?

If these questions yield positive response, it is likely that the project can indeed be termed a success. These are significant questions to have from the beginning, and they should influence project design, as well as form one basis for subsequent evaluations.

d. Which Type of Evaluation Should Be Used?

The use of any one of the approaches to evaluation--built-in, special, or ex-post--does not exclude the desirability or the need to use one or both of the others. In an ideal situation, it would certainly be possible and desirable to use all three. Nonetheless, evaluation efforts bear a price tag, and the careful manager will limit evaluation to those efforts which appear most likely to yield information which will allow the project to be managed in the best way possible at a reasonable cost. From this viewpoint, ex-post evaluation is clearly the least desirable method of project evaluation. In sum, its shortcomings are: (1) it is ex-post--one cannot improve a completed project; (2) mechanisms to transfer lessons from one project to another are often deficient or in some cases lacking altogether; (3) there has been a tendency to concentrate on critical findings to the exclusion of carrying forward positive practices for wider dissemination; (4) highly specific findings are not broadly applicable, and what has been found to be either a mistake or a good practice in one project does not necessarily prove to be in another project.

Special evaluations have proven to be useful, but are often expensive, both in terms of paying for expertise from outside the project, and in terms of the time necessary to brief outsiders, which in some cases has cut into the staff time that could itself have been spent on improved implementation. A further drawback in some cases has been the lack of the special evaluation efforts to produce sufficiently detailed recommendations for change. Findings have often been too general, with too little advice on how such findings can be worked into the actual implementation of the project. This is a charge which has often been leveled at external consultants who, for example, present determinations that "extension workers are underpaid." Project personnel are usually quite aware of problems of this type, but little good has come of such findings when the remedies are beyond reach, or when changes would be

required on such a broad scale that a government-wide reorganization would be required.

The single most effective method of evaluation is built-in evaluation. Experience suggests that evaluation should be built in from the outset by: (1) seeking consistency among project aims or objectives, inputs, and outputs; (2) stating success criteria in terms clearly perceived by all involved in the project; (3) involving project beneficiaries early and continuously in establishing and clarifiying aims; (4) separating monitoring and evaluating, so that evaluations can concentrate on substantive analysis; and (5) providing sufficient flexibility for managers to adjust the forms of the project to meet changing conditions that are inherent in most development activities.

To enhance the likelihood of effective evaluation, built-in evaluation supplemented by special evaluation has offered the most effective combination of approaches. Where specialized expertise has been needed, the freshness of an outsider's analysis has been salutary, provided that sufficient guidance on the background, aims, and desired outputs of the project have been provided to the outside evaluator, and provided that the recommendations of the evaluators have been sufficiently clear and detailed to be implemented.

Evaluations are useful to the extent that the results and the interpretations of the studies are utilized in the planning and decision-making process. The problem arises as to how to insure that this analytical input can be fed into the planning process. One method which has been used by the Shell Company to disseminate the lessons of the project experience is through training courses and on-site visits. The possibility of creating training centers alongside several of the projects to implement this process has been suggested. (592, p. 17) In the Puebla project, it was decided to make evaluation an integral part of the project in order to obtain not only before and after measurements but also to provide continuous feedback to those in charge of the action program. The staff evaluator interacted with the project team to work out a solution to the problems that the evaluation isolated. This often involved direct interaction with representatives of the various service agencies to modify operating procedures.
(40, pp. 81-82; 271, p. 108)

In order to effectively influence planning and design activities, the form of the data, analyses and interpretations must be appropriate to the decisions at hand. Experience shows that one method of providing a useful framework for evaluation results is the isolation of critical or causal factors in an activity's <u>success</u>. A system of this type gathers information about present successes, innovations, and new ideas, and looks

forward to new objectives and new strategies which would be evolved to bring about the adoption and application of these successful experiences. This can be done through evaluations which take care to recognize the successes and to analyze their causes. (504, pp. 5-8) This process has been used successfully in the Shell Company rural development projects. The successful factors were then incorporated through training exercises into project planning in the form of design guidelines. (592, p. 17) Another example of this type of evaluation is provided by a rice production improvement project in Cambodia. In this study, six factors relating to administrative procedures and technician characteristics were cited as primarily contributing to project success. (58, p. 11) The contrasting but prevalent practice of focusing on the analysis of project problems gives no clear guidelines for future planning. There are many ways to do something wrong but few ways to do it right.

Experience has shown that the objectives and values of the evaluation team can become substituted for the objectives of the project. This happens most often when the evaluator has unclear or ambiguous objectives upon which to base evaluation measures. In a recent evaluation of a Tanzanian beef ranching project, the statement was made that the most important function of beef ranching in a country like Tanzania is to generate a maximum of funds for investment in other sectors of the economy. However, nowhere in the assessment of the project can one find mention of this objective being the primary one in the project design. In a Costa Rican agricultural project, a team of evaluators found a discrepancy between the project objective of increasing rural incomes and the project strategy of increasing production. This led to an inability to evaluate the project in terms of the project design. These and other experiences have shown that clear and definite objectives are necessary in order to undertake a useful evaluation study.

While this seems self-evident, tremendous problems resulted when area and situation-specific factors have not been adequately considered. Attempts to transfer Comilla's successes (Bangladesh) to CADU (Ethiopia) were impossible because CADU's planners did not adequately consider the quite different social, governmental, and land tenure factors in Ethiopia. (545, p. 357) Evaluations need to note clearly those successes which seem unlikely to be duplicated elsewhere, or which could be replicated only if certain measures were taken, because they depend on a specific set of local conditions. If any of these local conditions necessary for success are not isolated, then future project designs may include a set of assumptions inappropriate to the local project environment.

Figure 5

A Tentative "Check List" for a Comprehensive Evaluation of Integrated Rural Development

No.	System Components (Factors)	Indicators and Descriptors	Measurement of . .
1	Agricultural Production (economic)	a) yield of production	level, change, and efficiency of crop, animal and forestry production
		b) per capita income	level, changes, and distribution of agricultural income; consumption pattern
		c) savings and uses	level and change of investment level and pattern
		d) technology and responsiveness	rate of shift from traditional to improved; tools, methods, inputs, etc; rate of adaption of innovation and pattern; response to economic opportunity
		e) resource conservation	level and change of land use; erosion; water-use; forest exploitation; etc.
		f) employment	level, change and trend in unemployment and under-employment
2	Education (social, cultural, and economic)	a) intellectual skills	rate of literacy; availability of skilled manpower; relevance of content; method and learning environment, to need.
		b) technical knowledge	level and change in participation; expenditure for education

		c) opportunity	equity and equality of educational opportunity distribution
		d) cultural dev't. and preservation	method and content of mass-education
		e) political awareness	(mass-media, etc.) for cultural and political education
		f) persuasion	pattern of persuasion
3	Governance (political and administrative)	a) equity of resource allocation	level and change in pattern of distribution of means of production
		b) freedom and justice	freedom of expression; access to justice
		c) participation and involvement	equal opportunity for popular participation in governance (electing leaders, etc.); decision-making process
		d) administration	pattern of public administration; its responsiveness; access to bureaucracy; local governance; autonomy; effectiveness
		e) special organizations	pattern and efficiency of private sector; availability of services; opportunity of collective bargaining for rural people (associations, cooperatives, etc.)
		f) linkages	coordination of services and activities of system components
		g) security	protection against natural disaster and human violence (law and order)
		h) financial source	system of revenue collection and allocation

4	Health (social)	a) longevity and mortality	level and change in: life expectancy at birth, infant mortality (birth and death rates)
		b) public health services	the quality and quantity of preventive and curative services (health worker-clientele ratios, content of available services); availability and access to services; expenditure on health
		c) nutrition	per capita caloric and protein consumption
		d) housing	sanitation (i.e., per capita space, ventilation, lighting); health education efforts; disposal facilities
		e) hygienic living	personal hygiene; extent and adequacy of safe water supply and food preparation tion
		f) responsiveness	attitude of population toward public health innovations (family planning, immunization, sanitation measures, hygienic practices)
5	Infrastracture (social, political, and economic)	a) communication	extent and accuracy of: feeder roads, telecommunications, and others
		b) water supply	water for human and animal consumption; irrigation and other purposes
		c) expenditure	communications; infractracture development and maintenance
		d) distribution	communication facilities

6	Marketing (economic)	a) incentive	extent and accuracy of: provision of incentives, i.e., fair prices, demand, etc.
		b) storage	availability, appropriateness, and access to storage facilities
		c) income distribution	patterns of marketing outlet; systems; equity of income distribution
		d) processing	processing facilities; relevance; efficiency
		e) organizations	farmer and consumer organizations for collective bargaining and protection
7	Nonfarm Production (economic & cultural)	a) employment	level and change in: rate of unemployment and underemployment
		b) production	availability; relevance and efficiency of nonfarm production activities; rate of savings in foreign exchange; access to goods
		c) demand	demand for commodities produced; consumption pattern
		d) income distribution	level and equity in distribution of employment opportunity; wage structure; means of production
8	Research (cultural, social, political & economic)	a) availability, orientation, and relevance	extent and adequacy in rural-orientation of research efforts; relevance to prevalent problems (relation to system components)
		b) distribution of services	equity of access to research services; ratio of research institute; quality and quantity of new developments

		c) expenditure	expenditure on rural-research activities
		d) dissemination and adoption	method of dissemination of research findings; rate of adoption; effectiveness in reaching right target (clientele)
9	Supplies (economic)	a) organization	extent and adequacy of distribution system; efficiency; accessibility
		b) credit	availability; access for small farmers; favorable terms; rate of participation; rate of return
		c) goods and services	availability of goods and services; rate of consumer satisfaction; uniformity and fair prices; equity of distribution
10	Welfare (social, cultural, religious, psychological)	a) social security	extent and adequacy of system of welfare benefit for disadvantaged (aged, disabled, orphaned, unemployed)
		b) recreation and leisure	availability and distribution of recreational facilities; access; quality; ratio; impact on dev't. components.
		c) community life (family ecology)	patterns of association; kinships; partnership; family living; self-help; spiritual and traditional beliefs; impact on dev't. components
		d) psychological	attitude toward life; value orientation (work, achievements, etc.); impact on dev't. components

(546, pp. 9-16)

XII. ORGANIZATION FOR PLANNED AGRICULTURAL DEVELOPMENT

A. Introduction

1. The Administrative Constraint on Development

The literature on agricultural and rural development is replete with accounts of how development has been hampered by ineffective or disorganized public administration. A group of officials sent by the Indian Government to various states in 1963 to review the progress of agricultural programs, reported that "unsatisfactory administrative and organizational arrangement was by far the most important single factor responsible for poor results in agriculture." (70, p. 271) A body of experts subsequently placed the blame for improper and inefficient implementation of India's Intensive Agricultural District Program squarely on the shoulders of that country's "archaic administrative system" which had proved to be "woefully inadequate for any operation, the aim of which is not to maintain the status quo but to change it." (195, p. 73)

The United Nations has reported that

> problems of organization and administration have increased in number and complexity during the process of development in the Arab countries and through the expansion and new responsibilities of their agricultural services. Problems, caused by poor internal organization and management, are especially acute within the Ministry of Agriculture, since it is ordinarily one of the oldest agricultural organs of government. Yet, similar problems are frequently to be found in newer or more specialized establishments. (434, p. 3)

Similar accounts emanate from Africa. For example, one report states that

> The basic underlying institutional constraint to agricultural development lies in the low priority, dispersed nature, and inadequate staffing of government agencies dabbling in agriculture...Institutional constraints provide some of the more immediate reasons why output -- and as corollaries, employment and rural incomes -- has failed to expand or has stagnated.

Other examples can be given for Latin America. Even in highly-organized China, it has been suggested that

> Administrative failures may have been one reason for the frequent choppings and changings of policy . . . (559, p. 131)

2. The Problems and Their Setting

Public administration covers every aspect of government activity. It is inextricably interwoven in the warp and woof of the fabric of government. The fundamental changes in the functions of governments in low-income countries in recent years and the changing environments in which they must work have enhanced awareness in these countries of the need for administrative and organizational effectiveness. Achievement of independence, or the replacement of inefficient governments by reform-oriented ones, the introduction of planning for development, and the enlargement of the scope of government to meet the mounting aspiration of people for more education, health facilities, better nutrition and public services, as well as higher incomes, require far-reaching changes in public administrative systems and institutions to meet the new challenges.

In no sector have these needs been greater than in agriculture. There, a number of problems arise which make questions of administrative and organizational betterment especially difficult to deal with. The first of these problems arises because, in contrast with industry, agriculture is composed of many, usually dispersed, units. It is incomparably more difficult for agriculture than it is for industry to introduce improved methods of production. To introduce new agricultural methods organizations specializing in extension services, agrarian reform, farm credit and irrigation, as well as a hierarchy of institutions that bridges the gap between national planners and thousands or millions of farmers working in many localities. While there are a great variety of organizational and institutional examples to choose from -- including ministries, quasi-governmental development corporations, credit banks, extension services, councils and committees (at national, regional and local levels), cooperatives, other producer organizations, marketing boards and agribusiness firms -- they are not easy to establish and to build up. (560, pp. 39-40; 561, p. 241)

Second, different approaches, and frequently different kinds of institutional structures, are needed for farmers who are still largely in the grip of traditional subsistence agriculture than for farmers in active transition to commercial agriculture or who are already commercially oriented and technically sophisticated. For many less developed countries, the task of establishing and operating organizations which meet the needs of these different kinds of farmers is beyond their capabilities. (182, p. 10)

Third, institution building takes a great deal of time, even if the commitment to it exists and the necessary decisions for its achievement are made. Frequently, however, the time required for institutional development, and alterations in the distribution of political and administrative power that such development implies, deter policy-makers from taking the required steps. (231, p. 187)

Fourth, organizations and institutions are only as good as their staffs. The formulation of agricultural policies and the implementation of programs which adequately reflect these policies require large technical staffs with specialized training and experience, and the sound judgment which comes from long and continuing service. (573, p. 1) In most less developed countries, factionalism rooted in party politics or other political activity makes difficult the institutionalization of a technically expert, efficient, honest and well-coordinated bureaucracy. (182, p. 10)

Fifth, many new countries have inherited legacies of institutional structures which are ill-suited to agricultural and rural development or which are incompatible with their present political organization. Every new African country has sought to modify its inherited administrative structures to meet the requirements of agricultural and rural development in an independent state. In Africa, new nations have concentrated attention on breaking up the provincial administrations which constituted the chief agent of central control by colonial governments. (562, p. 17) In Bangladesh, the imperial territorial symbol, the police station, was replaced by the thana. (490, p. 4)

Sixth, for many old countries and some new ones, the problem is either the existence of outmoded organizations incompatible with development goals or the lack of precisely defined functions and authority of newly-established departments and agencies vis-a-vis long established organizations. Both among traditional and newer organizations, functions may either overlap without design (e.g., in those concerned with agriculture and community development) or supplant one another without coordinated efforts toward solving development problems. (554, p. 659) These anomalies frequently interfere with farmers' activities. As one writer reporting on the Indian situation, put it:

> All too often the promised fertilizer and improved seeds do not arrive in time for planting. Not infrequently, the farmers are unable to get a loan in time to purchase package inputs...simply because of inefficiencies and delays in processing loan applications. Demonstration equipment lies idle for lack of repairs and soil testing falls months behind schedule. Crop spoilage occurs for lack of storage, processing or transportation facilities and various kinds of technical information which should have been

conveyed to the farmers were not; often with dire consequences. In sum, agricultural development is being depressed by administrative ineffectiveness. (56, p. 1)

Seventh, in many organizations there are conflicting interest groups with objectives which may be incompatible with those of their organizations; or there may be political motives, red tape, corruption, paternalism and inefficiency to hamstring organizational operations. Personal rivalries and strivings for personal status and power can also interfere with institutional effectiveness. (434, p. 3; 554, p. 659) These attributes -- which may be described as problems of "human organization" -- exist to a greater or lesser degree in the institutions of all countries, developed as well as less developed, and must be taken into account by those attempting to improve relationships within organizations, as well as between agricultural organizations and farmers. (563, p. 114)

3. Dealing with the Problems

Although it should be obvious, it is often hard to get people to understand that there is no universal organizational and institutional blueprint which can be used to deal effectively with these problems. The search for universal solutions goes on despite the mounting evidence that such solutions almost never have been productive. (90, p. 74) Nor are they likely to be. For one thing, the needs and policies of all governments are not likely to, nor should they, be identical. Different needs may require different solutions. (56, p. 2) An organization or institution is not an end in itself; its inherent value derives from its ability to achieve desired policy and program objectives. (425, p. 49)

Second, an organization or institution must take into account the existing patterns of governmental authority, as well as the way in which civil servants operate. The system of authority and the bureaucracy of each country is unique in its history, ability, requirements and organization. It is unwise to expect that that bureaucracy can be manipulated to become what it is not, except perhaps over many years. (412, p. 7) Account must be taken -- not as something to be added in to any analytical scheme post hoc, but as intrinsic to the problem -- of the inherent characteristics of the human material available to staff an organization and the relationships which exist among the bureaucracy. (90, p. 74)

Third, the design of an organization or institution should take into account the personal and social characteristics of the clientele it is to serve. (56, p. 2) Since the ultimate clientele of most organizations in the agricultural sector is composed of farmers, it is their needs which must determine the form and character of institutional and administrative structures

in the sector. The farmers' social situation and needs, the crops they grow and the processing or marketing channels involved are of critical importance for the success of the organizations in the sector, even more than the political complexion of the government. (563, p. 119) Agricultural development goals can be achieved more easily if they build upon elements of the existing social order instead of attempting to work against it. Of course, it is impossible to maintain some elements of the status quo if agricultural and rural development are to go forward. However, experience shows that unless agricultural and rural development programs are adjusted to local conditions, serious difficulties may arise. A case in point is the initial failure of the Chinese commune experiment, partly because the authorities ignored or attempted to destroy the traditional marketing structure without offering a viable alternative. The failure of the experiment, despite the Government's authoritarian powers and propaganda programs, showed how dangerous it was to replace rather than build on the systems peasants had developed over centuries. (97, p. 361)

When an organization is established, it should be designed specifically to achieve the purposes for which it was set up. The most effective organization is likely to be one which has been designed to give effect to specific policies or to implement a specific program, rather than to deal with a broad spectrum of ill-defined problems. (56, p. 2) However, this is not a magic formula for institutional building; for changing objectives and situations over time may require adjustments in structure and adminstrative procedures. This underlies the need for continuing examination and evaluation of the structure and practices of an institution in relation to the functions it is trying to perform. (56, pp. 2, 3)

While the specific cultural, social and political environment should be the starting point for organizational and administrative betterment, institution builders can learn much from the experience of others by applying existing knowledge that is relevant to their task. (425, p. 56) Thus, a proven principle is the desirability of setting up organizations which are reasonably simple in operation and which are designed to yield speedy answers to problems. Such organizations are especially desirable where trained and experienced staff, as well as telephone, secrearial, transport and other resources are limited. (563, p. 119) This means that institutions modelled on the pattern of those in developed countries are not likely to fit in with the needs in less developed countries. (473, p. 54) For reasons of ideology or because of preconceptions, those who establish organizations sometimes pay more attention to the form than to the substance of the institutions they set up. (231, p. 187) This is a mistake, especially if it leads to the creation of complicated "tall" organizations, with many levels of administration. Experience shows that the more the number of levels of administration, the slower the movement of information, either from the

top down or from the bottom up. In contrast, a "flat" organization, characterized by relatively broad spans of control (in which the number of persons reporting to any supervisor is limited to those he can effectively oversee) is likely to be more effective. (412, p. 7)

In sum, while there is much to learn from the experience of others in the field of institutional and organizational betterment for planned agricultural and rural development, the starting point must be farmer's needs as well as the cultural, social and political environment in which they work. Organizations which are designed to carry out specific policies, programs and projects are likely to be more effective than ones which are established as catchalls for sundry problems in one or more aspects of agricultural or rural development. These factors should be borne in mind by institution builders who seek to organize the agricultural sector.

B. Organizing the Agricultural Sector

1. The "Wholistic" vs. the Partial Approach

Agricultural development requires a wide range of administrative agencies. Some decisions involving coordination and development of nationwide plans and programs require action by the central government. Regional and subregional development requires regional and subregional organizations. Final execution of plans, programs and projects must be carried out at the local level and requires local institutions which may be in the private or public sector. If they are in the private sector, their organization can be influenced indirectly through incentives or directly through regulation. If they are in the public sector, they may be established by intervention of national or regional authorities, or they may be formed from below by farmers or others in the localities. (127, pp. 389-390)

The paucity of effective agricultural institutions in many countries has given rise to questions concerning the best way of approaching the problem. Is it desirable to improve agricultural organizations on a piecemeal basis or is it better, if not essential, that attempts be made to deal with the problem in a "wholistic" way? There are advocates for both points of view. Thus, a World Bank Mission, concerned with the situation in Ethiopia, stated that

> The administrative and organizational constraints to agricultural development are unlikely to be removed until substantial improvements are made in public administration as a whole.

In contrast, another view referring to administrative and organizational change in general, holds that

> Government-wide administrative reform programs devoid of a sense of practical politics are destined to failure . . . any government-wide strategy must contain a sense of the feasible; it must identify those areas, those organizations, those agencies which are the most critical and which provide the greatest opportunity for change. Otherwise, little can be expected except increased formalism. (564, p. 429)

Given the magnitude and scope of the public administration problem in low-income countries, especially as it relates to agriculture, there is an understandable tendency on the part of those aware of the needs to address themselves to overall administrative and institutional reform. However, experience shows that the establishment of new agencies, however well conceived, frequently brings little or no improvement in public administration because the new agencies prove not to be immune from the malaise which afflicts the rest of the body politic.

This is hardly surprising to anyone familiar with the history of attempts to initiate general administrative and organizational reforms in low-income countries throughout the world. India, Pakistan, Iran and the Philippines in Asia; Ethiopia, Ghana and Libya in Africa; Venezuela, Colombia, Ecuador, Brazil, Argentina and Chile in Latin America; to name only examples, for many years sought to improve their institutional and administrative facilities with only modest successes to show for their efforts. Proposals for global administrative and governmental reforms, which in the abstract appeared desirable and reasonable, have frequently ended up as distorted, piecemeal solutions after implementation which bore little resemblance to what was originally intended. Or, where implementation of an overall institutional reform was actually carved out in more or less the intended fashion, it proved to be beyond the absorptive capacity of a public service committed to traditional ways. (565, pp. 3, 4)

One can only agree with the conclusion of the Public Administration Branch of the United Nations Secretariat, made after a review of U.N. projects related to major administrative reform that "administrative improvement is a long-range and difficult process." (566, p. 45) Nor can there be any quarrel concerning the accuracy of the U.N.'s contention "that far-reaching changes of a fundamental nature are essential in political and social spheres as the first step in administrative reform." (566, p. 45)

Thus, a question arises whether the trouble with most efforts to improve organizational and administrative structures in less-developed countries has not been that too much has been attempted at once. Given the right political and social environment, comprehensive efforts at institutional and administrative reform can undoubtedly succeed "if pursued consistently and with full realization of the complexity of the task and the nature of the resources required." (566, p. 45)

But what is the appropriate strategy when "the right political and social environment" does not exist and where governments are unwilling, or as is more likely, unable to make the far-reaching and fundamental changes which the U.N. correctly considers to be the first step in major administrative reform? Is the prescription to be "wholistic," as Kleber Nascimento of Brazil has called attempts at administrative reform in his country, rather than partial; sudden rather than gradual; general rather than specific? Is it sensible to continue with this approach although little has been accomplished by it in the past and there is no valid reason for believing that the "right political and social environment" is closer to realization in most low-income countries? (565, pp. 4, 5)

Anyone with experience in low-income countries in early stages of development soon comes to know that attempts at fundamental, across-the-board reform to create ideal systems in any field of activity are likely to be premature and self-defeating. The necessary pre-conditions for the success of such efforts, however justifiable in terms of need or desire to do the right thing, simply do not exist.

On the other hand, the evidence shows that partial administrative and institutional reform, or at least improvement, is feasible in selected instances -- be it in connection with projects, programs, economic or social sectors, or geographic areas or whole regions -- where the required preconditions for successful comprehensive reform do not exist. Where the need to get something important done arouses in political or other authorities an awareness that administrative and organizational change is essential to the success of the venture, where the venture is backed by a powerful person, group or entity which is likely to stay powerful and interested long enough to allow reforms to be institutionalized, and where the proposed reforms are not beyond the capacity of the governmental unit(s) concerned, the prospects for administrative reform are good. These prerequisites to reform may of course exist in some less developed countries in some periods in sufficient strength to permit global reforms to be instituted; but if experience counts, it would be much more realistic to assume that in most low-income countries the lack or insufficiency of one or more of the preconditions dooms most attempts at global reform. It is not defeatism, therefore, but prudence, nurtured by experience, that counsels the necessity for the courage and patience to think small. (565, pp. 5, 6)

For most less developed countries, the comprehensive approach to administrative and institutional reform may not be so much wrong as it is premature. Partial administrative and institutional changes may not be as neat and satisfying as a global overhaul of organizations in the agricultural sector, but the choice between global and partial reform may not be a real one. This is so because the many failures of attempts at global administrative and organizational reform have made it clear that the governments of many less developed countries are not equipped

with the managerial skills and decision-making powers to effectively carry out global reforms. The evidence accumulated thus far shows that in most less developed countries, most administrative and organizational changes (whether proposed originally as global or partial reforms) have really been piece-meal in nature. If effective, they may well have served as models in other parts of government; if ineffective, they may well have made it clear that further reform is required. In either case, partial reforms may have induced further reforms and have prepared the way for a more fundamental, across-the-board, advance. This is not hypothetical. It describes what has happened in some countries.

2. The Need to Think Small

Certain conclusions follow from these observations. In most countries at most times, it would be well to adopt a modest approach to institutional and administrative reform in line with the political realities and power relationships within the governments concerned, as well as within the perceived limits of administrative capacity. In fact, taking a leaf from medicine, where conservative practice dictates the prescription of only the minimum dose of a drug required to produce a cure, those concerned with institutional and administrative reform should eschew the temptation to introduce more than the minimal changes required to give reasonable expectations that organizations will achieve the objectives they have adopted.

This implies, first, that very strong reasons are needed to justify the creation of new organizations to meet apparently new needs, rather than modifying or re-invigorating existing ones. (234, p. 25) Since old administrative structures are frequently inadequate for promoting agricultural development, there is an understandable urge on the part of those impatient with the slow pace of development in less-developed countries to resort to the creation of new structures which are free of the constraints of existing ones. But for a number of reasons, the creation of a new organization may be a mistake. For one thing, it may be costlier and more time consuming. For another thing, the bypassing of an existing organization through the creation of a new one may arouse resentment and bring on confrontations with those who have vested interests in the old organization. Thus, the Plan Chillan, a regional development program in Chile, created opposition which raised serious problems for the program; it elected to set up a new extension service in the three provinces in southern Chile where the Plan Chillan was being carried out. Had it used the institutional structure already available, a choice which appears not to have presented insurmountable problems, the opposition which establishment of the new extension service aroused might have been avoided. (296, p. 519) A similar situation arose in Pakistan when a new department was set up to deal with community development. The rationale for the new department was that the existing departments of agriculture, health and education had become bogged down in red tape and were therefore

incapable of working at the village level. Proponents of community development contended that the new department would inject new spirit into the older departments and coordinate their efforts at the point of contact with the public. Neither was realized, however. Instead, jurisdictional problems arose when the established departments preceived the community development department as intruding into their fields of activity. (275, p. 681)

Finally, in the traditional environment existing in many low-income countries, new organizations have a way of acquiring all the unwanted characteristics of the old ones, as well as a few of their own. This is not surprising, since the administrative procedures and structures of a country are almost always rooted in the cultural and other social attributes of the society. This means that administrative and institutional change is bound to be a slow process, dependent on gradual change in traditional attitudes and customs. It also means that the mere creation of a new structure, by itself, is unlikely to result for long in a major deviation from existing administrative and organizational forms and procedures. While there are times when new structures should be established, either because the functions to be carried out are fundamentally different from those performed by existing organizations, or because existing organizations are so imbedded with social, political or personal problems that they no longer are viable, consideration must be given to the fact that it is almost always more difficult to build workable institutions from scratch than to reform those already in existence.

3. The Organizational Dilemma

Attempts to organize the agricultural sector on a rational basis soon encounter a dilemma: on the one hand, the various elements which combine to promote development are frequently so interrelated that a single coordinating body is needed to insure that all the required elements mesh at the required times and places; on the other hand, the scope of agriculture -- encompassing as it does the production of annual and perennial crops, tree crops, forest products, animal products and fish; their distribution for domestic consumption and export; and provision of a wide variety of essential production and distribution inputs which may include seeds, fertilizers, water, storage, transport, credit, research, extension activities, soil conservation, land clearance, agrarian reform, settlement or resettlement -- make it impossible for one organization to deal effectively with all the multifarious aspects of agricultural development. The dilemma is made more intractable because farmers and agribusinessmen in the private sector -- as well as politicians, technicians and general civil servants in the public sector -- often play critically important roles in the development process; and in federal governments, like India and Nigeria, state governments share with central governments considerable responsibilities for agriculture which results in further intensification of the predicament. And the dilemma gets even more difficult to

resolve when rural, instead of agricultural, development becomes the objective.

Not surprisingly, given the fact that ministries of agriculture tend to be among the most traditional organizations in the governments of the low-income countries, these ministries are ill-equipped to deal effectively with agricultural and rural development problems. And equally unsurprisingly, those interested in promoting agricultural and rural development frequently yield to the temptation to circumvent ministries of agriculture to achieve development objectives. Moreover, ingrained tendencies found in all governments, often result in the expropriation of powers which would normally be expected to reside in a ministry of agriculture, by other ministries some of which are traditional and others of which are newly created for the purpose.

As one result, ministries of agriculture have been so greatly denuded of functions that some are little more than paper ministries, inadequately staffed and incapable of producing viable development programs. Another frequent result is that functions affecting agriculture are so widely dispersed among different organizations in a government that coordination is virtually impossible; and because of this dispersion, agricultural and rural development, whatever the expressed wish of the government, actually has a low priority. Sooner or later, this situation almost invariably produces calls for an organizational review and the strengthening of the ministry of agriculture. Thus, a Food and Agriculture Organization of the United Nations "Report to the Government of the Sudan on Organizational and Administrative Arrangements for the Implementation of Agricultural Development Projects" called attention to the

> Need for a detailed examination of the structures and role of the various ministries involved with the agricultural sector (including livestock) with a view to merging some of them or rearranging some of their Departments. The ultimate aim should be to strengthen the Ministry of Agriculture so that it is in a position to play a leading role in agricultural planning and provide essential field services to Project Authorities and farm producers in general. (567, p. 2)

A World Bank Mission to Zaire similarly called for "strengthening of the Ministry of Agriculture, and giving it a larger participation in the establishment of educational, research and price policies...," after finding that "the basic underlying institutional constraint to agricultural development lies in the low priority, dispersed nature, and inadequate staffing of government agencies concerned with agriculture." Another World Bank Mission, this one to Iran, found that the "profusion of ministries and Government agencies serving agriculture" were

acting as a significant impediment to agricultural development in that country." The report of the Mission stated that:

> This plethora of Government agricultural bodies, pursuing different policy objectives and sometimes even diametrically opposed objectives, results in extremely confused and incoherent signals being passed to the farming community...too many agencies dabble in certain activities, while others get overlooked because they fall between several stools.

Yet another World Bank Survey Mission, to Brazil, reported that "the most notable characteristic of the administration of agriculture in Brazil is the great number of agencies which share responsibilities.... The existence of these many agenices, all working in ill-defined" areas produced situations in which policy formulation and enforcement were sometimes hindered. Moreover, because the Minister of Agriculture had no control over some of these agencies and incomplete control over others, "neither the Minister of Agriculture nor any other official can propose a comprehensive agricultural policy based on full knowledge of existing conditions and possibilities." Similar points have been made by others for Mexico (568, p. 105), Sri Lanka (569, p. 16), Malaysia, Colombia (70, pp. 271, 272) and many other countries.

Given the scarce administrative resources and low capacity for coordination among the staffs of agricultural institutions in low-income countries, it stands to reason that the likelihood of failure increases if, instead of concentrating powers in one organization, efforts at agricultural and rural development are split among several agencies, all with their own headquarters and field staffs. This does not mean that all matters affecting agricultural development must be gathered into the confines of a single ministry or agency. For one thing, there are inevitably many policy matters vital to agricultural development which normally are not the concern of a ministry of agriculture alone. Thus, policies affecting prices paid and received by farmers may be the concern of other ministries, especially those for finance, commerce, transport and labor. (196, p. 4) For another thing, the task of dealing with all matters affecting agriculture within one, all-embracing ministry would be far too great a burden for the governments of most low-income countries. (570, p. 148)

What is needed, however, is not so much a super-ministry, but an integrated approach. In agriculture, an integrated approach is especially important in dealing with the farmer because his farm is usually a single unit on which converge the results of the variegated activities of all the institutions working in the field. Thus, while a unit which provides farm credit for development purposes should follow policies and guidelines laid down by a ministry of agriculture which is charged with

planning for a coordinating planned agricultural development, there is no operational reason why it should be a part of the ministry of agriculture. On the contrary, since such a unit is essentially a bank which should operate as efficiently as possible, and with considerable autonomy in judging credit-worthiness of individual farmers, farm groups, projects and programs, there is much to be said for having it lie outside direct civil service regulations and controls.

Much more important than what function is put where is the need to define each function clearly and to assign it to an organization considered appropriate with clearly laid out limits of jurisdiction. Haphazard agglomeration of organizations, frequent shifts in organizational responsibilities, the assumption by some agencies of functions not properly theirs, or unplanned duplication of functions among organizations can produce such an administrative hodge-podge that coordinated movement toward the execution of agricultural development projects and programs is unattainable. Where such a situation exists, heroic efforts may be necessary to disentangle the maze of organizations and functions. But where it is still possible to allocate functions among different organizations in the agricultural sector it is essential that the functions to be carried out by different institutions be adequately studied to insure that their execution will allow each organization to operate within well-defined functional areas.

4. An Agricultural Coordinating Council

Given the probability that many organizations will be working in the field of agricultural development, there is need to set up a single agency or body to plan for and coordinate development policies and activities for the entire sector. Ideally, this agency should be the ministry of agriculture, since most governments look to ministries for sectoral planning and coordination. However, where circumstances in a country make this difficult, it may be desirable to set up an agricultural coordinating council to perform the planning and coordinating functions. Such a council must, if it is to have the necessary influence, be composed of the political heads of all ministries, departments and agencies concerned with agricultural development. It should lay down the basic policies for agricultural development, approve development plans for the sector, and seek to coordinate all activities in the sector, under the supervision of the appropriate governmental authority, be it a cabinet or an individual executive head of government.

Because the members of such a council are almost always busy with many concerns, the council cannot be expected to meet more frequently than once or twice a year. If more frequent meetings are required, an executive committee of the council, composed of

those political heads of ministries, departments and agencies most concerned with agriculture, may be authorized to act for the full council for specific purposes.

To provide technical support for the council, each member of the council could nominate a technician from his ministry, department or agency to a technical inter-agency committee of the council which would meet as often as necessary to do all the technical planning and other work (with the help of subordinates from their respective organizations) required to help the council (or its executive committee) adopt appropriate plans and policies for agricultural development. The technical committee of the council should also be charged with carrying out the coordinative and other functions for the agricultural coordinating council, and for implementing the plans and policies adopted by the council. Because of the importance of these tasks, it is imperative that only high level civil servants -- ideally, the heads of the planning units in the organizations represented or the agricultural coordinating council -- be required to serve on the council's technical committee and that those nominated attend the committee's meetings instead of sending their subordinates. The substitution of lower civil servants on the technical committee is likely to reduce its importance and almost inevitably, given the circumstances existing in most countries, its effectiveness. Because the number of ministries, departments and agencies concerned with agriculture is often large, it may also be necessary to set up one or more executive subcommittees of the technical committee, composed of the technical members from those organizations most concerned with agriculture, or with specific aspects of agricultural development, to carry out for the technical committe specified tasks, including the preparation of plans and programs for the approval of the whole technical committee.

5. Programming Units

An agricultural coordinating council, supported by a technical committee composed of the heads of planning units (hereinafter referred to as programming units to distinguish them from central planning agencies), is well-suited to the task of coordinating all organizations concerned with agricultural development. A technical committee comprising the heads of programming units in all the organizations represented on the committee (as well as its parent body, the agricultural coordinating council), implies the existence of programming units in each of these organizations. Such programming units are imperative for an integrated approach, not only in the agricultural sector as a whole, but within the spheres of activities of each organization.

The programming unit for each organization should be considered for its organization the virtual equivalent of a central planning agency for a national government. It should set standards and criteria for the operating departments or divisions

within the organizations to follow in preparing and carrying out projects; it should prepare the development (or investment) program and the recurrent budget for its organization on the basis of directives from the head of the organization; it should prepare alternative investment policies for the consideration of the head of the organization, after consulting the directors of the operating departments or divisions of its organization; it should set standards for the operating departments or divisions of the organization to follow in reporting on the progress of projects; and on the basis of these and other reports from the operating departments or divisions of the organization, it should prepare regular, timely and reasonably complete reports and evaluations of its organization's overall program; it should coordinate the technical assistance program, if any, for its organization; and it should act as liaison for its organization with the central planning agency of the government, as well as with any other sectoral or subsectoral groups like the inter-agency technical committee of the agricultural coordinating council.

The existence of a network of programming units in organizations concerned with agriculture not only allows the formulation and implementation of an integrated approach for agriculture, but lays the basis for integrating that approach with the planned development of other sectors of an economy through a national development plan. When every organization operating in the agricultural sector has its own programming unit, there is need for an agency to coordinate all the programs of the various organizations. This can be done by the central planning agency, but this is the least desirable way because the central planning agency is normally too far removed from the problems confronting each sector. It is therefore much better to have the coordination done by an organization within the sector. If the ministry of agriculture is recognized by everyone as the senior organization in the sector, it is the logical place for coordination and integration of all subsectoral programs into a unified program for the sector. But if another organization is recognized as the senior one, it can play this role. However, if there is no one recognized senior organization, or if there is a dispute about it, the task of formulating sector programs for agriculture and coordinating their implementation may be carried out ultimately by the agricultural coordinating council and, in its behalf, by the council's technical committee.

6. <u>The Distribution of Functions</u>

Given the vast span of control which would be required of a ministry of agriculture, a division of responsibilities is inevitable. The problem is, where the option exists, to choose an optimum pattern for dividing responsibilities. (196, p. 4) This unavoidably requires detailed study to make sure that the division of responsibilities selected meets the objectives of the country in its particular stage of agricultural development. But there is little doubt that the subject repays study.

Since division of functional responsibilities always introduces problems of coordination, the general bias should be toward retaining in a single organization -- i.e., the ministry of agriculture -- as many related functions as possible, to the extent that this does not result in undue administrative malfunction. It is well to remember that in countries which have gone too far in dispersing functions the major problem confronting them is to bring together in a single institution dispersed functions more than it is to distribute functions.

Perhaps the problem most frequently encountered in developing countries is to determine what to do about a ministry of agriculture which lacks the capability to deal with the functions assigned to it. Sometimes, that capability has been reduced by complex administrative practices which retard decision-making. India has frequently been cited as an example of this problem. (65, pp. 109, 110; 230, pp. 67, 70) Similar comments have been made about the Democratic Republic of the Congo, Zaire, Malawi (231, pp. 131, 132), Ethiopia (231, p. 133) and other African and Latin American countries.

Sometimes, the ministry's low capacity is due to a lack of adequate leadership and staff. Low employee salaries and the continuously shrinking purchasing power of these salaries because of inflation frequently aggravate personnel problems. (553, p. 96) Career opportunities are meagre, which leads to a "brain drain" away from the ministries.

It must be accepted, in these circumstances, that building up the capability of a ministry of agriculture is a long-term affair. In the short term, improvements may be introduced by the use of expatriates in advisory and managerial positions. As a World Bank Sector Mission to Zaire decided, this was a way of buying time until enough Zairans had been trained and had gained the experience needed to run the Ministry of Agriculture in that country.

Training programs tailored to meet specific needs of a ministry's staff also can do much to build up a ministry's capabilities. Here, again, time is needed, although the duration of training periods, where courses have been designed to meet the specific needs of a ministry of agriculture, can be shortened substantially. A judicious mixture of outside assistance and specially-tailored training programs thus can make it possible for a ministry of agriculture to deal effectively with more functions, even in the short run, than it otherwise could. And to the extent that this can be achieved, even though functions sometimes are performed in less than the ideal way (but "good enough" for the time being), it is desirable to retain functions in a ministry of agriculture, if that is where they belong.

In many countries, however, governments have tried to avoid the difficulties found in their ministries of agriculture by organizing new agencies outside the ministries. In Brazil, the tendency to implement agricultural programs through new agencies set up outside the Ministry of Agriculture so reduced the Ministry's functions that one publication compared the Ministry to a tree killed by overpruning. Moreover, the formation of new agencies produced many vertically-organized agencies, each concerned with a special agricultural activity, and frequently overlapping the functions of agencies already in existence. (369, p. 149)

Nevertheless, there are functions which should be dispersed because certain agricultural development tasks can be performed more efficiently and more expeditiously that way. Although there are no hard and fast rules, some kinds of functions are more easily dispersed than others. Among these are a number of services at the fringe of the agricultural sector which, although of interest to agriculture, involve activities of interest to other disciplines and agencies, e.g., higher education in agriculture and agricultural research. In such cases, the activity in question may be, and often is, located in a ministry or agency other than the ministry of agriculture. The same applies to cooperatives, community development, and land reform, responsibility for each of which is often located in ministries other than a ministry of agriculture. (434, p. 22; 196, p. 4)

A second type of dispersion arises when special organizations are created to deal with specific crops. These organizations, whether public or private, may provide services of value and depend for their success in introducing improved production and marketing techniques on a special degree of support from farmers. (434, p. 22) A good example is Colombia, where the respective producers of coffee, sugar, cocoa and cattle each finance their own organization. Each organization provides producers with all the extension, a good deal of the research on the commodity concerned and agricultural education, as well as other services. The Colombian Coffee Producers' Association, the most powerful of these organizations, has engaged in an impressive list of activities which, according to one observer, in Great Britain's Ministry of Overseas Development, "is superior to anything I have yet come across." The outstanding features of the system set up by the Coffee Producers' Association are "direct control by producers at the district level, the integration of extension, credit, and planning, the effective control over research, and the specialist training of extension staff." (402, p. 3) The Kenya Tea Development Authority and Ghana's Grains Development and Cotton Development Boards are examples of agencies in the public sector created to help develop specific crops. (198, pp. 56, 57)

A third type of dispersion involves the establishment of a separate agency for the integrated development of a geographical area or region. (434, p. 22) The Khuzistan Development Authority in Iran, the East Ghor Authority in Jordan, and the Awash Valley Authority in Ethiopia are examples of such agencies. (2, p. 124)

A fourth type of dispersion occurs where responsibility for agriculture, or a part of it, may devolve upon political subdivisions of a central government. Thus, in federal governments like India and Nigeria, primary responsibility for agriculture is within the jurisdiction of the states in each of these countries.

A fifth variety of dispersion seeks to collect in a single agency all the components relating to a specific subsectoral activity of great importance to agriculture, both to minimize the coordination problems created by multiplicity of ministries, departments and agencies which may be concerned with the activity, and to allow better control of the management and administration of the components involved. Water resource use and development, especially in arid countries, is a ready example. Piecemeal water control usually hampers efficient use, as well as water planning and development, while fragmentation of government control leads to waste and slow progress. (7, p. 28) Examples in other fields include Korea's National Agricultural Cooperative Federation, a multipurpose organization providing credit, farm supplies, insurance, and banking and marketing services, which was created by combining an agricultural bank (the Korean Agricultural Bank) and agricultural cooperatives.

A sixth type of dispersion may occur when a separate organization is set up to execute a specific project or program. It sometimes happens that a foreign or international financing body requires that such an organization be created as a condition for a loan. Thus, the World Bank has sometimes required that a government of a developing country create a special entity to execute a project or program it helps finance. In this way, the Bank seeks to assure itself that staff, financial and technical resources, separate from those of operating ministries, are assigned to a project or program. By specifying the qualifications of project or program staff and requiring separate organizations, the Bank aims to increase the probabilities of improving project or program management and successfully completing the project or program covered by the loan. (571, pp. 80, 81)

Whether or not this approach is more desirable than the one generally taken by U.S. Agency for International Development depends on whether one is more concerned with institution building than with the progress of a specific project or program. U.S. Agency for International Development generally encourages existing ministries and agencies to take responsibility for Agency for International Development Projects. (571, pp. 80, 81)

If one is more interested in the successful implementation of a specific project or program than in building up an organization, there is much to be said for the creation of a special agency to implement a project or program.1/ If, for example, an irrigation or land reclamation project is involved, organization of a special, autonomous, agency may be justified on the basis of the considerable investment required. Such an agency may be needed if full utilization of the land covered by the project is to be achieved. If the ministry of agriculture is like many found in developing countries, it is probably overextended without the new project. To turn over new managerial, technical, economic and financial responsibilities may only invite problems too difficult for it to handle. (75, p. 16)

In these circumstances, the creation of a special agency has obvious advantages. It permits the new organization and its new staff to concentrate on the project or program as the first priority without being diverted to other projects and programs. With an independent budget, it has the finances required to do properly the job it has to do. If a staff member is unsatisfactory, dismissal is much easier than in a ministry. Good staff members can be judged by results and promoted on the basis of merit instead of by frequently inflexible civil service regulations. Finally, the specially-created agency is more likely to have competent management, concerned with productivity and cost-effectiveness. (75, p. 16) One can cite examples of such special agencies. Thus, the Kenya Tea Development Authority (KTDA) has demonstrated the importance of having an independent agency to deal with a special program. Since KTDA is a separate statutory organization with its own financing, it is able to take care of its needs quickly and efficiently. KTDA staff do not have to cope with the multitudinous forms or other red tape which often accounts for months of waiting for the simplest request to be processed through ministries in Nairobi. KTDA staff are not faced with the problem, common for other rural extension workers, of lacking vehicles or sufficient gasoline to visit the farmers in their area. As a consequence, KTDA staff have to be able to perform more effectively than staffs in the traditional agricultural ministries and agencies.

But there is another side to the story. Since there is a shortage of trained personnel in most less developed countries, the creation of new agencies frequently has not produced the

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1/ The two objectives are not always harmonized even if they could be; and given the different time horizons which may be required for completion of a project as against the institutionalization of the organization implementing the project, the two objectives may be irreconcilable.

best results. On the one hand, the new agencies may not be able to obtain trained staff because technicians may hesitate to join an agency which has yet to establish a reputation, and which may demand harder work with less security and prestige than does the ministry of agriculture. On the other hand, if the new agency has strong political support and its future seems assured, it may entice most of the best personnel from the ministry of agriculture, leaving that organization less able to do its job, thereby making it more necessary than ever to create new agencies for every new project or program. (75, p. 16) And if new organizations are established too freely, as they sometimes are, the result may only be to disperse agricultural development responsibilities among an increased number of agencies, which not only compete for the limited supply of manpower at the country's disposal, but engage in uncoordinated activities or, worse, in destructive competition. Thus, too narrow a concentration on the execution of individual projects or programs can defeat the effort to build up the ministry of agriculture and other existing agencies to deal effectively with agricultural development. (572, p. 115) The disadvantages inherent in the excessive creation of autonomous organizations is illustrated by Colombia. A World Bank Survey Mission to that country found that the pronounced tendency by the government of that country to create a new agency to deal with each function had unduly diffused governmental powers and made it hard to plan effectively. There were twenty or more agencies, corporations or boards, in addition ot the Ministry of Agriculture, whose activities affected agriculture in one way or another. Under this set-up, it was difficult to plan a coordinated program for agriculture as a whole, determine the proper degree of emphasis to give to different parts of agriculture, establish priorities or provide for a rational allocation of available funds. (572, pp. 271, 272) While there is no practical alternative to setting up new agricultural organizations, given the circumstances in most developing countries, it is well to keep the following principles in mind when a new organization is being considered:

(1) New organizations should be established only when careful examination indicates that the services they are intended to provide cannot be performed by the ministry of agriculture or other existing organizations. (434, p. 31)

(2) Even when need has been established, the creation of new organizations should be spread out over time to insure that competition for limited technical staffs does not get out of hand.

(3) Where there is an established need for a new organization, consideration should be given to making it temporary until the capability of the ministry of agriculture can be improved, in which case the duration of the new organization's separate existence should be clearly limited by the statute which creates it. (434, p. 31)

(4) Whenever a temporary organization has completed the task it was created to do, any continuing agricultural services which it performs should be studied to determine whether it can become part of the normal activities of the ministry of agriculture or another permanent agency. (434, p. 31)

(5) The responsibilities of the new organization should be defined clearly and great care should be taken to avoid wasteful duplication of functions of other organizations. (434, p. 31)

(6) It is wise to start a new organization to carry out one project until it has demonstrated its ability to take on more. (75, p. 16)

(7) Coordination of the new organization's activities with those of the ministry of agriculture should be provided for when the new organization is created. One way of doing this is to make the organization a part of the ministry; another, is to have the head of the new agency report to the minister of agriculture. A third way is to make the minister of agriculture chairman of the new organization's board of directors. Other suitable ways may be worked out with coordination in mind.

C. Organizing the Ministry of Agriculture

1. What Should Be Included in the Ministry

Although the guidelines set out in the preceding section may assist in determining which functions should be retained in a ministry of agriculture and which should be transferred, there is no list of functions or services which can be furnished for inclusion in all ministries of agriculture. It could hardly be otherwise, given the variety of agricultural activities among countries; differences in ecology and climate, national objectives, stage of development; as well as differences in social, cultural political and economic conditions. Indeed, it would be safer to proceed with the assumption that each country must select from the almost infinite variety of possibilities those functions for its ministry of agriculture which meet its unique circumstances at a given time and be prepared to change them if and when circumstances require.

Some useful guidelines have already been laid down. Others can be added. Thus, crops and soils usually form the basis of a ministry of agriculture's concerns, and animal production should be closely integrated with crops in a farming economy. (Animal production is sometimes attached to a different ministry, causing confusion to extension workers as well as splitting the agricultural development effort.) While forestry can be handled by another ministry, forestry's influence on agriculture in matters of soil conservation, watershed development and fuel supplies is usually great enough for it may be included within

the ministry of agriculture. Inland fisheries, as opposed to marine fisheries, can also usefully be attached to the ministry of agriculture. If services for credit, cooperatives and marketing are included in the ministry of agriculture, it should be done so only in the early stages of development. (422, p. 132)

Because there is an intricate interrelationship between the prices of different agricultural products which requires close coordination with credit policy to insure balanced development, the ministry of agriculture also should control the formulation of price and credit policy. Since execution of these policies often involves the resolution of many technical factors, execution of policy need not be a function of the ministry. However, in some countries, execution of price controls are of such importance that it may be considered that they may be carried out by the ministry. (573, p. 54) In some countries, production and marketing boards have been set up as instruments of the ministry of agriculture for the implementation of policy. For example, in Israel, eleven boards cover citrus, vegetables, poultry, peanuts, cotton, beef and mutton, flowers, fruits, milk products, wine grapes and tobacco. The boards carry out a variety of functions. They see to it that supplies of agricultural produce are available for domestic consumption and that prices are kept at reasonable levels for consumers while guaranteeing suitable incomes to farmers. (40, p. 511)

Whether or not irrigation development should be a part of a ministry of agriculture depends on the importance of irrigation in a country's agriculture and economy. A country which depends a great deal on irrigation may need a separate ministry, particularly if irrigation projects involve large-scale mechanization projects. However, if only small-scale mechanization is involved, irrigation might be placed within the ministry of agriculture. (422, p. 132)

Where land problems take on a highly political hue, the organizational structure to deal with them might best be separated from the ministry. But while the separate organization should be concerned with the technical and fact-finding aspects (e.g, the making of cadastral and soil surveys), executive powers to alter the existing situation should normally be retained by the ministry of agriculture. (573, p. 4)

Industries processing agricultural raw materials and, to some extent, industries which serve agriculture often fall between two stools in that the ministry or ministries concerned with industry generally deal with strategic industries while the ministry of agriculture often excludes agro-industry. This situation can be avoided by including in the ministry of agriculture a unit which deals with industries related to agriculture in cooperation with the ministries responsible for industry in general. (174, p. 127)

2. The Ministry's Structure

Since World War II, and especially in the last decade, the trend in developing countries from subsistence to commercial agriculture has been accelerating. Yet, in many countries, the structure of their ministry of agriculture has not been adapted adequately to meet changing conditions. Many ministries of agriculture are survivals from another era. Even if they were suitable structures in their time, they are often unsuited now. They need streamlining and the cutting out of deadwood if they are to respond to the needs of farmers in an era of change. (422, p. 131)

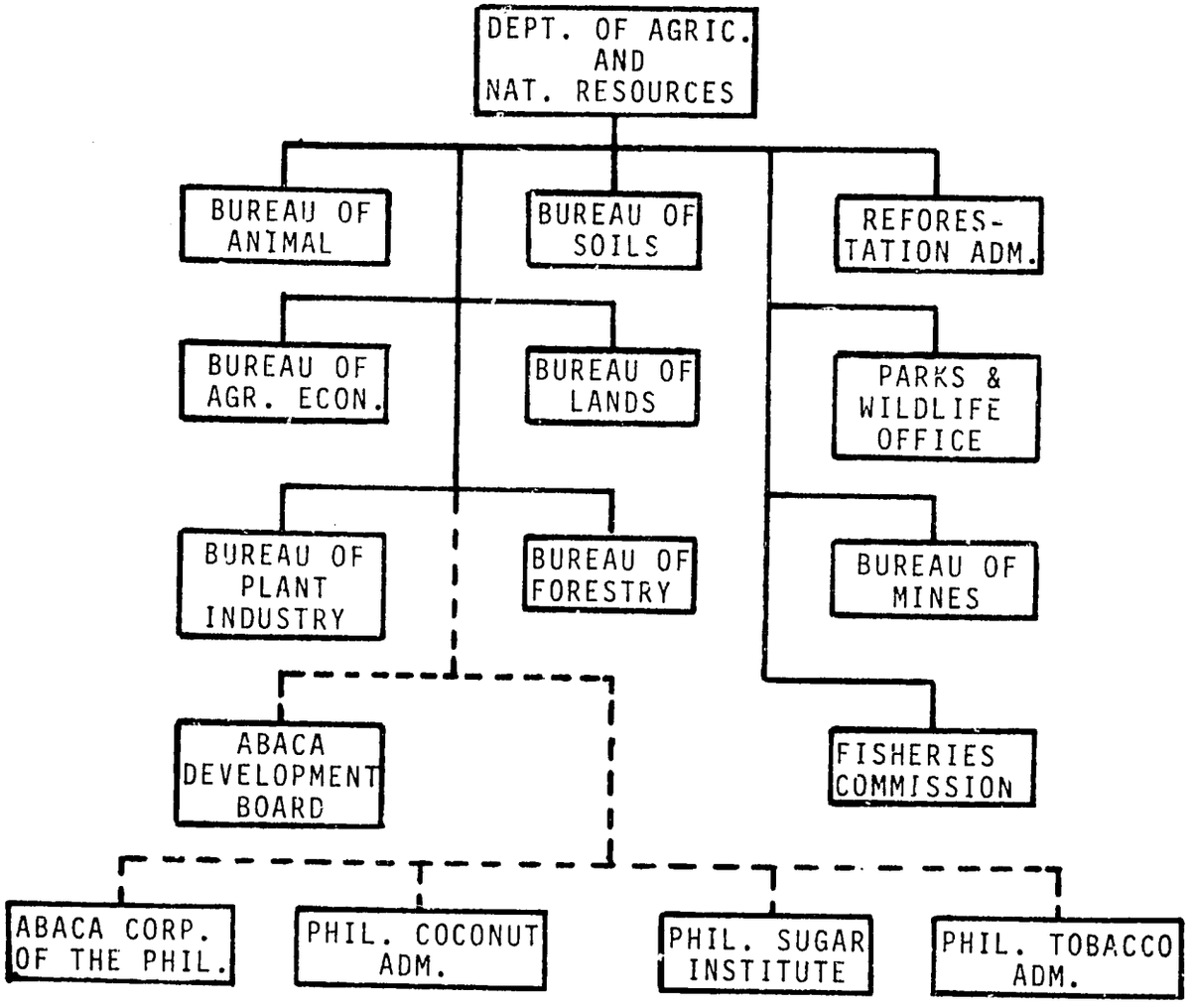
In some countries, the structure of the ministry has evolved over time in a haphazard manner, with the result that coordinated development efforts are difficult to achieve. In Ghana, for example, the Ministry of Agriculture contains many divisions which are virtually autonomous. In order to mitigate the lack of integrated effort among them, an Agricultural Development Coordination Unit was set up to coordinate the technical activities of the various bodies operating under the Ministry. But since the officer in charge of the unit did not rank above other divisional chiefs, he had little power to improve coordination. (198, p. 31)

In many countries, the organization chart of the ministry of agriculture does not portray the prevailing structure and relationships in the ministry. Too often, the organizational chart of the ministry is more impressive on paper than in practice. (570, p. 148) Faulty communications provoke uncertainty about who reports to whom. In some countries, e.g., Ethiopia, some high officials at times went over the heads of intermediate supervisors to give orders and, instructions to these supervisors' subordinates. In contrast, in other countries, administrative habit of long duration insures that no one in the ministry of agriculture will move out of the old chain of command, no matter what new structural and administrative changes have been ordained in an attempt to make operations more flexible. Organization charts must therefore be taken with more than a grain of salt.

There is no one ideal organizational form for a ministry of agriculture. Different ministries have devised different organizational structures, depending on their particular needs and history. Thus, in Colombia, the Ministry of Agriculture has overall responsibility for agricultural policy with very few executive responsibilities. The ministry carries out no extension activities and is responsible for only land reform, research, marketing and resource surveys. Even in these fields, activities are carried out by autonomous agencies to which appointments are made on a political basis. (402, p. 1) In contrast, the Philippines has a ministry (called the Department of Agriculture

and Natural Resources) with a much wider scope of activities. Its organization is therefore more complex:

FIGURE 1



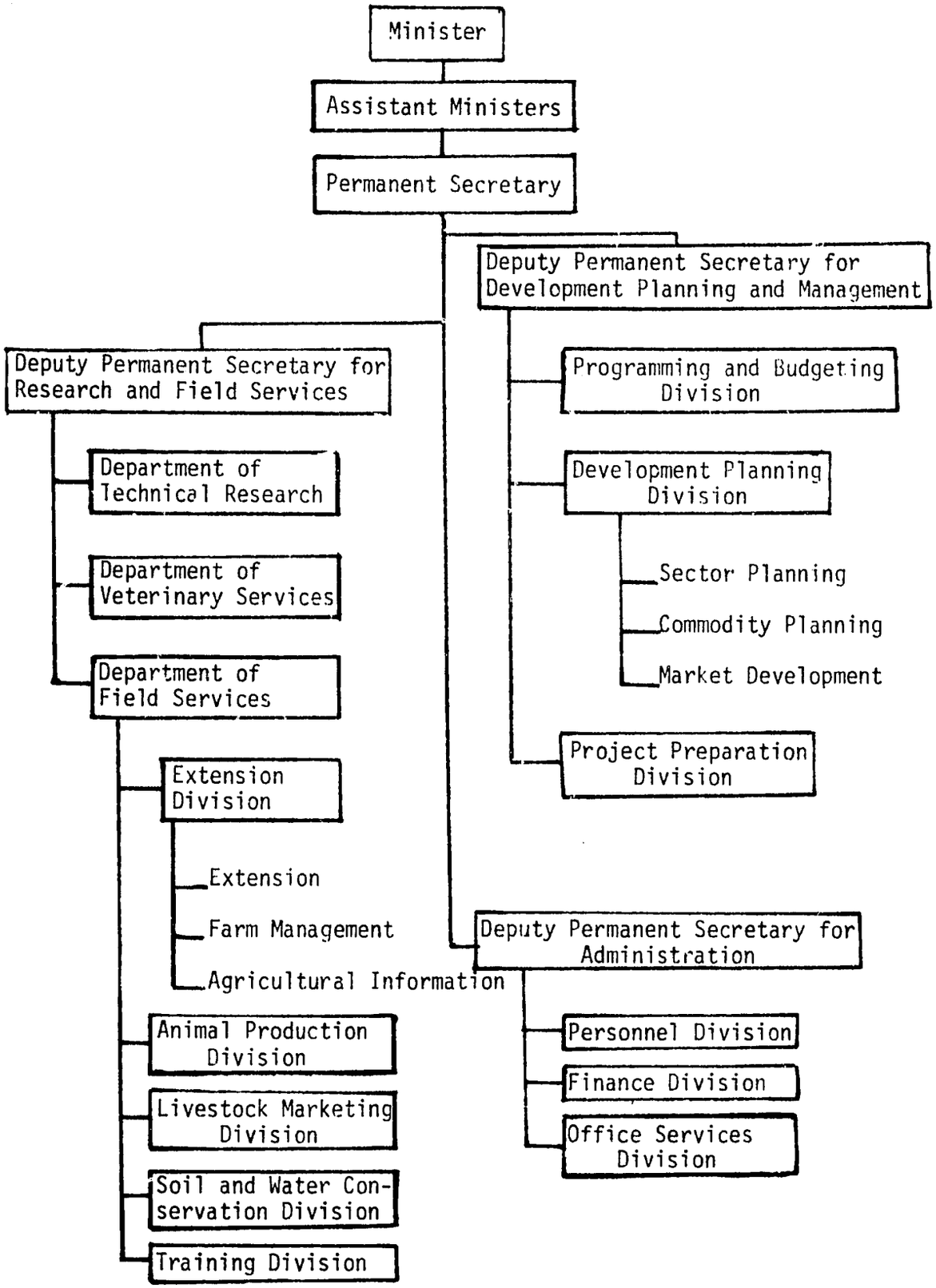
——— Line of Command and Responsibility

– – – Responsibility for Coordination Clearance & Review

For Kenya, a World Bank Agricultural Sector Survey Mission suggested get another organization for the Ministry of Agriculture to meet that country's needs:

FIGURE 2

SUGGESTED ORGANIZATION OF MINISTRY OF AGRICULTURE OF KENYA



Perhaps more important than the form of the organization chart are the functions which a ministry of agriculture should perform, since function should determine form. The functions which a ministry of agriculture should normally perform may be divided into five groups:

(a) Policy, planning and co-ordination;
(b) Research and implementation;
(c) Education and extension work;
(d) Direct services and assistance to producers; and
(e) Enforcement of regulations. (434, p. 5)

Policy, planning and coordination are of particular importance for a ministry of agriculture. These functions require the creation of a policy and planning unit within the ministry. The general outlines of such a unit have already been discussed, but it would be well to stress the particular tasks which such a unit should perform for a ministry of agriculture. These are six in number. First, it should prepare agricultural programs for the ministry. Second, it should assist the technical units of the ministry to prepare and appraise projects in accordance with a set of standards and reporting forms which it formulates with the cooperation of the ministry's technical units.1/

These standards and forms should provide, among other things, for (a) feasibility studies, including cost-benefit analyses; (b) the identification of major "milestones" in executing projects which permit the setting of realistic work schedules and the phasing of projects with related ones; and (c) building into the projects suitable means for determining, on a timely basis, unit and other costs, as well as progress made during execution of projects. (70, p. 567) Third, it should submit and defend the programs it has prepared for agriculture before national planning and budgetary authorities. Fourth, it should recommend policies, instruments of policy, administrative and other measures, as well as machinery, required to implement the programs it prepares. Fifth, it should review and evaluate the progress of the ministry's demand for, and use of, outside technical skills, including consultants and consulting firms. (70, pp. 565, 566)

Because the work of a policy and planning unit transcends organizational lines in a ministry of agriculture, and because it must issue directives to which operating units must conform, it is desirable that the policy and planning unit be established

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1/ It should not prepare or execute projects, since these are functions of the operating units in the ministry. But while each operating unit should prepare and carry out its own projects, the policy and planning unit should be responsible for devising suitable standards and forms for the operating units to use.

as a staff unit headed by an official who has a higher rank than the heads of the operating units. He should report directly to the minister (or the highest civil servant in the ministry) and he should have the confidence of the one to whom he reports.

Because the establishment of a policy and planning unit, and the training of a staff capable of carrying out the various tasks required of such a unit, is no easy matter and may take a year or two to achieve, ministries of agriculture in developing countries have sometimes turned to international agencies for technical assistance. For example, after a report of an Economic Survey Mission to Zambia carried out by the United Nations, the Economic Commission for Africa and the Food and Agruculture Organization recommended the creation of policy and planning units for each ministry in the government, the Ministry of Agriculture sought the assistance of the Food and Agriculture Organization in setting up such a unit in the Ministry. Responding to the request, the Food and Agriculture Organization made available an experienced agricultural economist as planning adviser to the Ministry, and with his assistance the Ministry established an Economic Planning Unit, headed by an Assistant Secretary who reported to the Under Secretary (Planning) of the Ministry. (574, p. 6)

In addition to a policy and planning unit, some ministries of agriculture have found it useful to set up a policy and planning committee within the ministry, composed of the minister as chairman, the head of the policy and planning unit as the vice chairman and as members, senior officials of the ministry, including the heads of each technical unit. The policy and planning committee can be a useful medium in which agricultural policy proposals may be proposed and discussed prior to adoption; and since the heads of the technical units of the ministry often have executive responsibilities for implementing policy, the committee can also provide a useful forum for insuring a coordinated approach in the application of policy, reporting on progress in applying policy, and on the basis of feedback, making such changes in policy or its application as may be required.

In addition to its internal units and committees, it is also desirable for a ministry of agriculture to establish an agricultural advisory council composed of representatives of all important agricultural interests outside the government. The council should have advisory rather than executive functions, and should be convened either regularly or irregularly, as required, to provide a sounding board for, and give advice and counsel on matters of policy, plans or programs which the ministry of agriculture is considering. It should also be an educational medium, and be called upon to cooperate in disseminating information about adopted policies, plans and programs. While the membership of the council should include all the most important representatives of agricultural commodity and regional interests

in the country, it should not be so large as to be ineffective. If the number of representatives on the council are likely to be so large as to make it unwieldy, it might be best to supplement the council with advisory committees with individual problems affecting research, credit, marketing, water control, etc., which could report their recommendations to the whole council or, if considered desirable, directly to the ministry. The policy and planning unit should be the secretariat for the agricultural advisory council and for other advisory committees which are established. The head of the policy and planning unit should be the secretary of the agricultural advisory council; and other members of the policy and planning unit, as designated by the head, should act as secretaries to the different individual advisory committees. (70, p. 569)

In the last analysis, the effectiveness of a ministry of agriculture depends on its strength in the field. In setting up the ministry, it is well to bear this in mind. There should, of course, be close liaison between headquarters and the staff of the ministry at regional, subregional and local levels. High headquarters officials should visit regional and subregional areas periodically to learn at first hand the problems which need to be resolved and the obstructions to progress which need to be overcome. These visits should be more than inspections; they should be seen as opportunities to assist and encourage the field staff, improve conditions of work, cultivate team spirit, and build up the staff's enthusiasm and morale. It is also useful to have annual or even more frequent conferences of regional and subregional staff at headquarters. (575, p. 112)

But perhaps most important, headquarters officials should undergo training in the principles of open management to orient them toward bringing field staff into active participation in the planning process. Too often, field staffs have a far greater capacity for good work than their superiors in the ministry of agriculture assume; too often, the field situation is often greatly misperceived from above and too often, these superiors do not understand that participation by even the lowliest field staff in planning their work and setting their work targets has considerable potential for improved performance. (177) India is an example. In that country's government administration, agricultural plans and policies were made at the top of the official hierarchy with little participation by men in the field. After the plans were drawn up, orders were passed down and the field staff was expected to show results. Since these orders made no allowance for difficulties in the field, and often had no logical relationship to the local situation, field workers found it difficult to achieve the targets set for them. Faced with a threat to their security, field workers took recourse to manipulating records and making exaggerated claims. Actual achievements became of secondary importance to satisfaction of superiors at headquarters, who did not bother to follow up on programs in the field. Since

the field staff had to employ considerable ingenuity and effort to satisfy superiors, it is likely that a similar expenditure of imagination and time on improving agriculture would have been far more productive for the rural economy. As it was, according to one knowledgeable contemporary observer, "It is fair to say that no reliable and profitable functioning relationships has been established between the farmers and [government agricultural] agencies." (430, pp. 61. 62)

In setting up the field services of the ministry, it is better to start with the situation in the field and first build up the kind of staff needed in adequate numbers to deal with field problems, rather than to start with the headquarters staff and build outward to the field. Too often, when the ministry's structure has been set up from headquarters outward, an imposing array of officials, sitting at headquarters, keep in touch with the field staff only by corresponding by mail with an inadequate number of staff in the field. As between headquarters and field staffs, therefore, the primary effort should be to build up an adequate number of effective field operatives, with headquarters staff being added as the need for greater headquarters support for the field staff becomes apparent. (422, p. 133)

D. Regional, Subregional and Local Organization

It should be obvious that no one can sit in the capital of a country and carry out, or even formulate, plans for agricultural development. But what should be obvious is not always apparent. One reason for this is that one can find examples of centrally-formulated plans which have been implemented. Thus, comprehensive planning for Egypt's agriculture started with the centrally-conceived and administered First Agricultural Five-Year Plan for 1960-1965. Because it was successfully implemented, subsequent agricultural planning continued to be centralized. The planners contended that centralized agricultural planning was essential in Egypt because agricultural expansion depended on public spending and governmental initiative. (167, p. 5) But centralized agricultural planning in Egypt turned out to have only short-term success.

Soviet agriculture has long been hobbled by Moscow's attempts to impose throughout the country farm methods or crop patterns which happened to strike a political leader's fancy. Thus, the grasslands system of crop was made mandatory under Stalin. Then it was ordered abolished, again everywhere; corn, which Khruschev called "the queen of the fields", had to be grown throughout the Soviet Union. More recently, new state supervising agencies have sought to impose centralized and regimented controls over collective and state farms. (577, pp. E1, E7)

Centralized control over agricultural and rural development has proved to be unworkable in most less developed countries for a number of reasons. For one thing, national planners tend to give priority to national rather than local objectives and to allocate available resources accordingly. Because of this, it would be more accurate, perhaps, to say that planners plan "upon" the local people instead of "for" them. Even when they wish to take local conditions into account, national planners seldom possess enough knowledge about local conditions and farmers' needs to prepare and carry out plans, programs and projects at the local level. Sometimes, national planners have been exposed to local conditions before they went to the capital. In that event, it is easy for them to get out of touch with problems as the local people see them. (275, p. 676)

Not only is it necessary to see local problems as local people see them; it is essential that local people be made to feel that local plans, programs and projects are "ours" instead of "theirs." Unless they have this feeling they will exert little effort to implement plans, programs and projects; and the only sure-fire way of making local people feel that a plan, program or project is "ours" instead of "theirs" is to make it so in fact.

To insure the greatest possible input of local knowledge, as well as to promote the identification of local interest with plans, programs and projects, ways should be sought to obtain local participation in the planning process, however small may be the contribution at first. But, to the greatest extent possible, plans, programs and projects should be drafted by those who are to be responsible for their implementation. While technicians and planners should contribute judgments for incorporation into plans, programs and projects, these judgments should not replace or radically modify the views of local people. (46, p. 96) This requires that planners present the elements of the planning process in ways which local people can understand and use to achieve their own ends. (578, p. 62)

Planners would do well to keep in mind that agriculture is an enormously variable production and distribution process, requiring minute local adjustments within narrow timing tolerances. Generally, farmers and other local people make these timing decisions and adjustments better than anyone else; and they will make them only if flexible ways are devised to make it worthwhile for them to do so. (30, p. 9)

Neglect of local input has almost always had an unfavorable effect on the performance of agricultural and rural development efforts. (231, p. 150) In contrast, farmer participation often accelerates growth of output and development. For example, agricultural price stabilization and support programs will usually be more effective if farmers themselves play an active

role in carrying them out. Governments should therefore seek ways of getting farmers themselves to take appropriate steps which, by promoting the adoption of improved farming techniques, better methods of farm management and improved marketing methods, contribute toward the achievement of a stable and efficient agriculture. (264, p. 9)

To achieve this, or to get an accurate picture of rural conditions, needs and potentials, requires that effective means be established for communicating farmers' views to planners. Regrettably, most developing countries still need to find ways of bridging the often considerable gap between the views and needs of national planners and those of farmers. In rural Taiwan, thanks to an extraordinarily effective system of administrative controls established by the Japanese colonial administration as long ago as 1900, the Government has found it possible to bridge that gap.1/

But for most countries, it is manifestly impossible for central planners in a government to deal directly with multitudes of farmers scattered throughout a country. Even in Taiwan, the Government would not find it desirable or possible to advise each farmer directly, or to deliver fertilizer, tools or equipment to his door. (563, p. 119)

Occasional contacts between government officials and farmers must be continual. An additional factor which must be borne in mind is that farmers are usually able to provide government officials and planners with a clear picture of their common needs and views only after they have an opportunity to deliberate on, and discuss, their ideas among themselves. (46, p. 68) While central ministries and agencies can do much through their field staffs to insure the free flow of information upward and downward, as well as to provide incentives and opportunities to farmers to improve production and marketing practices, these entities are usually inadequate for use by farmers to arrive at collective decisions after due deliberation and discussion. For this purpose, entities designed to work in close proximity to farmers, or, better still, entities which are composed largely, if not completely, of farmers are

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1/ Because detailed and accurate land records exist, the Government has been able to make suitable allocations of fertilizer to every small plot of land and to collect taxes and irrigation fees on all land. Census data cover the entire population and all persons are registered. Postal service goes to every household, and in a variety of other ways the administrative system reaches directly every individual, household, and square meter of land (340, p.114)

likely to be more effective. (90, p. 100) As the President of the World Bank has pointed out, what is needed is:

> the organization of local farm groups, which will service millions of farmers at low cost, and the creation of intermediate institutions through which governments and commercial institutions can provide the necessary technical assistance and financial resources for them. (579, pp. 315-316)

But this is easier said than done. One of the hardest tasks of administration in developing countries is the creation of organizations which can respond flexibly to local attitudes and changes in local situations and provide means of conveying to central government entities and officials accurate and timely information about these attitudes and changes. (563, p.119) Governments which have succeeded in creating such organizations have done so, not by applying a pre-conceived formula, but by adapting organizational principles to locally-accepted administrative and behavioral modes.

Such an approach was used in Kenya's Smallholders Tea Project. A hierarchy of committees was set up in conformity with existing local and regional administrative units, and with a membership composed of farmers and government officials, a customary system in Kenya. At the lowest (divisional) level, each area where tea is grown was represented on a Divisional Tea Committee by at least two members elected by the local tea growers. The Divisional Tea Committee also included a government official, the Divisional Assistant Agricultural Officer, plus several co-opted members. Each Divisional Tea Committee elected at least two of its grower members to represent it on the next higher level District Tea Committee, established for each District where tea was grown. The District Agricultual Officer, the District Tea Officer, and the District Leaf Officer usually were also represented on this Committee.

At the Provincial level, a Provincial Tea Committee composed of two elected growers from each District Tea Committee, the Provincial Agricultural Officer, a Tea Officer, and a Leaf Officer from the Province were appointed by the Kenya Tea Development Authority (KTDA), the organization charged by the Government of Kenya with the development of the country's tea industry, and a representative from each Tea Factory Company. The Provincial Senior Tea Officer and a representative of the Provincial Administration were also frequently invited to attend meetings. Finally, the grower representatives on the KTDA Board were elected from among the members of the Provincial Tea Committees.

Although the tea committees played only an advisory role, they proved to be an important part of the KTDA administrative

structure and operations. Not only did the committees provide KTDA's head office and its staff at various administrative levels with information on specific problems of rural areas; they also provided the smallholders themselves with opportunities for discussing amongst themselves their problems and choosing solutions to them. The committees also made the smallholders feel that KTDA was really concerned about their views. In return, the committees sometimes made it possible for KTDA to win growers' acceptance for what started out as an unpopular policy.

Other countries use other kinds of organizations to the same ends. These have been called by a variety of names: production teams, farmers' clubs or associations, cooperatives, kibutzim, moshavim, panchayats, village development committees, self-help groups, etc. (563, p. 119) In each country, what matters most is not so much the name or form of the organization as the extent of government commitment to whatever kind exists.

However, if this criterion is used as a test, the outlook is not promising for the development of agriculture and rural areas in most parts of the world. For local government and field services of ministries of agriculture and other organizations concerned with agricultural and rural development are typically the most neglected parts of the public sector in low-income countries. Local governments and field services are usually resource-poor, tradition-bound, and talent-starved.1/ In these circumstances, it is difficult to envisage these entities as catlytic agents for the acceptance of new ideas, stimulation of local action, and mobilization of resources for development. (425, p. 61)

Moreover, the environment in which local governments and field services function is often unpromising. This environment not only makes these jurisdictions and services unlikely agents of change; it also provides few incentives for farmers to increase or improve production. (425, p. 61; 4, p. 99) When farmers have little incentive to cooperate in implementation of development plans, programs and projects depending ultimately on the efforts made and risks taken by farmers cannot be expected to succeed. (4, p. 110)

Creation of effective units of local government and field services of central ministries and agencies concerned with

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1/ The contrast with Taiwan is striking. In that country, the Government has taken great pains to make certain that public and other associations at local and regional levels are adequately staffed. (340, p. 115)

agricultural and rural development therefore is bound to be a difficult and time-consuming task. This is all the more so if local governments and field services are expected to develop farmers' organizations with broadly-based participation of their members. Yet, given the special problems of agricultural and rural development in low-income countries, success in building up such participation may well be the key factor in reaching development objectives. (127, p. 394) The difficulty of developing such participation has often been the rock on which agricultural and rural development plans, programs and projects have foundered.

The need for effective local government organization and field staffs of central ministries is clear in the case of extension services to farmers, or for the establishment of improved farm credit and marketing systems. Although less obvious, it is usually no less essential for price stabilization and agrarian reform programs. Even large public investment programs and projects for agriculture may require an extensive local organization and staff, e.g., to arrange for the construction of feeder channels to carry irrigation water to individual farms. (4, p. 133)

Governments often have been slow to recognize the need for participative farmers' groups. Until experience demonstrated that farmers are much less likely to cooperate with plans, programs and projects prepared for them by central governments than when the farmers participate actively in preparing the plans, programs or projects, governments were loathe to delegate authority to local farm groups. (4, p. 110) One can still find governments which claim that they can, with detailed central planning, convince farmers that the central planners know best what is good for them. In these countries, planners may talk with farmers' representatives, or even conduct systematic interviews or inquiries among representative farmers who may provide much valuable insight into farmers' likely reaction to proposed projects, programs or measures. (235, p. 172)

Nicaragua uses this approach, reportedly with some success, but the number of governments which have achieved satisfactory results in this way is dwindling. The best that can be said for this approach is that at least it represents progress from the time, not many years past, when governments believed that they could achieve satisfactory results through the exercise of coercion over farmers. (73, p. 574) To an increasing number of governments it has become clear that the best results are obtained from procedures which associate farmers with the formulation as well as the implementation process at the local level. (235, p. 172)

Since effectively functioning farmers' organizations can be of great value in implementing agricultural development

programs, it is worth considering some of the conditions which make for their success. While organizations run by the farmers themselves are likely to be best for expressing members' views and for making farmers feel that the organizations are their own, it is not easy to create these organizations. One reason for this is that in stagnant rural societies, these institutions usually do not come into existence except as a result of state policy and initiative. Government officials generally must propagate the idea among farmers, start the organizations and guide them after they have been created.1/ And experience shows that it is difficult to do these things in such a way that out of the planning and instigation from above comes a surge of movement from below, strong enough to give the institutions an independent life. Yet this is what must be done. (581, p. 8)

One way of promoting the establishment and growth of producers' organizations is to provide them with credit. A great deal also depends on the use which a government makes of these organizations. If it endows them with significant functions, it can provide them with the status and income they need to make them viable. If, for example, the government designates farmers' associations as agencies for distributing fertilizers, seed and other farm inputs, or as official agencies for buying farm products, it not only provides them with status and important functions, but also assures them a regular source of income. Such advantages may be decisive in less developed countries, where small, struggling farmers' associations often find it hard to compete with private traders who sometimes possess greater resources than are available to farmers. (4, p.136)

In Taiwan, for instance, the Government guaranteed farmers' associations a certain income by providing them with a fixed percentage of local tax collections and by appointing them as distributors of fertilizers. While this did not make the farmers' associations rich, it made it possible for them to operate effectively by providing them with a sufficiently strong financial foundation to engage competent staffs. (340, p. 116) However, the provision of government resources also runs the risk of making producers' associations no more than government agencies, with the result that farmers may hesitate to make known their true feelings, for fear of reprisal. This can be avoided only if the organizations are permitted a great deal of autonomy in their operations. (4, p.136)

1/ In Tanzania, it is TANU, the Government Party, rather than the Government itself, which takes the leading role. The civil service also participates in the process, but government officials are usually subordinate to TANU officials. (580, p. 12)

This conclusion is also relevant for Mainland China. That country has many organizational problems similar to those in mixed-economy countries. In China, producers' cooperatives have given way since 1962 to production teams, which have about half as many farmers as the producers' cooperatives had. Production teams were selected as the basic unit of organization in Chinese agriculture because they were found to be large enough to make the management of a unit of land viable, and small enough not to stretch very much the connection between individual rewards and work. The effectiveness of the production team as the basic agricultural unit and the organizational stability in agriculture, along with increased use of modern inputs, go a long way toward explaining the steady growth of agricultural production in China since 1963. (68, p. 57)

The members of a production team elect their own leaders (including the head, accountant, treasurer and watchman) for a one-year term at a general meeting. When election time approaches, the team members draw up a list of potential candidates. The work brigade, a higher level organization of farmers which has jurisdiction over a series of production teams, uses the teams' list to prepare nominees. The work brigade may nominate seven people for four posts. Members of the production team then each have four votes. The four top vote getters become the team's leaders and decide among themselves who will have which job. (219, p. 99)

Production teams hold general meetings of all adult members about once every month to make major decisions, e.g., approval of the production plan; determination of a system for distribution; determination of the amount of income that should be devoted to investment and welfare; selection of the kinds of investments that should be made; and examination of all expenses. These meetings tend to be free and democratic. Not surprisingly, however, a core group of leaders (the team's management committee) often discusses matters beforehand and comes to the meetings with proposals. These are often approved with little discussion, but their proposals are sometimes rejected. (219, p. 98) While local Communist Party leaders play an important role in harmonizing the goals of the production teams with the goals of the Government, production teams have enough autonomy to allow members a considerable voice in the team's activities. In this sense, the Government appears to have realized the importance of permitting team members to exercise a considerable participative role in local decision-making. (219, p. 123, 124)

1. Cooperatives

The term "cooperative organization" covers a wide range of institutions, as different as the Soviet kolkhoz, the Israeli kibbutz, and the Mexican ejido. The term may also be

applied to independent producers anywhere who associate themselves voluntarily to obtain benefits from group provision of farm inputs, marketing farm products, or storing and financing farm products. In Western countries, such cooperatives, usually based on small family farms, have enabled farmers to benefit from modern technical developments in agriculture through the establishment of a common basis for marketing, supplying agricultural machinery, and providing services of various kinds to its membership. The cooperative, whether it consists of small farmers or a large collective settlement, acts as a link between local initiative and national plans, programs or policies. Regional or national cooperative unions which include a number of cooperatives have been found to be effective in securing the interests of farmers by defending their interests vis-à-vis a government. (40, pp. 504, 505)

In countries where cooperatives are prominent in agriculture, the cooperatives have proved to be such efficient tools for implementing national agricultural policy that many agricultural experts have become strong advocates of the cooperative form of organization for less developed countries. The situations in Denmark and the Netherlands, two countries with highly efficient agriculture, are frequently given as examples of what cooperatives can achieve. The Israeli experience has also been cited for providing "food for thought on the efficiency of agricultural planning based on general agricultural cooperative unions." The Israeli authors of one work contend that "we shall not be exaggerating if we say that the rapid transition from a primitive to a modern agriculture [in Israel] was due greatly to cooperative organizations." (40, pp. 503, 504) In Korea, a highly developed system of farmer cooperatives has enabled the Government to carry out successful programs for supporting prices of farm products, distributing fertilizer and other inputs required to expand crop and livestock production, and increasing commercial marketings of agricultural products.

Farmer associations in Taiwan, which some purists might claim are only quasi-cooperative arrangements because of the Government's involvement, fulfill members' needs from the cradle to the grave. These organizations, besides being concerned with credit, marketing, farm input supplies, joint utilization of equipment and facilities, processing of commodities, and insurance, also deal with members' education, family guidance, health clinics, child care nurseries, weddings, and even furnish members with cars for funerals. (582, p. 6)

There is little question that cooperatives have been successful in certain technical situations (e.g., for export crops marketed by a monopoly), in sharing certain common facilities (e.g., irrigation and storage), and in certain social situations (e.g., where managerial capacity is fairly well developed).

But there is also evidence of failure (e.g., in cases where crops were sold in competition with merchants in local markets; where members of cooperatives had little managerial skill; or where single-purpose--like credit--was the sole objective of a cooperative).

Because of the failures, there is a good case for paying attention to past experience before embarking on the establishment of cooperatives in a developing country. There is need to distinguish between situations where farmers still have a high degree of dependence and situations where they are self-reliant. (561, pp. 244, 245) Thus, while farmers in India often have shown themselves slow to act on their own, those in Japan accepted independence easily. Among the elements which made agricultural cooperatives successful in Taiwan was the all-encompassing nature of these organizations, so that membership was virtually a pre-requisite to farming. There was also a long tradition of cooperative effort in Taiwan. (582, p. 6)

Another factor to which attention must be paid is the character of the leadership in farm communities. If the leaders are large and rich farmers and moneylenders, as was true in India, cooperatives cannot be expected to serve small and poor farmers. Leadership in a cooperative set up for small farmers must come from the small farmers. The experience of the Comilla Project demonstrated that good leadership can emerge from small farmers and that this leadership can be trained to improve the quality of cooperative efforts in agriculture.

Finally, the type of cooperative organization established must fit the members. Since people from one country or region are not necessarily like those of another, different kinds of organizations may be needed for different places. Where, as in Bangladesh, the people in a locality are likely to be generally similar, the kind of cooperative which will work well there is likely to differ from one where, as in Israel, cooperation must be based on pluralism. (40, p. 504) The problems or constraints affecting cooperative organization must therefore be thought through in the context of the local situation by those involved. Foreign models or methods, developed and designed for a different environment, can rarely be transplanted directly. While foreign expertise can play a useful role in bringing the experience of other parts of the world to bear on the problems of cooperative organization in a particular country, that experience must be considered only one factor in what must be essentially an adaptation of many factors to a local situation. (56, p. 4)

2. <u>The Devolution Problem</u>

Much has been made in recent years of the desirability of "democratic decentralization" of activities associated with agricultural and rural development. There are cogent reasons

which can be given in support of this point of view. The chief argument is that development activities must be varied to fit different conditions in different localities in a country. Since much knowledge of a local situation can be lost in transmission to higher levels, it may be best to have those in each area who have intimate knowledge of local conditions act directly on that information. Moreover, since local situations change, whether from the effect of weather, the influence of the development process, or from other factors, there is frequent need to modify programs and plans. These modifications may require not only detailed knowledge of a local situation, but also prompt and appropriate action, something hard to come by when the decision-making apparatus is concentrated in the capital of a country. (127, p. 390)

Nor is the situation always improved when ministries have field staff in local areas. In Iran, for example, it simply is not always possible to get agreement among representatives of different ministries even in Teheran, where their superiors and colleagues are available for consultation about proposals; accordingly, it is likely to be even harder to obtain agreement from a provincial or local center. In these circumstances, it may be desirable to give local people authority to act, even when their administrative competence is less than perfect. There is something to be said for the point of view that "ten decisions quickly taken, of which three are 'wrong,' may well be more productive than ten references to committees or higher authority, taking three months before answers come." (563, p. 119)

Having said this, even someone partial to "democratic decentralization" must concede that the devolution of authority to regional and local levels cannot be made lightly. Premature or excessive decentralization can be harmful and wasteful if the devolution of functions is made to jurisdictions that lack the personnel and funds to perform those functions. (425, p. 64) India attempted to decentralize authority for its well and tank irrigation program from the time of the First Plan period starting in 1947, although the country lacked the middle- and lower-level administrators needed to mount an effective program. (49, p. 44) While progress was recorded with each successive plan, a report of the Fourth National Convention of the All-India Panchayati Raj, held in Bangalore in 1964 stated that:

> The progress of the movement of democratic decentralization is painfully slow and there has been a lack of promptitude in the implementation of plans. Lukewarm interest shown by the people . . . poor leadership . . lack of self-reliance and increasing dependence on State Governments, bickerings and factionalism, corruption and manipulation of accounts . . . and lack

> of guidance from superior authorities . . . are some of the causes explaining the unsatisfactory state of affairs. (49, p. 78)

Clearly, there are circumstances when it may be fruitless or dangerous to devolve substantial operations to local organizations before they are technically and managerially equipped to take on new responsibility. (425, p. 64)

But decentralization need not be an all-or-nothing proposition. It should be seen as a matter of kinds and degrees. It can be extended gradually and at different rates to different localities as circumstances warrant. An example of this is found in Taiwan, where Irrigation Associations were established with the number of members ranging from only 632 to as many as 334,000, and the number of hectares ranging from only 2,457 to 150,674, according to the size of the catchment area involved. In these circumstances, it was necessary to be selective among the different Associations in delegating authority over the execution of different tasks. (576, pp. 76, 77)

A question sometimes arises concerning the level to which agricultural or rural development tasks should be decentralized. Some experts used to feel that decentralization should go as far as possible. Thus, in India, agricultural and community development programs took as their focal point the village, whose average population amounted to only about 750 persons. In that country, it was neither technically feasible nor economically advantageous, however, for the Government to deal with each of about 500,000 villages. (583, p. 110) By contrast, the cooperative program in the Comilla Project was based on small villages where 100 percent face-to-face management by all members of the village was possible.

While the Comilla experience may seem to contradict the Indian experience, there is much evidence that larger units can be just as successful. Thus, impressive progress was made in the Mymensingh District (which, like Comilla, was in what was then East Pakistan), based on the local Basic Democracy unit which contained about 10 villages. (43, p. 160) It therefore seems that there is no standard answer concerning the appropriate level to which decentralization should be carried in a given country. What can be said is that it should not be carried beyond the capacity of a government to deal effectively with it or below what is economically desirable. (For a further discussion of this issue, see the Farmer Organization section of the chapter on Extention and Research.)

In determining the desirability of delegating authority to local bodies, it is also necessary to remember that some rural development tasks are better handled at higher levels and some at lower levels. Thus, centralized operations are

generally required the more complex the technology involved, the more capital-intensive it is, the slower the payoff or return, or the more specialized and scarce the technical and managerial skills involved. In contrast, the more commonplace the technology, the more people involved, the simpler the management skills required, the more quickly results can be achieved, the more local "feedback" is required to guide operations, the stronger is the case for decentralization. (583, p. 75) It is not always possible to identify which activities should always be carried out locally, but there are some that obviously fit into this category. Thus, four activities which are so dependent on local conditions and on each other that they need close coordination in each locality are: (1) the availability of farm supplies and equipment; (2) local testing of these inputs; (3) extension education; and (4) production credit. (102, p. 177)

In countries where local communities have limited ability to assume responsibilities, but where devolution is seen as desirable, decentralization might be made more effective if it is controlled rather than complete. This could also be true for jurisdictions where there is reason to expect that abuses of power, misappropriation of resources, or even honest mistakes may occur. In these instances, effective decentralization can be constrained by firm policy guidelines and centrally established standards enforced by periodic inspections and other forms of audit and control, while leaving operations in the hands of locally based personnel. A rural electrification project in the Indian State of Rajasthan provides evidence and support for the fact that controlled decentralization can be economically and politically productive. (576, p. 76)

China uses a unique approach, a "responsibility" or "guarantee" system (pao-kan chihtu) to provide a mixture of control and decentralization that apparently works. A local unit (it may be farmers in a village or another kind of group) guarantees performance in a specific sphere to authorities at the level immediately above, in return for which the local unit is allowed wide latitude in carrying out its operations without interference from higher authority. So long as the unit fulfills its obligations, it is free to carry out its operations as it wishes. Although this "responsibility system" is a deeply-rooted tradition in China, it may be adaptable in other less developed countries as a workable arrangement where direct administration down to the grassroots is impossible or undesirable. (559, p. 130)

Decentralization goes beyond the mere delegation of power; rather, it involves a transfer of power from the center to the field or local authorities. In practice, however, what passes for decentralization in many countries where governments or

central ministries profess to follow a decentralization policy is a partial or temporary delegation of power from the center, with the final authority over the way the powers are exercised remaining firmly at the center.

In Zambia, decentralization has been called "a shadow and beneath that shadow, authority is little less decentralized than it was before the 1969 reforms. . . . There has been some decentralization of the day-to-day control of minor operations but decision-making powers are, in the main, as closely vested in Lusaka [the capital] as they were before." (562, p. 27) In Kenya, according to observers of the decentralization effort there, devolution of authority has not resulted in changes in the center's attitude toward the exercise of power. (231, p. 150) According to a report on Kenya written for the U.S. Agency for International Development, Nairobi's control of planning and funding approval allows local level officials few opportunities to initiate new activities to meet specific local needs. (63, p. D-6) In India, many field officers feel that, despite the decentralization policy of that country's government, field officers "do not participate in planning and decision-making for their areas." (65, p. 112) In some countries, bickering and bureaucratic infighting between the center and field staffs or local government units prevents effective action at local levels. During the time of the Basic Democracies in Pakistan, the period "was characterized by an administrative struggle" which boiled down to "a conflict between centralization and district autonomy." (584, p. 53)

In such circumstances, "decentralization" cannot be expected to work well. Decentralization of powers can only work well when the powers to be decentralized have indeed been transferred. (562, p. 3) Often, when powers merely have been delegated rather than transferred (which is what decentralization means), staff qualified to carry out these powers are retained in the center--to the detriment of local areas which usually do not have well-trained personnel qualified to exercise the powers presumably turned over to them. In Ghana, attempts by the Ministry of Agriculture to decentralize budget preparation were a failure because of the lack of staff at regional levels. (416, p. 32) Without a staff of real calibre, a decentralized system cannot work well. (562, p. 3)

The point needs to be stressed, finally, that decentralization does not involve the devolution of <u>all</u> powers from the center--only those which the center wishes to yield--and it never involves a devolution of power over policy, which must continue to be decided at the center. (562, p. 3)

E. <u>The Need for Communication</u>

If local needs are to be met, both local and central organizations must work together toward joint objectives. Instead

of cooperation, however, there is often a tendency for the two to work in isolation, without effective communication or understanding between them. Central authorities pursue their objectives without adequately informing local authorities, while local authorities follow their objectives independently, often at odds with central plans and efforts. (425, p. 64) Communication between localities is even worse. There are things being done in one locality which are unknown thirty miles away, because different people are in charge or because a mountain lies in between. To find, support, link and expand these initiatives involves the establishment of lines of communication which are difficult to create. (43, p. 205)

1. Communications in the Official Sector

There are two parts to the communication problem. The first involves communication within the government sector; the second involves communication between the public and private sectors. Within the public sector, a host of factors can impede communication; some of these have already been mentioned. Improved communication between the center and the field has been seen to involve a degree of trust, a delegation of financial and other powers which is often appallingly difficult to extract from officials in the capital. (43, p. 205) Directives usually move from higher to lower units in the hierarchy, but the flow of information in the reverse direction is not equally provided for. Within bureaucracies, status is often a strong barrier to the flow of information from lower to higher levels. Many officials at the upper levels do not have sufficient tolerance for suggestions coming from those below. (484, p. 136)

Other obstacles to easy communication within the official sector may arise because of the form which bureaucracies take. For example, in civil services which distinguish between "generalist" administrators and technicians, good communications depend on close collaboration between the two. In India and elsewhere, where a distinction between generalists and technicians is made, communication between them often becomes difficult. The traditional structure of administration in these countries is highly compartmentalized. Each department has a distinct line of command. Inter-departmental links are few. (484, p. 137) As a result, the weakest linkages are the "diagonal" ones, i.e., between officials in different departments and at different levels. (230, p. 101)

Yet another impediment to the free flow of timely information may be found in the systems used to communicate. In India, for example, members of different departments are often close enough to communicate with each other by meetings or by personal contact. But the preferred method is writing--accompanied by the movement of files from office to office and from level to level. This procedure has proved to be cumbersome,

time-consuming and inefficient. A file may remain on a busy official's desk for a week before he deals with it and passes it on to the next person. Any one person in this chain may become a bottleneck. Moreover, in this system of communication by the movement of files, there is little chance to present different viewpoints and even less chance to settle misunderstandings, in order to arrive at a solution based on mutual agreement. (230, p. 103)

These problems, and others which can be described, make it clear that the communication problem is much more complex than the mere absence of communication mechanisms. Considerable resources are sometimes devoted to the establishment of such mechanisms. But they cannot be expected to work well in the face of bureaucratic and administrative obstacles which result from deeply entrenched, traditional patterns of business behavior. (163, p. 2121) Where it seems impossible to revise administrative or bureaucratic systems in the short run--and it often is--the task is to find ways of circumventing them. Favorable results have been obtained by holding more frequent meetings or by increasing personal contacts in other ways.

There are various means of introducing personal verbal contacts. In Taiwan, for example, the Provincial Food Bureau set up annual production programs and targets which were then methodically introduced to lower echelons. The provincial programs and targets were broken down by prefecture and discussed at that level. From there, they were broken down by townships and discussed at township conferences. Such a system of ever-widening conferences was found to provide effective two-way communication. (46, p. 115)

In contrast with most other countries, mainland China has such a large amount of communications between different levels of authority that the volume of work effort involved sometimes threatens to be disruptive. However, frequent meetings of officials of three or four different levels do provide excellent opportunities for face-to-face communication among managers of institutions.1/ (219, p. 167) China has also introduced a more radical procedure to insure that higher officials understand and communicate with lower level officials. All higher level managers of agencies and other institutions are required, as a matter of course, to be transferred periodically to lower level positions for a year or two. An official in the center may be "sent down" to the commune level; a commune member may be sent down to the work brigade or to the lower production team level. The official generally retains his salary, seniority, fringe benefits and other perquisites of his original

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1/ One of Mao's most important and most ignored sayings is "Meetings should be brief."

organization. Yet even while he retains his connection to that body, he is expected to perform, during the "send down" period, as a member of his new organization. While one purpose of this procedure is to insure that lower levels get proper leadership and do not deviate from the correct line, an equally important reason is to insure that higher level officials have a clear understanding of the economic, social and political situation at lower levels. (219, p. 125)

2. Communications between Public and Private Sectors

If communications are frequently less than adequate within the public sector, one cannot expect them to be adequate between the public and private sectors. In many localities, the only real contact between a village and the government (and its development plans) may be limited to the tax collector. In others, communications may come down to the village by local government officials or the media, but with a lack of channels by which the wishes and needs of the villagers can be expressed to the government.

But there are other villages in which the inhabitants feel free to talk to officials or political leaders, confident that the conversations will be passed along to higher levels of government. This last situation, of course, provides the best soil for economic and social improvement. (580, p. 23) A good example of this kind of communication is found in Tanzania, where TANU, the government Party, plays an important part in insuring that downward communication is accompanied by discussions that generate comment by rural people and provide for changes in plans and programs. People seem to consider the plans and programs their own when they embody the results of their own efforts. (580, p. 12)

In Comilla, the system of communication that was developed involved low-level government agricultural officials at the source of information. These officials taught village representatives, who in turn taught fellow villagers. Each village representative was chosen by the members of the village cooperative and accorded the title, "model farmer." The model farmer spent one day at a training and development center where he learned about new agricultural technology and then reported his findings at weekly meetings of his village cooperative society. It was found that the model farmer was more effective than a modernized outsider in communicating problems associated with a new procedure; the farmer spoke in a language and manner which the villagers could understand. As a result, obstacles in communication were avoided which might otherwise have arisen through differences in vocabulary or culture. (275, pp. 685,686)

If communication is to stimulate rural people to adopt an innovation, it must surely explain the innovation in terms that

are acceptable to the culture where change is desired. This is not always done. In India, for example, a group of foreigners endeavored to get a village to adopt chicken raising without taking adequate account of the fact that farmers who were themselves vegetarians might have an aversion to growing chickens for others to eat. (580, p. 13) (For a further discussion of these issues, see the chapter on Extention and Research.)

XIII. EXTENSION AND RESEARCH

A. Technical Extension

Technical extension services in agricultural and rural development have generally been of two types: voluntary extension and compulsory or contract farming extension. (231, p. 64) In voluntary extension, the extension agent brings information and help with innovations to the farmers who are free to accept it or reject it. In contract farming, farmers who join a program (credit, settlement or cash crop program) enter a contractual relationship with the program. They are obligated to accept extension recommendations on penalty of expulsion from the project or prosecution; e.g., the Kenya Tea Development Authority (KTDA) has the power to prosecute failures to abide by program directives.

These two methods often blend into each other. The farmer may contract with a processor to produce a crop but follow non-compulsory extension advice closely. Supposedly voluntary programs sometimes take on compulsory attributes, as when overzealous officials try to force compliance as they did in China in the '50s and in Tanzania more recently. Extension agents often become involved in enforcement activities for credit agencies or land reform programs. Supposedly compulsory programs are, in fact, voluntary to the extent that supervision is inadequate. Thus, when credit programs are inadequately supervised farmers often do not fully comply with recommendations. The specific features and problems of supervised credit programs are discussed in the sections on credit in the Policy and Finance chapters. The same general conclusions are reached there.

1. Contract Farming

Contract farming has generally been limited to high value crops though some supervised credit and settlement programs are exceptions. For example, in Central America large scale farms integrated with crop processors dominated the production of the major export crops of coffee, sugar, cotton, beef, and bananas. Domestic food crops, e.g., corn, rice, wheat, sorghum and beans, were produced by small farmers. (231, p. 64; 358, pp. 11-12; 296, p. 200) Processors have a vested interest in pushing technical recommendations forcefully. A study in 1965 showed that in Chile the only crops grown entirely with improved seeds were those grown especially for brewers and oil and sugar processors. Sugar beet yields were among the highest in the world. In the Philippines, rubber grown for processors was one of the only crops produced consistently with new methods. (331, p. 151; 296, p. 504)

When processors organize producers of crops, e.g., as tobacco processors and brewers have organized tobacco and barley growers in Latin America, they usually do more than simply require producers to follow extension advice. They provide the inputs, a guaranteed market and, if necessary, the credit the farmer needs in order to follow the advice. This undoubtedly contributes a great deal to the high rates of use of new technologies achieved. (296, pp. 200, 384)

Although degree of supervision varies, the best results in contract farming are often associated with strict supervision. In Tanzania, of the two tobacco schemes at Urambo and Tumbi, control of planters was much stricter at Tumbi after 1965. Here only trained and experienced farmers were included and non-performing farmers were weeded out. At Tumbi tobacco yields and quality increased. As supervision relaxed at Urambo, both yields and quality (and hence prices) declined. (231, pp. 137, 222)

In Kenya, the KTDA was successful at spreading new practices to over 66,000 small-farm tea growers. The KTDA had an exceptionally profitable technology and an extensive and authoritarian extension and supervision system.1/ KTDA also had the advantage that farmers were extremely dependent on the Authority for learning the technology and processing of their tea. Eliminating subsidies, raising the price of planting material and levying a tax were all done with a minimum of dissension. This acquiescence was quite different from the resistance encountered by the Uganda Tea Growers Corporation which was established only after many small holders had already started growing tea and had arranged for their own processing. KTDA gives a week and a half of formal training and 18 one-and-a-half hour sessions in the field devoted to plant care, leaf picking and grading, etc. The local extension office also makes an average of five visits a year to grade the farmer, set deadlines for the correction of deficiencies and follow up to see that they are corrected. (63, pp. D37-D39; 231, p. 210)

The Gezira project in the Sudan is probably the best known and the largest project in the world based on contract farming. There, centralized management control led to expansion of the irrigated area, the building of irrigation facilities to include ditches to farmers' fields, to clearing and leveling of land, the use of water, seed production, the use of fertilizer, pest controls, credit, mechanized operations, extension, crop processing and marketing. (450, p. 2) Farmers were required to exchange traditional land

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1/ The KTDA also has successfully identified the actual constraints facing the farmer -- labor -- and has limited acreage per farmer to fit the farmer's situation. KTDA also makes use of a system of tea growers committees which give farmers a role in administering the program. (231, p. 73)

rights for tenancies of 16 hectares.1/ They had to include cotton in their crop rotation and cultivate the cotton satisfactorily if their tenancy was to be renewed. (451, p. 20)

Results similar to contract farming occur when landlords begin taking a more direct role in managing their lands. In Indonesia, decision making was taken over by landlords. Elsewhere farmers are ceasing to rent to tenants and are hiring farm labor instead. Tenancies are being paid in cash rather than in kind following the introduction of high yielding varieties. Combinations of these conditions are occurring in Bangladesh, Indonesia, Malaysia, the Philippines, India and elsewhere. The net result in all cases is that farmers are required by managers to use modern techniques. Unfortunately these techniques, e.g., mechanization, are not always in the best interest of the tenants or farm workers. (452, pp. 94-95)

In these cases the most successful contract farming was done with high value cash crops, often with export crops new to the farmers, as in Kenya and Central America. With new crops farmers have fewer preconceptions to overcome in adopting new practices.2/ Often, the cultivation of these crops is very exacting and the income high. Marketing boards and processors find they can afford to pay an extensive staff for in-field supervision of farmers. Cured tobacco in Nigeria is such a demanding and profitable crop that it has led to the development of highly competent extension services. (417, p. 188) Finally, the processor often supplies the inputs, credit and guaranteed markets that makes acceptance of the new technology easy and sensible.

The ultimate step in the contract farming approach is when not just extension and processing but an entire market channel from farmer to wholesalers in another country is especially developed for a high value crop. Such extensive systems have been developed for out-of-season perishibles shipped from Israel and North Africa to Europe and from Mexico and Central America to the United States. For a complete description of such channels -- a Commodity Systems Approach -- see 209.

2. Producers' Associations

Contract farming has been highly successful in getting farmers to adopt new technologies; it often gets close to 100 percent adoption by farmers. However, such contracts only reach a small fraction

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1/ In Ethiopia land grants were suggested as a way to gain control of farm management practices in order to promote development. (453, p. 301)

2/ In Kenya, illiterates often were more receptive to extension advice than literates and were most conscientious in following this advice. (63, p. D33)

of all farmers. Also, contract farming usually depends on the processor or some other buyer to approach the farmer and get things started. The alternatives are for the government or the farmers themselves to take this intiative.

Next to contract farming, producers' associations have had the most successful technical extension. In Latin America, producers of particular high value crops such as coffee, cotton or beef have been the primary beneficiaries of such associations. (296, p. 508) In Taiwan, individual crop associations were merged after World War II to form Farmers' Associations which have the same functions as producers' associations but for many crops. In China the hierarchy of production brigades, communes and counties carry out the same functions as in Taiwan and more. Outside of Taiwan, Japan and China, most producers' associations deal with only a single crop. (296, p. 367; 234, p. 20) The Cotia Cooperative in Brazil is a multi-crop association that markets over 100 commodities and has been very successful. However, it was founded by Japanese immigrants whose descendants make up half its current members. (454, pp. iii, 1, 29)

A number of things distinguish producers' associations from other technical extension. Producers' associations, whether in Latin America, Taiwan or China, provide more than extension. They are full-service organizations providing credit, marketing and inputs as well as advice on using these on the farm. (367, p. 41) The communes in China, the Farmers' Associations in Taiwan and producers' associations in many other areas also have their own research and seed-breeding facilities. (219, p. 84) Thus the farmer is provided the means to follow extension advice if he wishes.

Typically, as with contract farming, the quality of extension work is higher in producers' associations than in national extension services. In some cases this is because the associations are free of civil service or Ministry of Agriculture pay scales and can afford to hire top quality people. At the same time, since the farmers pay either all or part of the costs, there is a climate, as in China, of "perform or else" for extension workers. (219, pp. 157-158) Because all agricultural services are integrated or closely coordinated with extension, the agent is much less likely to fail due to circumstances beyond his control. Finally, the agent can specialize; he knows what he needs to know. Farmers, as in Chile, have more respect for specialist than generalist extension agents. (296, pp. 360-361, 367, 502-503; 75, p. 19)

Producers' associations differ from classical cooperatives in that they are frequently government established and have close government connections even when controlled by the membership. The Chinese commune is actually an institution of government as well as of producers. In Taiwan and Japan, the present associations were legally consolidated and restructured by government action. The government shares some costs. In Latin America, many producers' associations were founded by the government and regulate such things as area planted, plant protection, exports, etc. Membership by

growers is compulsory or, if not compulsory, non-member growers are still subject to the relevant regulations. (296, pp. 367ff, 508-510; 75, p. 19)

Finally, these associations are an indigenous response to the needs of a particular environment, not a model borrowed from outside and imposed from above. U.S. type extension, which concentrates on providing information and avoids involvement with credit, supplies or marketing of produce, works well in the U.S. where credit, supply and marketing institutions are well developed and available to nearly everyone and educational standards are high. In contrast, what is needed in developing countries is not just information but help in overcoming the lack of credit, inadequate and unreliable farm supplies and unstable or non-existent markets for higher value farm products. The producers' associations fill this need. The Cotia Cooperative in Brazil, for instance, expanded into providing farm supplies soon after its formation because of the low quality and high prices of commercial, often adulterated, supplies. (454, p. 18) Furthermore, producers' associations begin with the farmers and the crops that have the greatest potential for success. Only later have such associations been consolidated, as in Taiwan and Japan, to cover all farmers. Israel still has separate associations for various types of crops. (296, pp. 425, 502, 508) In any case, the effectiveness of these organizations depends on their being able to deliver an integrated package of services and information at the right place and time. (367, p. 41)

Although these are the best known associations which provide a package of services, there are other examples and variations adapted to other conditions. Malaysia is creating a Farmers' Association system from the ground up. Although the most important service offered is extension and this includes ideological coaching aimed at fostering self reliance, self improvement and unity, these associations have not neglected credit, supplies and marketing. For instance the Farmers' Association contracts to supply high-yielding planting materials and seeds to the Government. The Association then subcontracts, through local units of the Association, with individual farmers to produce the materials. (455, pp. 61, 66-67)

In India, which has an extensive record of failure of government promoted cooperatives and cooperative processors, one cooperative with many of the characteristics of a producers' association stands out.1/ The Anand Producers Cooperative is an association of some 185,000 milk producers in Gujarat and has become the model for developing similar cooperatives all over India. This Cooperative owns its own dairy plant, food mixing plant, artificial insemination and

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1/ For example, by 1973, the government had established 73 cooperative oil mills but 54 had closed down, the remaining 19 operated only with heavy subsidies; of 128 poultry cooperatives, 98 had closed down. (456, pp. 1755-1756)

veterinary services and operates a fleet of railway tank cars. It also provides a complete package of inputs and extension information. Even more significant, given the tendency of Latin American producers' associations to cater to the larger scale farmer, some 80 percent of the Cooperative farmers are said to be small operators averaging 1.4 milk buffaloes apiece.

What makes the Anand Producers Cooperative different from the less successful cooperatives in India, and in Kenya, where cooperatives have been imposed with little involvement by farmers, is the care taken to assure that members solidly support the cooperative society, both when the society is formed and as it operates. (283, p. 29) Member support is also a key to the success of the associations in Japan and Taiwan where members run the associations. In Malaysia, the members have the authority to run their Farmers' Association but in practice they are largely run by managers provided by the Ministry of Agriculture. (75, p. 19; 455, p. 61)

In Mexico, the Unidad de servicios ejidales (USE) program has been implemented by the Agriculture and Livestock Bank. The USE is a small company that provides technical services to local ejidos (a type of group farm) engaged in capital intensive agriculture, e.g., fruit, dairy, beef and hog enterprises. The farmers pay the cost of these services, about 5 percent of total production costs, because they find them useful and because extension workers are employees of the ejidos and can be removed for incompetence or if they are no longer necessary. Unlike most extension personnel, the USE staff live in the area where they work resulting in longer effective working hours and closer contact with farmers.

In Sri Lanka, services, such as research, extension, credit and supply of inputs were initially provided or coordinated by government agencies and delivered to farmers through government controlled cooperatives. Multi-purpose cooperatives took over responsibility for supplying these services.

In some cases, effective packages of supplies and services were provided, as in Argentina, by several independent institutions. Even then farmers formed cooperatives; for instance, cooperatives are very popular in Argentina. (331, p. 151) In Ecuador, the extension program in Guaranda was successful when extension, a strong wheat cooperative, the Cooperative Bank and the fertilizer companies worked together to develop a wheat program. They were benefitted, however, by a government supported price for wheat more than double the world price. (296, p. 303)

What is clear from all this is that sustained progress in adopting new technologies is associated with a combination of services delivered to the farmer. Usually this takes the form of a single institutional authority which supplies all services and inputs for a particular crop such as producers' associations in Latin America, Africa and Asia Sometimes it takes the form of a single association for all farmers and crops as in Japan, Taiwan, China, and Malaysia. (296, pp. 328-329, 502-503; 75, p. 19; 231, p. 219; 235, p. 179) In a few cases a number of institutions join to provide

the package. Even contract farming provides the same lesson: the most successful extension is a part of a package of all necessary services. (296, p. 385)

Most of these extension programs were expensive. Salaries were higher and equipment, e.g., transportation, was better than in the conventional technical extension services. Not surprisingly, therefore, these types of extension were all associated with high value, usually export, crops. Exceptions were barley production for brewers, the wheat program in Ecuador and the farmers' associations in Taiwan and Japan which also supported food grain production. The wheat program in Ecuador and rice production in Japan, however, were both assisted by extraordinary support prices, at least twice world price levels.

Part of the reason for the near universal connection of this type extension with high value export crops is that such crops often have to meet very demanding standards and hence need high quality supervision. At least as important, however, is the fact that exports, as well as brewing or subsidies, generate the income necessary to pay for high quality extension. Further, such crops often make the collection of levies to pay for the system easy. Export taxes are relatively easy to administer and collect, e.g., extension in Argentina is financed by a one and one half percent tax on agricultural export earnings. (231, p. 64; 296, p. 149) Producers' associations also have many ways to earn income from their operations. Some charge directly for extension services, but most make their income from price and marketing policies. The Farmer Association Integrated Hog Program in Taiwan, for instance, provides seven sources of income: credit, sale of purebred sows, stud fees, blending and sale of feed, inoculation fees, insurance and marketing. (231, p. 28; 46, p. 119)

High value crops not only finance quality extension, they provide higher and more reliable incomes for farmers. Higher incomes provide incentives and reduce risk for farmers leading to the higher than usual levels of adoption of new technology that the associations achieve. An association provides not only supplies and services but also some assurance that a market will be available, both this year and in the long run. The associations' control over marketing also provides leverage to encourage adoption of new crops or technology, e.g., the Farmer Association in Taiwan controls the sale of mushrooms and asparagus which are highly profitable due to high support prices. (340, pp. 83-84; 296, p. 326; 231, p. 219)

Unfortunately, the conditions that favor technical extension for high value crops do not apply to subsistence crops, and especially cereals, in most situations. Cereal output fluctuates widely and there are usually no highly profitable foreign or processor markets. If associations try to keep margins low to compete with private traders, they lose the resources to finance first rate extension. If they raise margins, they need price supports that few governments can afford or need to hold down prices to farmers in which case the crop leaks into private or black markets or is secretly exported

to higher priced markets. Because food crop production is less profitable, it is often felt that it does not need or justify heavy investments in extension. (231, p. 64; 234, p. 20) Thus, high-value-crop, producers' association extension has largely bypassed the small farmer, as in Ghana. (457, p. 19) Small farmers are excluded from joining in the production of high value crops -- this is not always deliberate -- and are excluded because the crops they do grow don't seem to justify the effort high value crops do. This does not mean that the producers' associations that have worked are wrong, but that ways must be found to extend their benefits to small farmers and to adopt them to the growing of lower value crops. (231, p. 28)

3. Technical Extension for Small Farmers

There have been cases of an extension service successfully operating outside the context of an overall service organization and helping small farmers. For instance, a new method of pest control was introduced by extension agents in El Salvador and was adopted by farmers. This control made the difference between a highly profitable crop and a loss and allowed the expansion of cotton production. (458, p. 9) In Cameroon an extension service introduced a treatment for cacao blight. Eighty-three percent of the planters knew the correct treatment and two-thirds began their treatments on time, often by saving some of the spray from the year before to guard against late delivery. Disease control in livestock is also a frequent extension success; in fact, successful control programs have sometimes left little time for extension services to work on improved husbandry practices. (331, p. 144)

In Mexico a high rate of growth in agriculture was achieved with relatively little extension as irrigation expanded and high yielding varieties were introduced. In Tanzania, cotton production expanded virtually without extension help when world prices increased, improved seed became available, tsetse fly clearance and water supply opened up new land for cultivation and marketing improved. Extension of better cultivation methods and modern inputs was much less successful. Nor was the development of block farms successful though cooperatives expanded rapidly. The cooperatives have a monopoly on cotton buying and own most of the ginning and milling facilities. (231, pp. 223-225)

Extension has been far less successful when the need for correct practices has not been as obvious, e.g., in promoting crop rotation, new cultivation practices and proper use of pesticides when a pest is not immediately threatening. In Malawi, for example, extension services seem to have been effective in promoting some improved practices for cotton, maize, and other crops. (331, p. 144) They achieved a high rate of acceptance of hybrid seed by offering to exchange hybrid for traditional seed. However, they had little impact on cultivation practices for maize.

Often the success of crop development is associated more closely with the availability of markets for output than extension coverage. That was the case of the cotton in Tanzania. It was also true of rubber production in Guatemala. Extension efforts to promote the growing of rubber were intensive, but the farmers have largely ignored them. Rubber production declined and even existing trees remain untapped as rubber prices declined and coffee prices rose. (296, p. 367) The role of marketing was also critical in many African projects. (231, p. 108)

In El Salvador and Honduras, extension programs were more successful than in other Latin American countries, but these extension services became involved in providing non-extension goods and services. (296, pp. 136-137) Elsewhere in Latin America, the isolation of extension from other services greatly reduced extension effectiveness. (280, p. X7) Much of the effect of extension in those countries where extension was coordinated in some way with other services was due to farmers imitating neighbors who were successfully using a new technology. Where extension operated on its own, however, there was no imitation by neighbors and even some of those farmers who had followed extension advice reverted to their old methods. There have been very few examples of extension of a free or low cost technology that could be extended without the use of new inputs. (296, p. 392) It is the package of services that keeps adopters in business. (296, p. 413; 416, p. 4)

The institutions which provide credit and supplies and do research in developing countries are often not, however, available or prepared to offer small farmers such a package of services. Credit agencies often have collateral requirements which exclude small farmers. Research organizations are often oriented towards theoretical studies or work on high value cash crops grown by large farmers or corporations. One way to solve this problem was found at Puebla in Mexico.

Here a group of technicians set out "to develop, field test, and refine a strategy for rapidly increasing yields of a basic food crop on small land holdings" and to train others to use the strategy. (271, p. VIII) At Puebla this meant concentrating on maize. It was expected that maize variety testing and breeding would be a large part of the program.

In practice, things turned out quite differently. No new varieties were introduced and the major effect of the testing program was to improve recommendations for the use of traditional varieties. (271, pp. 42-43) Nor were the technicians working primarily with farmers. Instead they spent much of their time in farmer organization, and the farmers did the demonstration work. Farmer committees conducted most demonstrations and about 15 farmers were hired as permanent field assistants. (271, pp. 16-17) A large block of total effort was spent on communicating with agricultural institutions. The project coordinator spent much of his time with these outside institutions. The Project staff frequently was required to prepare background material on various problems posed by

the operating procedures of these institutions. (271, p. 16) Participating institutions were invited to field days held to demonstrate recommended practices to farmers. This was to convince the institution leaders that the recommendations were reliable and to acquaint them with the abilities of the Project staff. (271, pp. 12-13)

This large block of time spent with institutions was necessary for several reasons. Many institutions' operating procedures prevented them from working with small farmers, e.g., the crop insurance agency would not insure corn interplanted with beans and the banks would not give credit without insurance. (271, pp. 51-52) Changes were needed so that procedures would reflect the recommendations of the project: increased fertilizer use required more credit per hectare; local conditions required a different mix of fertilizers from the 10-8-4 formula used until that time; and credit and fertilizer had to be available in March instead of May. (271, pp. 11-12) Finally, a number of local institutions were involved. Three banks were involved and the fertilizer distributer also provided credit. In 1969 one bank financed 2000 ha., two banks financed 1500 ha. apiece and the fertilizer distributer financed 5000 ha. (271, p. 13) What made this especially complicated was that the banks were extremely reluctant to change their procedures, and yet timing of fertilizer availability was important not only for best yields but for farmer confidence in the project. (271, pp. 12-14) In spite of the effort put in, progress was slow. (271, p. 63) Although some changes in procedures were achieved, much of the expansion in fertilizer supplies followed increased demands by farmers as consumers rather than actions by the technicians.1/ (459, p. 131)

What grew up at Puebla was a system in which the technicians took a major responsibility for communicating with institutions. At the same time, the job of communicating with the majority of farmers was turned over to various paid and unpaid farmer leaders. Thus technicians worked with those to whom they were closest in education and status. Similarly, intermediaries were placed between the technician and the farmer that were closer to the farmer in education and status; the farmer found it much easier to relate to these intermediaries.

The use of extension agents to communicate upwards has been helpful in other countries and situations. The Vicos project in Peru could not have existed without the upward intervention of the expatriate staff there. The Israelis and others have become aware

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1/ Lack of institutional responsiveness is not a problem everywhere. In Central America, fertilizer sellers were much more aggressive and this was a crucial step in reaching small farmers. (296, pp. 327-328) Even at Puebla, the fertilizer company had the most flexible and popular loan procedures.

of the need for extension agents to communicate upwards and are incorporating this theme in their foreign extension training. This involves training in skills for communicating upward, mixing of trainees from different institutions and training upper levels of institutions so everyone gets a common vocabulary and some notion of each others problems (see the Training chapter). (388, pp. 78-79, 115-116) However, in most countries there is still a need for even more contact between village and government or private institutions and a need for extension agents to do more to communicate the needs of the people to these institutions, to bring people and institutions together. (419, p. 3)

Unfortunately, some extension services deliberately separated themselves from other services. Some even pulled out of an area when other services entered or stopped working with farmers who accepted supervised credit or worked with other organizations. (296, p. 394) These extension services not only missed an opportunity to make themselves more effective; they rendered themselves ineffective. At Puebla, many farmers began joining project activities only when they saw that fertilizer was arriving on schedule. They had doubted that it would. (460, p. 78) In Ghana, the reliable delivery of fertilizer in small packages for first trials helped gain small farmers' confidence. As fertilizer demand grew, reliable supply continued to be a key part of the project. (63, p. C7) In convincing farmers of the usefulness of a new technology, it may be necessary to demonstrate not only the use of the technology in the field but also the reliability of the necessary institutional arrangements.

In summary, technical extension without a full range of supplies and services was successful when the need was clear and immediate, as in the case of serious diseases, or when the cost to the farmer was low enough, i.e., subsidies were high enough, as in a direct exchange of hybrid for traditional seed or distribution of free fertilizer. Beyond this, extension worked well only in an environment of adequate supplies of inputs, good markets for output and, where necessary, credit.1/ When these services were not available, successful extension involved itself in providing them, either directly, through farmers' organizations, by recruiting commercial suppliers, or by attempting to modify the procedures of other government organizations. Where inputs and necessary services are not available, the best thing the technical extension agent can do is help see that they become available.

a. Food - Cash Crop Conflict

The introduction of cash crops creates a difficulty for some small farmers, especially in Africa. Frequently export crop projects are affected by the amount of time spent by farmers in growing food

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1/ Skill training for artisans and craftsmen also needs an environment providing necessary services such as credit, and help with problems of design and marketing. (399, p. 244)

crops. This was a problem in cotton projects in Mali and Tanzania, tobacco projects in Tanzania and other projects in Cameroon, Malawi, Southern Rhodesia, Uganda, and Nigeria. Some export projects encouraged the growth of food crops and this worked where these crops were profitable. In others, the ZAPI in Cameroon, for instance, little or no attention was paid to food crops.

Where food crops were neglected, food production cut into the time and effort needed for cash crops. Large amounts of time were required for food crops since productivity was often very low in these crops. Labor demands in peak seasons clashed and led to the neglect of some cash crop cultivation, e.g., weeding. When food became scarce, farmers sold supplies provided for cash crops in order to buy food. This sharply reduced cash crop production. In Tanzania, food scarcities were followed the next year by a major increase in the acreage and work devoted to food crops. Markets are often fragmented in Africa so farmers cannot count on shortages in their area being made up by imports from other areas.

Attempts to promote food crops often failed because of government policies holding down food prices. Inadequate marketing facilities and roads meant that where food crops were promoted, higher output led to sharp declines in food prices as in the Ethiopian Minimum Package Program and elsewhere. The food shortage problem was most successfully solved in Africa where local markets for food crops were adequate or where the agency responsible for marketing the cash crop also took on the marketing of food crops. (231, pp. 27-33; 274, pp. 277-278; 229, p. 65; 63, p. F51)

In Latin America the problem of food crops was partially solved for some cash crops by developing crop combinations that provide security for the small farmer as well as cash income. Coffee and plantain, for instance, can both be planted on the same land. Farmers in Costa Rica had time, after harvesting tobacco, to plant another crop on land containing some residual fertilizer. (296, pp. 498-499)

Although this problem of crop conflicts is largely caused by fragmented markets and government policy, and hence is beyond the control of the extension service, extension personnel need to be aware of the problem as it may determine whether extension can be successful.

4. Clarity of Extension Objectives

One of the notable distinctions between the writing on producers' associations, contract farming and other successful high value crop extension on one hand and less successful technical extension on the other concerns quality of training and administration. The writing on extension is filled with discussions of poor training, poor morale, poor administration, confusion, lack of equipment and other administrative short comings. Long lists of things to be done if extension is to be effective are produced, e.g., see 412, pp. 43-45, 59. The discussions on producers' and farmers' associations,

however, read as if such problems did not exist. Only rarely do you find mention of a problem such as corruption in assigning production quotas in Taiwan. (340, pp. 83-84)

Partly this may be due to the higher pay that high value crop associations pay. This allows them to be more selective and to overcome some of the problems that most seriously damage morale, e.g., low pay and poor transportation. More than this, when the extension agent knows who his clients are and is assured that the necessary inputs and services are available, other problems seem to melt away. Problems just do not seem to arise to the same degree as in conventional extension programs.

Most contract farming and producers' associations are single crop operations. Often the end products desired are specified in great and exacting detail, e.g., through quality standards for types of tea. The fact that the farmer has joined the assoication indicates a relatively high commitment to achieving a certain product quality and a willingness to concentrate much of his effort on that crop.

Things are not quite so simple in the Farmers' Associations in Taiwan and Japan but are still clear. Here many crops are handled but farmers are well tuned into the system having had more than a generation of experience with producers and farmers' associations and with commercial production. The extension agent need take little time trying to convince farmers; they are already prepared to listen. Instead he can concentrate on providing information.

Having clear objectives, knowing what his job is, makes things much easier on the extension agent and on the whole administrative-service-technical system of which he is a part. Problems and failures just don't occur as often as when objectives are unclear, too broad or too numerous and contradictory. These latter conditions, however, are typical of many extension services.

Thus the Village-Aid and Village Level Workers that were tried in India and Pakistan in the 1950s were to "act as educator-organiser-planner-friend-philosopher-guide to the villagers." They were to help the people define their needs and problems, organize themselves for planning and action to meet needs and solve problems, and execute their plans using primarily village resources and a minimum of government services and resources. (461, p. 327) The result was the opposite of the conditions that made for successful producers' association extension. Instead of a simple clear job to do, careful definition of clients and a full range of complementary services, the village worker was given no clear definition of what he was to do. He had to respond to anyone and everyone and he was given few if any supporting services. No wonder the village worker programs were given up as failures.

When goals are vague or unachievable there is a tendency for people to substitute some more achieveable goal for the actual goals. For instance, although the village workers had little or no impact

on agricultural output, it was later suggested that they may have prepared the way for acceptance of later innovations. Similarly community development is often justified as improving peoples' attitudes when no other results have been achieved. When progress is not easily measureable, people often become more interested in the method of what they are doing than the outcome. Thus they concentrate on more hours of training, higher qualifications, larger budgets, better equipment as if these were signs that progress was being made. (388, pp. 210-211) This is the behavior that produces the long lists of things to be done mentioned above. It also produces the emphasis on extension methodology at the expense of content that ruled most Latin American extension during the late 1950s and early 1960s. (296, pp. 128, 77)

Thus the systems that work are those that promote the evolution of clear objectives so that extension or other service workers know fairly precisely what they must do. One way to achieve such clarity is to concentrate on only a single crop or a single technology such as a pest control. There are, however, other ways.

B. Problem Solving Extension

The difficulty with the above forms of technical extension is that they have strongly favored better off farmers and neglected marginal or subsistence farmers. (296, pp. 50-51; 462, p. 58; 207, p. 18; 163, p. 2127) Even extension and services for grain production have favored larger farmers as in India and Pakistan. Extension support for subsistence farmers has been almost nil. (234, p. 30; 85, p. 14)

This is not necessarily wrong. It is easier and more economical for extension services to deal with a few large farmers than many small ones. (206, p. 29) Larger scale farmers tend to be more responsive and, if they adopt a new practice, are able to implement it on a larger scale. Credit and inputs are more available to large farmers, the risk of new practices is less. If the national goal is immediate increases in output, then concentration on large farmers may be the preferred approach. If, however, other objectives are also being sought, then these must be communicated to the agents to guide them in the desired directions. (206, p. 29; 399, pp. 127-128) In addition, different methods must be used.

Although they are not as common as successful examples of technical extension, different methods have been tried with small farmers, including subsistence farmers, and these methods have worked. These methods have taken quite a variety of forms, however, so it is not as easy to identify the elements of success in these cases.

1. Problem Identification

Program Building is the name given to a process of organizing farmers to undertake projects that was developed in the early 1960s and applied over a wide area in what is now Bangladesh. The first

steps in Program Building were to get the agreement of the local community to the program, to conduct a survey and to hold a discussion leading to the formation of committees to attack priority problems. Agreement of community leaders and leading farmers was obtained at a meeting during which the program was explained. The fact that responsibility would rest on them, not the government, was emphasized. If the program was accepted by these leaders (in this case they represented a Union, about 10,000 people) then they were provided forms for conducting a survey of their community.

This survey touched on all aspects of village life including farming, health, education and recreation. The data was compiled with the aid of the extension worker and presented at a second meeting. This meeting included the participants of the original meeting plus other local leaders and more leading farmers. This group went over the survey results, discussed them -- often extensively -- and set priorities on the problems identified. Subcommittees were then formed to deal with these problems. These subcommittees consisted of one member of the Union Council plus at least two interested farmers. (76, pp. 259-260; 429)

Where any of the meetings did not accept the program, they were thanked and the extension workers went on to other communities. The meetings and survey, however, led to considerable discussion throughout the communities. Many communities that initially refused later changed their minds and joined the program. Others decided to join after they saw the results in other areas. Ultimately coverage became complete enough so that block farming over hundreds of acres could be organized.

Program Building was remarkably successful and teams from a number of other countries studied it for consideration in their countries. It contributed to significant increases in rice yields, led to farmers organizing their own marketing aid and credit, led over 100,000 farmers to attend night school and organized and carried out many projects under a Rural Public Works Programme. The program continued to grow and became official policy for all of East Pakistan until the coup which overthrew General Ayub. (429, pp. 7-10) (Further comments on Program Building and its originator are in the section below on Objectives of Problem-Solving Extension.)

The Akoliufu Pilot Project in Eastern Nigeria began with a somewhat similar process. The purpose of this project was to provide employment in rural areas by establishing plantation crops. At the time the project activities began, an agricultural extension agent had been living in the village for nine months. He was virtually unknown in spite of a large sign proclaiming his presence. Of 200 villagers who attended the first project meeting, only five knew what the agent was doing in the village and only three had taken advantage of his services.

Before meeting with the village, project staff met with the chief, village councillors and executive members of the village union to explain the project's purposes in detail. Names of other

influential people who could either assist or obstruct the program were obtained. A truck was then borrowed to take the officials and influential people to an agricultural station and a farm settlement where government officials explained the government agricultural program and the benefits of modern farming.

After this, a meeting was held in the village and further meetings were held monthly thereafter. The initial meeting was attended by about 200 of over 4000 people. Subsequent meetings were attended by those directly involved in the project and other interested people. These meetings were an education for the village and permitted a dialogue between the people and various government officials. Open and frank discussion covered the methods and organization that would be necessary for launching the project, and also solved, or gave warning of, the problems that arose during implementation.

This project got the villagers to cooperatively clear land and plant tree crops and other alternative crops for income until the trees matured. It also provided other economic activities such as a nursery, poultry and goat keeping and certain processing activities. The land was voluntarily leased by a large number of owners, consolidated, voluntarily cleared and then project participants, nominated by the village kin groups, farmed the land. Although the legal arrangements were quite complex and formal, the project maintained the community's support and succeeded with the project. In the first year the government bought 13,000 palm oil seedlings at a large enough saving compared to production on Ministry of Agriculture farms to pay the subsidy used to establish the project. The sponsors of this project attribute most of the success to the careful preparation of the village, the frequent meetings and the involvement of the people (e.g., nomination of participants by kinship groups). (463)

Staff of the Leribe Pilot Agricultural Scheme in Lesotho held a group meeting with all the village chiefs in their project area followed by meetings with each chief individually. These were necessary to overcome opposition created because the chiefs were not fully consulted at the beginning of project work. The agent explained the project and sought the chiefs' views on what the project should do and what it should not do. Basically the chiefs wanted the project to work within the ongoing framework of land tenure and administration (there had been rumors the project would abolish individual holdings). These meetings were then followed, once the chiefs were willing to support the effort, by meetings with the farmers to explain the project and answer their questions.

An initial survey of past projects and schemes in the Leribe area began before the meetings with the local chiefs. A formal survey of land ownership and use, household data, income, and farming practices began concurrently with the meetings with the chiefs and continued afterwards. All of this survey work was done by the Project staff which was made up of Food and Agriculture Organization of the United Nations personnel with Basotho counterparts.

Each of the village chiefs was asked to form a Village Pilot Scheme Committee made up of the Chief, one representative each from the Village Development Council and the Village Land Use Committee and three farmers elected by the village farmers. These committees were the basis for carrying out a number of conservation projects and were to assist in promoting the use of technical packages.

The conservation works were designed in cooperation with the chiefs, their advisors and the Village Pilot Scheme Committee. Procedures were kept very simple, e.g., the project workers elected their own foreman and secretary and were paid in food. The technical packages, however, were designed by the project staff, primarily the foreign staff. The farmers were not consulted and the comments and objections of the Basotho staff were largely ignored. Once a farmer agreed to demonstrate a package, the main operations were carried out by contractors under the supervision of the project staff. The farmers were obligated to pay for these contract services and do the hand labor such as weeding.

The result was that there was considerable enthusiasm for working on the conservation projects. Thirteen fish ponds were dug, 40,000 trees were planted and other earthworks completed. Erosian was reduced and communications improved. The technical efforts resulted in the expansion of cash crop production and the use of some new practices. However, there was considerable resistance to the packages proposed and farmers did not adopt whole packages. Farmers did not regard the application of the packages on their land as their own and failed to carry out their portion of the work. They became discouraged and dropped out of the program. In spite of the success with the conservation projects, the Village Pilot Scheme committees became moribund largely due to opposition to the technical packages. Finally the project was far too expensive to become a model for the country or even to be significantly extended. (63, pp. E12-E24)

As pointed out in the discussion on technical extension, the concept of extension in the Puebla project changed during the term of the project. The project began in 1967 with a quick survey of the area by the project coordinator followed by a formal survey and farmer interviews. At the same time contact was made with the heads of local institutions such as banks and fertilizer distributers but not with local leaders in the communities.

The survey teams encountered negative reactions, even hostility, from farmers. This led the project leaders to change their approach to extension work and to make their initial contact with community presidents. They explained the program and then got the presidents to set up meetings for the project personnel to explain the program to all local authorities in their communities. Such meetings were held in virtually all communities.

During these meetings, the project was again carefully explained. The limits of what the project could provide were set out and so were the ways the farmers could cooperate. The meeting participants

were asked who in their area might be interested in cooperating with the project. These local authorities usually asked for time to return to their villages, explain the program and get volunteers. In a few cases the local authority himself volunteered. (271, pp. 45-46)

From this base, work with individual local farmers began. As the program expanded, work was begun with groups of farmers. But at this stage these groups were primarily involved in obtaining fertilizer and credit. The extension agents were careful to give the farmers complete responsibility for these organizations but the farmers took no interest in them other than as a source of inputs. A second formal survey via interviews of farmers was conducted and the maize breeding component of the project was dropped. A big problem of the project was then how to develop the farmer organizations' capacities to solve their own problems.

Late in 1973 after months of discussion about how to work more effectively with farmer groups, the extension agents held a series of meetings with farmers to explore ways of increasing farm income. These meetings were encouraged to identify one problem as top priority and were usually able to do this.

The extension agents then organized those farmers who were interested in the priority problem into a new organization to deal with the problem. For instance, one of these organizations was the Union of Progressive Maize and Bean Farmers which had 95 members from nine villages and a Governing Board of 18 farmers. This organization concentrated initially on finding cheaper sources of chicken manure for their fields. (271, p. 53)

The extension agents for rural development projects run by the Shell Oil Company in Portugal, Venezuela, Nigeria, Italy and Thailand began their work by seeking the permission of local leaders to conduct a survey. This permission was obtained through a series of meetings with the various leaders of a community of from ten to fifteen thousand people. The survey took from eight months to a year and was conducted by the agent with the help of local leaders and field assistants. The help of the local leaders was important to establish an atmosphere of participation and cooperation. When the survey report was completed, it was published and distributed.

This report identified the basic problems of the community. On the basis of this report, project objectives were formed and action begun. In addition to problems, the survey also uncovered community resources and patterns of cooperation that could contribute to solutions to the problems. The agent separated the problems into simple and complex ones and began by introducing solutions to simple problems to a few farmers. Gradually simple solutions spread to more farms and farmers tackled more complex problems.

Innovations were introduced by discussing a problem with the people concerned with the problem in the community. The agent noted the degree of interest and motivation connected to various problems

and then sought solutions, often from outside specialists, for the problems that were of greatest interest. Once the most suitable, potential solution was found, the agent explained it to the people, urged them to adopt it and used the results obtained to convince others to introduce the same innovation. (464, pp. 16-21; 63, pp. F42-F56)

This approach has been highly successful at raising income and introducing new methods in the areas where it was tried. These areas were limited, however, as the method is costly and time consuming.

In Niger, a marketing cooperative was organized by first holding a joint meeting of local officials and extension agents with farmer representatives. This meeting analyzed the weak financial position of the village and went on to discuss the possibility of the farmers managing their own groundnut trading. The meeting debated at length the various skills that would be needed and the form of organization they should adopt if they were to succeed in replacing the private trader. No attempt was made by the outsiders to force the adoption of a particular form of organization. The system evolved out of the discussions, other village meetings and later experience. (465, pp. 30-34)

The need for a problem identification phase is not unique to getting farmers to work on their problems. For instance, the head of Health Services in Maradi Province in Niger wanted his health workers to change from a passive to an active conception of health care. Instead of simply staying in their dispensaries waiting for patients, they were to take some responsibility for the health of all the villages served by their dispensary. It was not expected that this change would be easy to bring about as all the health workers' training and experience emphasized curative medicine and passive care.

The head of Health Services began with a series of short training sessions. Here the nurses were asked to keep a record and map showing the actual influence of the dispensary. These records were to be based on the information routinely taken at the dispensaries for each patient. These records and maps provided not only data on usage but also a visual picture of usage.

The conclusions that emerged from this exercise were that: (a) only fifteen percent of the population was being served by the dispensaries and beyond a seven mile radius, no one was served; (b) more than 50% of the diseases treated at the dispensaries could have been avoided or treated easily by a simply trained village health worker; (c) one-third of the patients were children under three years old and many of the women patients were pregnant.

These conclusions led to passionate discussions among the nurses and the physician in charge of the Province. More and more nurses became convinced that health services should reach the whole population, not just those who came to the dispensary. As a result,

meetings were held in the villages to discuss health. A process similar to that discussed above for marketing in Niger led to the creation of a system of "barefoot doctors." Much of the information needed to design this program was obtained during these village discussions. (423, pp. 5-7)

Certain common themes emerge from the successes in these examples. There were three distinct stages in making contact with and coming to understand community problems before solutions to these problems could be found. First, community leaders were approached and their support and cooperation was obtained. Second, a survey or other method of agreeing on certain basic information was used. Third, there was a discussion and priority setting stage where the community as well as the leaders come to understand and agree to the specific things being done. Only then was it possible to go on to successful problem solution.

These stages took different forms in the different cases. In Program Building the survey was done by the community leaders and farmers, in the Shell and Leribe projects by the staff. In most cases, the three stages stretched over weeks, as in Program building, or up to a year and more as in the Shell projects. However, in Niger the three stages were condensed into a single meeting. This was possible because the meeting concentrated on a single issue known from previous contact with the farmers to be a problem in the area. In some cases, outside decision makers used the information gathered in formal surveys. In others, such as in Program Building and the Niger health delivery case, the decision makers, in this case people in the situation, used the information from informal systems of information gathering to become aware of certain problems and to give the problems an explicit, concrete form.

The procedures used in introducing these extension efforts were quite different, and they must not be allowed to overshadow substance. Although the organizations used in Program Building in Bangladesh and in the Leribe Scheme in Lesotho were similar, the results were quite different. The organizations in both cases were development committees made up of local leaders and farmers. At Leribe, conservation projects which used simple procedures and were planned with the farmers were successful. The foreign project organizers, however, selected the technical packages and farmers were not consulted. The farmers resisted these packages, adopted only parts of the packages and dropped out of the program. This is a sharp contrast to areas where Program Building was initiated. Here the foreign advisor thought of himself as a "sharp stick" to get the extension agents to go out to the farmers, organize them, find out their needs and get them to seek out solutions. As a result there was a high degree of voluntary effort, many improved practices were adopted and the program expanded rapidly.

At the same time, some projects where the professional staff made many of the decisions, e.g., the Shell projects, were successful in their extension efforts. Although these projects made the project staff the surveyors and primary decision makers, as did the

Leribe project, they also took seriously the need for the farmers to set priorities and for innovations to be gradual and adjusted to the farmers. Thus they took the job of obtaining input from the farmers seriously and went to considerable pains in doing it. In the Shell projects, for instance, they tried to survey a very large sample, thirty to forty percent of all farm families. This was not just to get information but to establish contacts to follow up on later. (464, p. 17)

At Puebla the staff started with a staff-centered approach but shifted gradually towards more farmer involvement in problem solving. But they did not reach the stage achieved in some of the other projects. Concentration on a single problem and requiring formal organization both limited participation. A major limitation of farmer organizations at Puebla, and a reason why small farmers have often been left out, is these organizations' inability to solve complex problems affecting the entire community. (459, p. 274)

2. Making Contact

Each of these three stages has been found to be important, often the key to success or failure, in many other situations. Making contact through local leaders has often been a key to success. A nonformal education program in Ecuador found it necessary to obtain the cooperation of the local political officer and priest before beginning work in the community. This was especially helpful because the agents were able to get them to enter the activities as participants rather than as dignitaries. (391, pp. 91-92) In Nigeria, extension agents on a tea project began by working through local Yoruba leaders but gradually began working directly with farmers. This did not seem to create problems between the company and the leaders, perhaps because of the business orientation of the Yoruba. (63, p. F14) In Ghana, it was necessary to work through traditional leaders among the Dagomka, a Muslim tribal group, but extension worked best if young married men were the initial experimenters among the Komkomba, a mobile, less traditional group. (63, p. C3)

Making initial contact through local leaders does not mean that all further efforts must be controlled by them or that they should be allowed to veto changes which benefit others. On the contrary, successful projects have not allowed such a veto power to develop. The Program Building approach goes the opposite direction by creating a large number of subcommittees which provide many more people with leadership experience even while including traditional or elected leaders. Although this approach may seem to involve a lot of organization and even bureaucracy, this is a good thing at the village level. Local organization provides widespread training and opportunity for leadership. It also provides opportunities and reason to practice literacy and other skills and provides familiarity with government and other procedures for a wide circle of people. (46, p. 414)

Local project leadership does have to be watched. In India, Pakistan, Bangladesh and Senegal, the local power structure got control of local development programs and diverted programs and resources to their own uses. (466, pp. IB, 9; 238, p. 322) Merchants and moneylenders opposed programs which would help small farmers achieve financial independence in Mali, Latin America, India, Pakistan and Bangladesh. New programs eroded the authority of traditional leaders leading to their opposition, as land registration sometimes did in Malawi. (231, pp. 95-96) In Nigeria, a tomato growing project ran into difficulty because village heads often favored their relatives in selecting project participants and in allocating irrigation water. Sometimes they cheated farmers by takin part of the profits. Farmers frequently appealed to the district head to have these problems corrected. (63, p. F27) In New Guinea, the people in the community were unwilling to subscribe to a fund to purchase more plantation land -- land they wanted. They feared that because the Australian administrators insisted on dividing the land up into a few large plots, only a few "big men" would benefit from the purchase. (467, p. 266)

Traditional, local leadership cannot be relied upon to support development efforts in all cases. However, it has proven worth the effort in practice to assume that they can be induced to help and to spend considerable effort to bring this about. Where local leaders have helped, projects have received a big boost; in fact, this often makes the difference between success and failure. Where the local leaders are unanimously against change, little has been lost in making the effort. Unanimous opposition will be rare, however. Even where, as in Malawi, change was undermining traditional power, not all traditional leaders were opposed and projects were successful. (231, pp. 95-96) Apparently some leaders either didn't realize what was happening or were prepared to accept change and develop a more dynamic basis for their position. In all cases, local leaders should be given this chance since experience shows that is what makes the extension job easier and in many cases possible. At the same time, because local leaders are not entirely trusted, it is necessary to follow up meetings with the leaders with meetings with the farmers or at least with a large group of popularly recognized leading farmers. This was done in Program Building, in the project in Lesotho discussed above, by the Shell agents and elsewhere. Where it was not done, difficulties were encountered as in the tomato project in Nigeria.

3. Information Gathering

The survey or information gathering stage was also important in determining the success of failure of many projects. Information gathering has taken many different forms. Formal surveys by professional researchers were important in the Special Rural Development Program in Kenya. They were crucial in establishing that major technological breakthroughs were unlikely; a strategy of gradual development on a broad front had to be adopted. (231, p. 146) The Daudzai Project in Pakistan took 8-10 months to study the Daudzai area and identify the area problems, and more important, the different problems which

affected different villages. This survey also identified which of these problems the people felt were most important and should be concentrated on. (37, pp. 6-7)

The French had a different form of village information gathering stage that concentrated on the accurate observation and evaluation of economic and social conditions in one's own community. In Senegal this sense was imparted to potential village leaders in training by having them visit and observe a village other than their own. (46, p. 413)

Paulo Freire in Brazil developed another method of developing observation of one's surroundings. He studied local communities, abstracted key themes that were typical of and important in the community and then recreated these themes in the form of large pictures. These pictures could then be used as information for group discussions. In the discussions, farmers saw themselves in pictures in ways they could not see themselves when they were a part of the situation portrayed. This led to increasing self awareness and self confidence. (404, pp. 75-118; 405, pp. 61-84) This method was also used to identify key words that were used as the basis of a literacy program. (See Training chapter.) (405, pp. 49-59)

4. Problem Discussion and Priority Setting

The third step in the process is problem discussing and priority setting. Sometimes this blends into problem solution as in the formation of the marketing cooperative in Niger. In most cases, however, this is preliminary to the search for solutions. This is the most important of the three steps and is the stage that comes closest to what is often referred to as participation.

One study found that eight of ten projects in which there was considerable local involvement began with discussions leading to the identification of local problems for the project activities. Only two began with a particular technical package; both of these packages were unproven and required farmer participation for tests. (417, pp. 102-103) In West Africa, two Frenchmen found that by sponsoring group discussions where farmers articulated their problems and needs, the introduction of technical change was made easier. The discussions had to be directed towards the implications of technical change and its effect on each member of the group. (231, p. 79)

Many projects have found that the village people have a strong notion of what their priorities are. In Jamaica, for instance, coffee growers were little interested in conservation of coffee lands or improved varieties of coffee unless their number one problem -- inadequate coffee prices -- was solved first. (295, p. 102) In the Daudzai project in Pakistan it was found that people could be organized around the problems that they felt were the first priority. The people had to be the ones to select these problems, however. They refused to cooperate if their priorities were not followed. (37, pp. 9-10)

In Taiwan, extension services found they had to learn from the farmers what the farmers wanted or needed instead of trying to tell them or teach them what their needs should be. (367, p. 22) Actual projects were largely developed at the village, township or provincial level, often by farmer or other local committees responsible for implementation. (367, p. 37)

The Bimas program in Indonesia found that reliance on a centralized bureaucracy led to failure and farmer resistance and antagonism. The government began to widen the scope for farmer initiative although they were still far from the level of initiative suggested above. (468, pp. 80-81) The first Ethiopian manager of the CADU project in Ethiopia realized that one of the lessons of CADU was the need for more farmer involvement in project activities from the beginning. (231, p. 110) The need for farmer participation is also being recognized in Latin America though so far little has been done about it. (306, p. II-28)

Perhaps the most striking examples of the importance of the problem discussion and priority setting stage are provided by two cases in Ecuador. In one case a group of AID and Peace Corps personnel and Ecuadorian students had a small training center. They would visit a village and when asked about their purpose would explain that they were there to listen. The villagers did not believe this, feeling sure the outsiders were going to try to teach something. After two days of not being taught, the villagers got themselves together to talk to such strange people. The villagers began by simply telling the outsiders what they knew of the area. Gradually this discussion led the villagers to become aware that there were things they could do themselves. Out of this evolved a project that was run largely by Ecuadorians who were very possessive about their project. One Ecuadorian commented that the AID representative visited the project too often; it was their project, not AID's. (469, pp. 53-54)

A non-formal education project in Ecuador developed a wide range of literacy and awareness games and materials. Evaluators of this project found a direct relation between the number and success of community development projects and the degree of participation and dialogue in the training sessions. The more talk, the more action. (391, pp. 96-97, 187-188) What these two Ecuadorian examples show is that the discussion-dialogue-analysis stage is often sufficient, even without a survey stage, to create community problem solving and action.

a. Lack of Farmer Involvement

Just as making their own decisions improves the chances for community project success, lack of local involvement in problem formation and selection often leads to the defeat of projects. Unfortunately, lack of involvement is still very common. In Kenya, for instance, in one Special Rural Development Program area, people were not even informed of projects being implemented in their area. Sometimes they were informed through formal meetings but few questions

were permitted and no modification of plans was considered. Not surprisingly, the people often opposed projects that were supposed to be for their own good. (231, p. 163) Farmers in the Vihiga SRDP area failed to make contributions of labor and funds for cattle dips. Several of these dips had been initiated as the result of urging by local government officials. The farmers neither fully comprehended nor fully agreed to the effort. Little or no consultation with farmers had taken place. (63, pp. D5-D6)

When the farmers are not involved in the selection of problems and the seeking of solutions, a number of problems occur. For instance, farmers in the ZAPI project in Cameroon saw the project operations as decided upon far from them, perhaps even in France, and as controlled by foreigners. They expected it to last only a short time since other foreign projects had been short lived. Farmers perceived a similar sense of distance and unreality about the workings of the WADU and CADU projects in Ethiopia, of SODENKAM in Cameroon and of the ujamaa movement in Tanzania. (231, pp. 110-111)

Cooperatives established or revived by the Barpali Village Service in India consistently failed because the farmers did not understand them nor take responsibility for them. They were the Village Service's projects and even the activities the cooperatives were designed to promote were not felt needs of the farmers. (470, pp. 19-20; 471, p. 36)

The Government of India constructed a small irrigation dam for a village. The government did not ask if this was what the people wanted. In fact, the people felt erosion and flood control were more pressing problems. The result was continual opposition to the project during its construction. Only eight farmers used the irrigation water and some of these were pressured to do this by government officials. Although use of irrigation water grew gradually, it did not become widespread in the village until management of the irrigation system was turned over to the village council. (58)

The Government of India also provided a village with funds to construct irrigation wells that would permit the doubling of crop yields. Instead, the people put the wells in the center of the village so they would no longer have to carry water two miles from a river. The author who cites this example suggests that before providing the funds, the extension agent should "have tried to develop a felt need for irrigation." (472, p. 172) Experience shows, however, that this would be unlikely to be successful.

Generally it has not proven helpful to try to pressure a community that is not yet ready. Program Building extension agents, for instance, simply offered help and then, if the farmers were reluctant, withdrew and waited. There were always other communities that were not so reluctant that deserved immediate attention. Often it took considerable discussion before a community could agree to

test the changes that the Project implied. Eventually they called the Program Builders back. Assessment of community interest was an important factor in selecting farm groups to work with at Puebla and selecting problems to concentrate on in the Shell projects. (271, p. 12; 464, p. 21)

b. Explain Enforced Changes

It is sometimes necessary to make a change that many people affected will not have agreed to. This may be due to lack of time to reach the people or to the inability to get universal agreement on a project, e.g., land reform or resettlement due to the construction of a dam, irrigation system or roads. In this case, it is imperative, as a land development and reorganization scheme in Malawi found, to explain fully and in advance what will happen and why. In Malawi the extension agents had to explain the basic land reorganization and then spend a good deal of time later explaining land registration and its benefits.

When such advance explanations are not given, the result is often to make a bad situation worse. The Special Rural Development Program (SRDP) in Kenya started building a road into an area as a first step in a rural development effort. No meetings with the people in the area to find out their needs, offer help or explain the program were to be held until after the road was completed. The people interpreted the road as a device to let the police more easily come to interrupt their cattle-raiding activities. When equipment arrived to begin building the road, the people objected vigorously, police were sent to guard the equipment and the antipathy of the people to the road and perhaps to the SRDP was consolidated. (231, p. 163)

In a desert area of Peru, people had been demanding for years that the government provide wells. Finally the government agreed to provide six wells but no attempt was made to explain what was to happen or how. The drilling team arrived in the village, set up and started to drill the first well on the most likely site available -- the land of one of the wealthier farmers. The people leapt to the conclusion that all the wells would go to the wealthy farmers; they preferred that no wells be dug than that they be dug only for the wealthy. The now hostile villagers forced the drillers to stop and withdraw from the village. The project was abandoned. (331, p. 66)

c. Awareness of Problems

One reason group meetings are so effective is that they make people aware of the extent that they have problems in common. They can have confidence, because they have recognized the common nature

of the problem, that the solution that works for others will work also for them.1/ This is a quite different result from that obtained when extension agents try to approach individual farmers with a new technology. In this case, the spread of the new technology to additional farmers is often nil.

Group meetings are also important because they provide social sanction for experimentation. This sanction not only makes individuals more ready to experiment, it makes other members of the group more prepared to follow. Thus the group meetings used for introducing innovations in French West Africa were encouraged to select volunteers to try out innovations. But instead of being isolated instances; such volunteers were acting on behalf of the group. The task of innovation was delegated to them by the group. (231, p. 79) The village, not the individual, is the major decision making unit for many types of decisions in Asia, Africa, the Middle East and Latin America. Individuals will not act, or do so only at great social risk, without the support of their community. (10, p. 21; 473, p. 55; 50, p. 8; 474, pp. 1,3)

Awareness of common problems can also be the basis of organizing farmers since problems often are susceptible to joint solutions. People learn to work together. This is discussed further below.

Finally, strange as it may seem, awareness of common problems and experiences seems to raise confidence. A radio school program in Honduras, for instance, credited a great deal of its success to the feeling created in participants that they were "part of an awakening group." Awareness of the similar experiences of other people in other centers in Honduras was fostered in training sessions and meetings, and was closely linked with a growth of confidence and concern. (391, pp. 136-137)

5. Follow Up

Once activities in a community have begun, it is not enough to simply rely on the initial actions by the people to be self sustaining. The original commitment must be renewed, new priorities

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1/ This builds on a finding at CADU in Ethiopia and elsewhere: progressive farmers are more strongly impressed by extension agents and demonstrations than less progressive farmers. The latter tend to rely on familiar sources, e.g., friends and relatives more than on model farmers. Visual evidence was more impressive to progressive farmers, oral influences were most successful with the less progressive. (231, p. 80) Hence it is not surprising that discussion leading to a consensus decision to encourage a few progressive farmers to try an innovation would help prepare less progressive farmers for adoption of the innovation.

set and new activities undertaken. This is most easily done in the framework of an organization such as the committee structure of Program Building. However, it can also be done in informal meetings such as the initial discussion and priority-setting meeting.

Belloncle and Gentil in their work in West Africa recommend this latter pattern. After problems were identified in the first meeting and potential solutions formulated and then tried by some community members, there was a follow-up review meeting. At the review meeting, successes and failures were reported and evaluated and the specific constraints on using the solutions were identified. These constraints and failures then became the agenda for further priority setting and a renewal of the cycle leading to finding new solutions and testing them. Again, the extension agent must be an advisor from whom the farmers seek information, not a pusher of preconceived packages. In practice, these self appraisal meetings were very successful in expediting change. (231, pp. 79-80)

6. The Extension Agent in Problem Solving Extension

Latin American land reform organizations often organized asentamientos, a combination of temporary collectives and small farms allotted to individual farmers. This form was not adopted because the farmers wanted it -- the farmers were usually against it -- but because the officials felt that the farmers were too inexperienced to manage their own farms and needed to be trained to do this. (355, pp. 3-4) In practice, output was higher, often much higher, on the small farms than on the professionally managed collective part of the estate.

Collective farms, although supposedly democratic, are in practice usually bureaucratically run in Latin America, Tunisia, Tanzania and elsewhere. (355, pp. 14-15) Confidence in the people who are to gain from land reforms is very low. (355, p. 23) Projects are frequently managed centrally with only very long term plans for local management even when local management is supposed to be an urgent goal. (465, p. 2) There seems to be a perception of duality of government and people, educated and ignorant, that leads to the assigning of an active role in development to the government and the educated while a passive role is assigned to the people, the acted on. (461, p. 324)

There are many reasons for this centralized approach to the management of rural development. Socialist ideology and distrust of individual economic activities are one reason. Another is urgency. It is argued that there isn't time to work with peasants long enough to find out what they want. Instead, rules should be developed that work for most farmers and then the farmers should be told to follow these rules. (405, pp. 116-117) Administrators find it easier and more desirable to develop one large project than many small ones, regardless of the inappropriateness of large, centrally planned projects for small farmer conditions. (388, p. 78) Some governments simply don't want development from below. (234, p. 16)

The belief that farmers are ignorant and resistant to change seems to be the basic reason for resisting farmer participation and is especially widespread. In India, for instance, headquarters staff felt they knew better than the farmers what the farmers should do. Partly because the extension workers had very simple training, the tendency was to draw up a list of desirable practices and have the agent attempt to persuade as many farmers as possible to accept them. (182, pp. 68-69; see also 234, pp. 14-15; 475, p. 37) Often it is felt that because farmers don't know the answers or can't define the answers or won't accept the answers from the extension agent, they must be manipulated into acceptance of the known solutions by those who do know. Their psychological resistance must be overcome. These themes are prevalent in Africa, Asia and Latin America. (231, pp. 69-70; 467, p. 262)

E.B. Rice, for instance, argues that "subsistence farmers can neither identify nor solve their real problems" since neither they nor their leaders know the alternatives available nor can they "originate a request for a short, stiff-stalked high response wheat." (296, p. 127) He could not believe that Program Building could be anything but "a way to encourage farmers to accept a development program already described on a sheet stuffed in a change agent's hip pocket, not as a way to develop the program." (296, pp. 127-128)

In practice, extension agents often not only do not know the problems but often don't have workable solutions for the problems they do know. (462, p. 59; 476, p. 35; 68, p. 51) Extension agents have repeatedly tried to get farmers to grow crops for which there was no market, use inputs which were highly risky and not nearly as effective as the agent claimed, and use cultivation methods that required much more labor at times when labor was fully occupied. These failings are obscured in Latin America where many of the extension successes are with high value crops or disease control, i.e., where proven and packaged solutions to particular types of farm problems are available. However, even Rice admits the attempt to push technical packages on small farmers has not been successful in Latin America. (296, pp. 333-344) He also concludes that a major failure of extension in Latin America was the failure to base it on feasible, profitable technologies. (296, p. 429)

Farmers, however, do know what their problems are although it may be necessary to dig for this information. Often extension agents will ask a question, get a response and leave the matter at that. Instead, the agent needs to ask himself why such a response was given and probe deeper to discover how and why the farmers' perceptions differ from his own.

Although farmers may appear reluctant to change, they usually can sum up whether a change is worth their while or not. (75, p. 18) In Niger, for instance, a farmer-instructor challenged extension agents who were trying without much success to teach classical farm improvement techniques -- fungicides, row sowing and good density -- to teach the farmers how to get the results a European

in his village was getting. The European was relying on soil restoration techniques completely unrelated to fungicides and row sowing and the farmers knew it. (477, p. 26) As the farmers put it, "the soil is dead." (477, p. 25)

An extension agent in India was told to spread cottage industries to provide employment in an area where embankments protecting against salt water intrusion had decayed. However, when he asked the villagers what they needed, they replied they needed leadership and money to rebuild the embankments. An ad hoc organization was formed to rebuild and maintain the embankments and soon there was plenty of farm work. (208, p. 5)

At Daudzai, it was found that farmers could not only identify problems but could also suggest solutions. Often they could suggest the outlines of a solution that engineers could then develop technically. (37, p. 8) An extreme case of this was the Ecuador situation described above where simply going out and listening to people was enough to get a project started. Both the information collection and the knowledge demands on the agent were reduced almost to nothing.

This is the opposite extreme from what seems to be the ideal in most extension theory: a highly trained extension agent and economic and sociological surveys and research to try to figure out what can be done in agriculture and how the farmer thinks and why. Thus one observer recommends staff training in the ability to "read" the society in which staff are working. This would develop the ability to analyze various aspects of society (technology, economics, kinship, power, values and worldview) in order to discover trends in their development. The Shell projects and the Daudzai Project in Pakistan did intensive and extensive, professionally supervised surveys which took eight to twelve months. (464, p. 16; 37, p. 6)

Whether training sufficient to allow an agent to "read" a society in the above sense is possible or practical is doubtful. Conventional economic theory, for instance, has not provided the tools needed to develop a realistic picture of village economic life because farmers do not distinguish between production and consumption outlays. (259, p. A70) Tribal societies are even more complex in their economic motivation. Some work has been done on how non-Western peoples look at economic issues.1/ These are outside the mainstream of economics, however, so they are unlikely to be taught to extension agents.

Similarly, most developing countries would find it impossible to conduct the intensive, professional surveys used in Shell projects and at Daudzai on anything but an intermittent basis. They are too costly of both time and trained manpower. Even when such surveys

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1/ See, for instance, 467 and 62.

are conducted, they can be inaccurate. In one case a farmer was classified as modern or progressive in a survey when his behavior was traditional. It turned out that he had given the answers he thought the researcher wanted to hear, a not uncommon occurrence in Africa and elsewhere. (231, pp. 163-164)

What the experience of cases like Program Building and the Niger projects discussed above show is that such extensive training and costly surveys are frequently unnecessary. Such training and surveys are to provide information and insight to the extension agent. The agent, however, needs this information only to the extent that he is making decisions for the community. To the extent that the community makes its own decisions, they can make the decisions on whatever information satisfies them. Thus there are three tremendous savings in information needed in letting or getting a community to make its own decisions: (a) the community already knows much of the information collected or studied in training or surveys; after all, it is the source of the information; (b) the community can made a decision on less information than would be safe for an extension agent; the community knows when it is satisfied; the agent must overstudy the community to make sure, if he ever can, he has all the facts needed to make decisions that satisfy the community; (c) the process of data gathering and priority setting the village goes through provides the agent with direct information on what the community feels is important; it is their decision so he need not try to make inferences about it, the guess work is eliminated. (231, p. 178)

In Rio Grande do Sul in Brazil, for instance, a dialogue has grown up between farmers on one hand and extension agents, university scientists and students on the other because the latter went to the area to seek information; e.g., soil testing, before trying to give advice. Now farmers are coming to them with a wide range of farming problems. (59, p. 31) Not knowing everything may raise the agents' standing rather than lower it. A Shell extension agent in Nigeria selected a sample of individuals from the tax rolls for his survey. When these names were read at a meeting, it turned out that some of the people listed were dead or insane. This revelation reduced the fears of the community that the government or project had some sinister intentions. (63, p. F47)

Decision making by farmers and communities is important because, when done correctly, it works. Programs are more successful when farmers participate than when they don't. The reasons for this do not seem to lie in the role farmers play in discovering solutions, although they often do, but in their defining problems and priorities. When someone says subsistence farmers cannot identify their own problems, he is simply wrong. They can and do.

What is needed is for the extension agent to be prepared to go to the community as a student as well as a teacher. After the village has informed him of its needs and priorities, then he can try to find ways to bring outside expertise to bear on these problems and try to integrate such expertise into village life. (478, p. 52)

7. Objectives of Problem Solving Extension

One of the criticisms of the Program Building system described above was that the system was so dependent on the personality of Ben Ferguson, the person who started it, that it failed when he left and has been unworkable without him. But as we have seen, the same types of program succeeded elsewhere with other people. At Leribe, Lesotho, this approach was successfully introduced into a larger, less successful program by a single individual present only for a few months. In fact, the technician's reason for working more closely with the people and keeping things simple was the knowledge that he would only be there a short time. (See section above on Problem Identification and 63, pp. E12-E24) Personality clearly had little to do with the success here as the one favorable personality left, leaving the program in the hands of those using an authoritarian -- and unsuccessful -- approach for other activities.

The principles Ferguson used are principles that were found to work in many projects. He was successful, not because he could do things other people found impossible, but because he could get other people, like extension agents, to work on the basis of successful principles. This meant getting the agents out of their offices and into the fields. There they were to find out what the farmers needed and later to implement the Program Building procedures for finding and solving the farmers' problems.1/

Where Ferguson failed was not in his extension method but in his inability to get his ideas institutionalized in the local bureaucracy. The bureaucracy of the Indian subcontinent had a strong belief in education and the need for the educated to tell the uneducated what to do. Problem-solving extension went against this grain. Ferguson did not try to adjust or enlighten this bias. On the contrary, he was rather proud of his fights, often successful, with the bureaucrats. Unfortunately, this meant officials and even many of the extension agents found his views not only unacceptable but also incomprehensible. As long as U.S. support and Ferguson's forceful approach were present, the system worked. When he left, the failure of the system to accept the problem-solving principles and their implications for changed work styles, meant the steam went out of the effort.

1/ The author once asked Ferguson what Ferguson felt his role was in working with the extension services. Ferguson replied, "a sharp stick." Once on a boat outing and picnic, his family and mine went ashore to find a picnic spot and Ferguson disappeared. Since the site was unsuitable, the rest of the group began looking for him and found him several hundred yards away talking to some farmers. As we walked back to the boat, he talked forcefully about the failure of the local extension agent to visit the farmers he had just talked to and how the agent would hear from him on Monday.

As discussed above, one of the reasons technical extension works is that working within the confines of a single crop and a producers' association makes things simpler. The situation defines a clear objective for the extension agent and a clear idea of who his clients are. A difficulty with problem-solving extension is that the objective is less obvious and who the clients are is harder to define. Ferguson was successful because he had a clear idea in his own mind what his objectives were and who the clients were and he was able to convey this to extension agents. In most cases, however, it is not possible to rely on the existence of a forceful individual. Nor is it desirable to do so. This reliance was the biggest weakness of Ferguson's work.

What is needed is some way to get an entire extension service to adopt these methods as operating procedures. In practice, the circumstances that fostered a problem-solving approach in the above cases were ones of considerable autonomy for the local staff. The Shell agronomists consistently had a high degree of autonomy in selecting and carrying out their activities within the context of the overall method. At Leribe the one component of problem-solving was in an activity where the technician operated independently of the rest of the staff. The staff of the Akoliufu Pilot Project had a great deal of freeedom to select crops, activities, participants and forms of organization. Although the organization of farmers at Puebla was less complete and less successful, what there was grew out of the experimentation allowed the project.

That relative autonomy is a condition of successful use of problem-solving extension is not surprising; to problem-solve one must be free of the requirement to promote a particular technology. But this simply indicated when problem solving approaches have been <u>discovered</u> under conditions when technical extension was not required. Thus permission to problem-solve is a necessary condition but is not sufficient to guarantee that a whole extension service will use this method. If the extension service is to use this method, it must be trained, organized and have objectives that lead agents to help farmers solve problems.

The type of training that is required is one that provides agents with practical skills; they must be able to comprehend both the farmers' problems and the scientists' solutions and explain the one to the other. The need for and methods for developing these abilities is discussed in the Training chapter.

Organization for problem-solving by farmers means first that any necessary organization by farmers and work by agents with farmers' groups is both legal and encouraged by the government. Second, the organization of the extension service and research must also support work with small farmers and farmers' groups. Research personnel and organizations and other sources of information must be prepared and able to work and coordinate activities with extension and vice versa. These issues are discussed in the Training chapter and later in this chapter.

Finally, the extension service must have a clear idea of what they are trying to accomplish and must believe that it is possible. Thus the agent, like the technical extension agent, will be much more effective if his job is clearly defined and understood and he is clear as to who his clients are. In problem-solving this is not as easy to achieve as in technical extension.

In problem-solving extension, it is the farmers' objectives which determine the activities of the extension agent. This is true of work with large scale commercial and small scale subsistence farmers. Since there are so many small farmers for each extension agent, in practice these farmers have been grouped so that common problems can be dealt with for many people at once. Since organization is often necessary for working with small farmers, it is important that the agent know whether his intended clients are small or large scale. His job will be different in the two cases. If problem-solving extension is to be fully effective, the government must establish who the clients of the extension system should be. Further, this information must be effectively conveyed to extension agents and their supervisors.

C. Technology for Problem Solving

Frequently it is suggested that innovations must be conspicuous if they are to be accepted and that it is easier to introduce something entirely new than to improve existing techniques. (229, p. 62) This is often true; farmers are often more conscientious about following recommendations for a new cash crop than for their traditional food rops. This has led to the conclusion that a package of practices is what is required to introduce innovations into traditional agriculture. The package should start the change process and other, smaller changes, e.g., better weeding or spacing, more timely planting, can then be introduced gradually. The World Bank suggested this approach to Tanzania.

1. Small Steps

In Taiwan, however, many years of using, and frequently changing, improved varieties of traditional crops preceded the use of high yielding varieties. The Taiwanese farmer was thoroughly familiar with and used considerable fertilizer. He was a commercial farmer with a full range of agricultural services available to him. He was a highly disciplined farmer who trusted and reacted quickly to most extension advice. Finally he was supported by a thoroughly developed system of irrigation and drainage. Thus, adoption of high yielding varieties was not a big step for him. The same was true in Japan.

Sri Lanka adopted a strategy of introducing improved varieties of traditional rices. An improved traditional variety demands less cash for fertilizer, less discipline on the part of the farmer and less risk than a high yielding variety. Thus, it is more easily used by small farmers. Sri Lanka also made services available to

these farmers and as a result 72 percent of the main rice crop of 1969 was grown with these improved varieties and yields increased rapidly. It is hoped that this will lay the basis for the adoption of more advanced technical packages later.1/

In the Shell project at Uboma in Nigeria, a small number of extension agents obtained excellent results with small farmers. In ten years they introduced new technical packages for rice, palm oil, maize, animal breeding and in other areas. But in each case this was done by identifying a local problem and then finding a solution that could be adopted to the problem from research institutions in Nigeria. This possible solution was first tested on a few demonstrators' farms, and, when proven, extended to the whole community. (417, pp. 209-210) Similar successes have been achieved at other Shell projects.

In China virtually all research in agriculture was directed towards solving practical farm problems rather than developing new technical packages. This not only meant bringing scientists down to the farm level, it also meant making major efforts to expand farmer knowledge and to encourage farmer experimentation. This did not prevent or restrict agricultural advance. Not only do the Chinese have their own high-yielding varieties of rice, they also made extraordinary gains in multiple cropping. (479, pp. 6, 9, 24-25)

In Kenya there was considerable skepticism about government programs in rural areas due to inflated promises and deflated performance on previous programs. To prevent further overestimations of future benefits, the Special Rural Development Program in Kwale district introduced, in a step-by-step sequence, projects that the community felt were important and that had highly visible and immediate results. This worked so well that in one water project it became possible to rely on self-help labor for digging trenches rather than on the hired labor originally planned. It was then recommended that this sequential approach be used in other SRDP districts. (231, p. 163)

In Chile, medium and large growers entered contract farming relationships with little awareness of contractual requirements or possible sanctions for non-compliance. They regarded the practices required as recommendations they voluntarily followed. Small farmers with little previous experience with modern technology often resented and resisted such requirements. They frequently claimed that fertilizer usage levels were too high or that sowing times were bad. However, this was more true of new participants than veteran growers. (296, p. 506)

1/ This approach also had desirable social effects as well. Instead of concentrating large increases among a few farmers -- the better off ones, it has spread smaller increases over many more farmers. (61, p. 100)

Part of this pattern seen in Chile may be due to the fact that for large farmers the contract was voluntary and for the small farmers it was a condition of getting land. The reduced resistance to the new practices may have been due to acceptance of bureaucratic control. Finally, some complaints may reflect actual errors in extension advice. Through all these examples, however, comes the idea that technical packages are accepted most easily by those farmers who (a) are used to modern technology and (b) have been commercial farmers. Even more important, farmers become familiar with modern technology and commercial farming more easily by a series of small steps than by the adoption of a whole new package.

2. Building on Success

Another aspect of building on small steps is building on successes. An extended series of changes in another area in Kenya began with the use of a local pineapple canning factory to can tomatoes. One village planted 20 acres the first year. The next year three villages planted a total of 100 acres. At this point early varieties of tomatoes had to be introduced to adopt to the cannery's schedule. But early varieties of tomatoes required irrigation and this led to the construction of a pipeline to pump water from a nearby river. This was followed by the expansion of the use of irrigation and the introduction of more irrigated crops. (388, p. 112) It is unlikely anyone could have predicted or planned such a sequence as a package. Fortunately a package was unnecessary as success led to success.

In Ghana the Biriwa Project began by selling fishing gear, equipping a repair shop and training mechanics to repair outboard motors for fishing boats. Outboard motors were sold on a rent-purchase basis. From there the project grew as new ideas developed, new needs were discovered and resources grew. A new way of mounting motors was discovered. Lobster traps and underwater lights were introduced for off-season fishing. A carpentry shop was started and then a furniture sales store. Construction block was produced and a roof repair program launched. Training programs for carpentry, masonry and other skills were introduced as necessary. Community development efforts and revitalization of the Village Development Council were stimulated by the collapse of the primary school's roof. A new school was constructed, community toilet facilities were built, a clinic and two houses for nurses were built, the middle school was renovated and street lights were installed. Not all project efforts were successful but because the failures were experimental, they were not fatal to confidence in the project. Other communities began asking for help to establish similar programs. (63, pp. C33-C35) This project was successful in a great number of activities by building on their past successes and solving problems as they arose.

The key to building on successes is a sequence of activities in which earlier steps provide either the knowledge, confidence or financial surpluses necessary to go on to further steps. (477, pp. 26-27) For instance, the judgment of slope skills developed in contour plowing can be applied to laying out irrigation ditches.

The building of a road may increase farmer returns and ability to invest in his farm by cutting transportation costs and allowing him to bypass a middleman and sell directly to a town market; it may also increase demand for his crops and make him more accessible to extension agents. (43, pp. 120-121) In East Pakistan farmer marketing of produce expanded greatly following a rural public works road building and improvement program. In Mali, farmers adopted new techniques that enabled them to increase their productivity per hectare and the to purchase implements for increasing the acreage farmed. In Kenya farmers used surpluses from potato production to grow pyrethrum and surpluses from pyrethrum to start cattle raising. (43, pp. 36-37, 120-121)

Another aspect of building on success is to start with the technology farmers already have. In Turkey, western experts urged farmers to remove the flat stones from their fields so mechanized equipment could be more easily used. The farmers resisted this as they felt it would reduce moisture retention in their soils. When the stones were removed, this turned out to be correct and removal had to be discontinued.

At Puebla in Mexico it was found that maize and bush beans grown together were more profitable than either crop grown separately. In spite of almost universal preference for single crop cultivation by experts, the farmers knew what was best in this situation. (271, p. 15) Another traditional practice that was questioned by the Puebla experts was plowing in the fall. The research staff felt that as there was little weed growth during the winter, there should be little moisture loss and that fall plowing would encourage wind erosion and the mineralization of the small amount of organic matter in the soil. In practice they found strong evidence that the moisture content of the soil and seed emergence in the spring were both reduced when the traditional fall plowing was eliminated. (271, pp. 22, 24)

In many cases, extension activities can build on successes, or even on what appear to have been failures, in the past. For instance, in Kenya unsuccessful cattle dipping and range management schemes of the 1950s and '60s seem to have prepared the people for more recent development efforts. Failures of this type may not be due to the incorrectness of the idea as much as the way the people were approached or the state of their development at the time. The ideas presented may germinate to bear fruit much later.

One implication of taking such small steps is that it may take several years before farmers move through a series of steps to achieve an even moderately profitable technology. In Mali, for instance, the extension service for cotton expected it to take over five years to achieve a rational balance between cotton and food crop production when cotton was introduced. It would take two to three years for the farmer to adopt the cotton package. After that it would take one to two years to adopt animal traction and thus increase cotton acreage. Finally the farmer would adapt the new methods he has learned for cotton to food production. Then he would

enter a phase of learning to adapt food production to changing market conditions for food crops. On the basis of experience elsewhere, it seems that five years is optimistic but at least it has been recognized that farmers will adopt the package only a piece at a time.1/

As became apparent in the Leribe Scheme in Lesotho, there is a trade off between increasing overall output quickly and building up the farmers' capacity to adopt changes. (63, p. E21) Packages frequently are complex and highly profitable for the larger or more commercial farmers that adopt them. Farmers who are unfamiliar with modern technologies or commercial farming, however, need a series of steps leading into such packages. What the farmer learns in one step makes choosing and understanding the next step easier. What the farmer earns in one step makes financing the next step easier. (464, pp. 21-23; 433, pp. 221-224) Finally, the self-confidence and the confidence in the extension agent gained from one success makes the farmer more eager to go on to try something else. (433, pp. 221-224; 480, p. 110)

3. Role of Technical Packages

The foregoing marks a major difference between technical extension and problem-solving extension. Technical extension is built around a proven technology. This may be a complex technical package such as for tea growing in Kenya or Nigeria or a fairly simple one such as a disease control program. In any case the technology is developed and proven prior to presentation to the farmer.

Problem-solving methods of extension, however, almost never depend on a particular technical package. None of the cases above, for instance, involved a particular technical package. The case of cooperative development in Niger did not involve a particular model of a cooperative. One study of ten projects having high involvement of the people in the project area found that eight of these began with a series of discussions to select project activities. Only two started with a particular new technology and both had to be tested further on the farmers' land. (417, pp. 102-103)

Thus there seems to be a contradiction. Technical extension has been based on introducing technical packages and has been successful. It has led some to conclude that packages are the best way to get change started. However, this is the opposite of the approach used by Shell and others in their successful projects. It

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1/ A study of two villages in Mysore, India showed that the average time between a farmer's first becoming aware of a new technique and adopting it for his own use was 7.2 years for improved seed, 5.1 years for chemical fertilizer and four years for the Japanese method of paddy cultivation. (90, p. 25)

is the opposite of the strategy used in China and Sri Lanka and the strategy that was responsible for the successful development of Taiwan and Japan. It is also contrary to the evidence of widespread failure of farmers to adopt technical packages, or, if they adopt the package, to do so only partially. At Puebla 75 percent of the parcels using new practices had a low level of adoption of at least one of the three main practices recommended. (271, p. 85) In Ghana, some farmers adopted a technical package for maize for only a part of their crop even though yields doubled. These were progressive farmers who had started their own cooperative which had a joint hog production project. (63, p. C28) Even in a fairly advanced agriculture such as that of South Korea, there was a consistently low rate of adoption for some practices for rice, barley and wheat. (403, p. 523) Using less than the recommended quantities of fertilizer is especially common. (296, p. 337; 481, p. 15)

One reason for this apparent contradiction is that technical packages are more easily accepted by those with previous experience with modern technology and by those that are commercial farmers. Beyond this, however, the big factor seems to be whether the crop being grown is a commercial or a subsistence crop.

In India, for instance, Scarlett Epstein found farmers that were extremely progressive in their cultivation of sugarcane which was a new cash crop for them. The same farmers were very conservative in their planting of rice, a subsistence crop. In a nearby village which lacked irrigation for sugarcane, however, farmers used modern rice cultivation methods. For them rice had become a commercial crop. (482, pp. 39-41) Even large farmers seem to have different attitudes towards cash crop production and subsistence production. Farmers are sensitive about costs and prices for cash crops but not for subsistence crops. (483) This distinction in behavior is found all over the world (234, pp. 30-31)

One reason for this distinction seems to be attachment to traditional ways. Epstein concludes that it was customary systems of payments for farm labor that led to the differences she found in India. The sugarcane farmers were growing rice with their traditional farm labor but the commercial rice growers rented land and hence could select and pay farm labor to do new things. (482, pp. 39-41) In Gambia, women who had previously grown vegetables did not follow extension recommendations as closely as women growing them for the first time. (63, p. B35)

The major reason for the failure to adopt packages to subsistence crops, however, is that it does not make sense to the farmer to put cash inputs into a crop that will not produce cash income. (234, p. 31) On the contrary, since the new methods almost always require more labor at critical times of the year, e.g., 60 percent more at Puebla, the new practices would cut into off-farm work and hence would reduce cash income. (399, pp. 107-108, 124) Additional labor may be unavailable or costly. (38, p. 224; 229, p. 30) In fact, in cocoa areas in Nigeria and tobacco areas in Tanzania, farmers shifted towards subsistence crops that require less labor rather

than more in order to reduce labor demands in peak seasons. (307, p. 15) Substantial cash and labor outlays also raise the risk associated with a new technology. (205, pp. 12-13; 63, p. H20) Further, many farmers refuse to invest in food crops, as in Zambia, when cash crops provide a greater and more secure return. (476, p. 35) Where food crops are profitable, however, farmers welcome technical assistance and use modern supplies to grow them even when they also grow other high value crops, e.g., in tea areas of Kenya, and tobacco areas of Tanzania. (231, p. 29)

Technical packages have worked best in the same conditions in which technical extension has worked best -- where high value commercial crops are being grown and farmers have previous experience with modern technology and commercial production. Technical packages have not been as successful for subsistence crops, especially if the cost of inputs is high. An exception to this is when the package has been sufficient to turn a subsistence crop into a cash crop as happened with some high-yielding variety programs for medium and large scale farmers. For small subsistence producers even significant increases in yield are often not enough, considering risk, high input costs and loss of alternative employment, to justify commercial production. Subsistence producers' cash crop possibilities are also limited. For these people the road to improvement must be the hardest one of all: improvements in the context of subsistence production. For these people a problem-solving approach or a job off the farm is the only hope.

4. Explaining New Methods

One author used an example of superphosphate use by Indian peasants as an argument for the need for the peasants to understand the "biochemistry of fertilizer effects." The peasants found that superphosphate helped so they put on more and more until they damaged the crops. The author concluded that peasants need to be educated in "the scientific reasons why an innovation has its desired effects." (480, p. 247)

Understanding of an innovation does not mean scientific understanding, however, it means practical understanding. The attempt to explain new practices in scientific terms is usually a failure because the people have no basis for understanding it. People find it easier to understand and to adopt an innovation when it maintains connections with what they have known in the past as only then can they judge and compare it. Farmers have in most cases inherited a technology that has proven worthwhile and often surprisingly reliable. It has sustained the farmers for gene tions. Thus it is useful to try to turn traditional methods to new purposes. (467,

p. 336; 484, p. 165) It is best to offer a new practice as an improvement of the old, as something that builds on the past rather than as a replacement for the past. (459, Appendix, p. 24)1/

In Niger, a "barefoot doctor" program using illiterates was successful largely because it was based on existing knowledge. In village meetings to discuss health problems it was found that the villagers could give surprisingly accurate descriptions of up to 20 different diseases that they encountered. They could also set out the traditional cures for these diseases and which diseases they felt could only be cured by modern medicine.

In training, explanation of diseases began with the knowledge the villagers already had of the main diseases of the area. What was right in this knowledge was confirmed and what was wrong was corrected. Explanations were reenforced with a 10-page booklet with pictures summarizing the main conclusions of each lesson. This knowledge became the basis for diagnosis and then either treatment by the volunteer or referral to the clinic. The medical results of the program were very impressive, especially concerning eye diseases and malaria. Eighty health workers were soon handling over one third as many patients as went to the eighteen dispensaries. (423, pp. 7-12)

The function of fertilizer can be explained by analogy to the food or, if the farmers are more sophisticated, the vitamins and proteins needed by the human body. The need to make sure that the proper amounts are applied can also be explained in this way. The farmers need these basic explanations so that the new practices will not be a mystery and so they will not make naive errors such as assuming that if some fertilizer is good, more is better. (This type of explanation has worked very well in Mexico and in many other places.) (459, Appendix, p. 24)

Another aspect of building on existing ideas, and hence respecting holders of these ideas, is illustrated by the games developed for an informal education project in Ecuador. A number of these games were direct modifications of popular, local games. Often some of the rules, especially on the resolution of disputes, were left to the players to work out in accord with their own customs. These games incorporated several local value judgements: that

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1/ Some authors have adopted this approach. Instead of directly introducing their subject in scientific terms the reader may be unfamiliar with, they begin with traditional concepts and gradually bring "them into line with contemporary ideas, so as to facilitate the gradual assimilation of concepts which otherwise might remain partially incomprehensible." (485)

school provides little benefit for rural dwellers but more useful educational options exist; that property ownership and improvement is necessary to improve the present situation; that working together is crucial; that information is a valuable source of power. (391, p. 50) Although these judgments were shown to be consistent with those held by the campesinos, a conventional approach would have been to modify them, especially the low opinion of schools, because the peasants "shouldn't" feel that way. Because the values were genuine, however, the campesinos played the game widely and repeatedly. This led to greater awareness of their condition and is associated with successful community development projects and with greater participation in literacy training. (391, pp. 23, 62-64)

Once the farmer understands the basic principles of the new practice, even if only by analogy, the next step is to provide an initial recommendation, e.g., the amount of fertilizer and when to apply it. In giving this it should be emphasized that such recommendations are based on experiment and are not hard and fast rules. The farmer may have to try more than one combination to see what works best. The farmer needs to know that this is an experiment and that his own observation may be just as important to getting a good crop as the agent's recommendation. Science needs to be demystified.

Where this has not been done and farmers have not understood what was happening, they often come to peculiar conclusions and make what seem to be strange errors. They become frustrated with the new technology and give it up. In Chile, for instance, colonists were introduced to new practices for maize with little concern for either farmer needs or understanding. The result was that farmers said they did not know about hybrid corn even though they were using it. Many did not know that the hybrid seed had to be renewed, i.e., purchased from a hybrid seed producer each year, rather than sowed from the previous harvest. They reacted to the new practices as if the crop was not theirs and they were just hired labor, as they had been before becoming colonists. (296, p. 507)

At Magumeri in Nigeria government officials, the local school teacher and an extension agent all tried to induce the farmers to adopt superphosphate fertilizer. No attempt was made to find out what the farmers wanted. In fact, at no time did the farmers voice any dissatisfaction with their yields using traditional methods. This lack of dissatisfaction over yields and the complaints farmers did voice were both ignored. No attempt was made to explain the use of superphosphate in terms the people understood. On the contrary, the foreign origin of the fertilizer was emphasized. The Agriculture Officer began by giving a talk to a large group of people at the district capital emphasizing the superiority of European technology, e.g., cars, radios, airplanes and the superphosphate that had been distributed the previous three years. The superiority of the "wonderful" European fertilizer was also emphasized by the school teacher and others in later meetings with farmers.

The extension agent organized demonstrations on farmers' land. Many farmers were pressured to volunteer for this; few volunteered spontaneously, even though the fertilizer for the demonstration was free. In addition, the extension agent insisted on one-acre plots, often leaving parts of a single field out of the demonstration for no reason comprehensible to the farmers; this only increased the foreignness of the whole procedure and convinced the farmers that European technology did not apply to them.

Output on fertilized plots compared to adjacent unfertilized plots was, on the average, 30 percent greater for millet and 35 percent greater for groundnuts. In spite of this there was nearly universal disapproval of the fertilizer. Instead of volunteering to purchase, at nominal prices, superphosphate for the next year, many of the farmers spoke out sharply against the fertilizer. They argued that the areas where the fertilizer had worked in Nigeria had different soils and though it was not entirely useless it was impractical in their area. No farmers spoke in favor of the fertilizer or mentioned the successful demonstration plots. (486)

Other examples of failure to understand and really accept a technology took place in a Philippine program to encourage people to build modern toilets. One farmer was induced to build a toilet because the extension worker convinced him that his pretty daughter might fall prey to snakes is she went into the bushes at night. However, only the daughter was allowed to use the toilet. One farmer was induced to build a toilet because an American visitor was coming to the village. After the visitor left, the farmer locked the toilet up until such time as future visitors would come. (487, p. 283)

Building on existing knowledge does not mean confining extension to traditional technology. Researchers at Ahradu Bello University in Nigeria, for instance, have begun improving traditional farming methods. (337, p. 38) New technologies will be introduced gradually. Building on existing knowledge requires a step-by-step approach that lets people understand what they are doing rather than the avoidance of new technologies.

Nor does building on existing knowledge mean trying to preserve an existing culture. It is highly doubtful if any system of extension or no extension at all would preserve traditional cultures as they are. Traditional society is rapidly disappearing everywhere. Some say this is because people no longer want to live by the old rules. (390, p. 14) Others say it is due to encroachment by outside influences. In any case building on existing knowledge will make the changes easier and more understandable to the participants, perhaps faster, and certainly less painful.

D. The Phases of Extension and Rural Development

As we have seen, the poorer farmers in a community tend to get most of their information from other community members. At the same time, these are the farmers most threatened by the uncertainties of major new technologies. Hence, in practice, the

approaches that have worked the best in promoting change among such farmers have used other farmers to spread techniques and have started with simple steps, e.g., often with the best practices of the community's traditional technology, rather than trying to introduce a complex and totally new technology.

Meanwhile, commercial farmers may change crops, technologies and even sources of information in a single year. Such farmers often bypass extension services entirely and go directly to researchers in order to get the latest information on their crops. Large farms may even have their own research and testing personnel as on the rubber plantations in Malaysia.

What this means is that there is no best type of extension. The level of skill, recruitment methods, pay and benefits, organization, technology, method of extension, and subjects extended will depend on the level of development; crops; scale of farming; climate, land and water conditions; and level of development of the farmer. As farmers become more commercialized, the extension system will change, gradually becoming more homogeneous as farmer conditions become more homogeneous. Initially emphasis will be on gaining farmers' trust, farmer organization, problem solving and assuring access to inputs. Farmer to farmer contact will be important. Gradually extension workers will become more professional. Farmer extension workers will become full-time professionals. Professional extension agents and researchers will have more direct contact with farmers. Much more emphasis will be placed on technical skills and farm management. (234, p. 16, 32; 97, p. 319)

One way to assure service to small farmers and to conserve the scarce manpower that can successfully work with small farmers or that has advanced technical training is to provide for two types of extension service, one that is technique oriented for commercial farmers and one that is organization and problem-solving oriented for small and non-commercial farmers. (488, pp. 34, 43) Senegal, for instance, had different programs for these two types of farmers, but once again the more progressive farmers got more intensive treatment. (399, pp. 127-128)

When the need for different types of extension for different types of farmers and conditions has not been recognized, extension services have failed. In Latin America, for instance, adoption of extension systems based on the U.S. model have been of little help in agricultural development. (306, p. I35; 296, pp. 417-425) Inappropriate foreign models also threaten African agriculture with a too rigid and narrow viewpoint contrary to the flexibility and experimentation that rapid changes in farmers and farm organization require. (231, p. 173)

The most successful extension has been in countries, such as Taiwan and Japan, where there was considerable revision of extension and research methods. These countries did not wait for the development of a professionally trained cadre of extension and research

workers. On the contrary, they began with farmers extending the best practices of the existing technology. Even today extension is largely controlled by the farmers. Farmers were responsible for some of the most crucial, agricultural innovations. Today research and extension are fully professional. If agricultural professionals have less education than is typical of some developed countries, that only shows that lower levels of education are appropriate in countries where density is great and farmers responsive. The evidence is that these countries have done an outstanding job of matching extension services with needs for three to five generations.

Finally, some people will feel that basing efforts, especially learning and organization, on current practice and experience rather than modern theory is a backward step. The university offers what is most up to date and hence offers the shortest route to modernization. They may feel all this effort to organize farmers and get them involved in problem selection and problem solving is a waste of time. People that hold these views may be interested in the views of a current management theorist talking about the needs of the modern, he calls it matrix, organization:

> The university has typically assumed that learning (a) is for the individual, (b) occurs when it is given, (c) is tested by contrived examinations of the knowledge acquired, (d) need not be relevant to any immediate problem, (e) should be designed and controlled by the educator; it is the task of the educator to define the problems, develop ways to solve them and define the criteria for evaluation -- who passes and who does not. The matrix organizations require education that (a) focuses on individuals in team systems and (b) it occurs where the problem is located, (c) is learned by the use of actual problems, and (d) is tested by the effectiveness of the actual results, and (e) is controlled by those participating in the problem (aided by the educator as a consultant). (489, pp. 203-204)

E. Farmers in Extension Work

A difficulty of extension is that a one-to-one relation between farmer and extension agent means extension is an extremely expensive way of dealing with large numbers of small farmers. In the United States, for instance, a local agent covers about 1,000 farms of which about 500 are run on a commercial basis. If these 500 farms all have 160 acres or more, as is typically the case, then an agent covers at least 80,000 acres of commercial farms alone. On the average he need raise output only a few pounds per acre each year in order to justify his salary. If the farms were only two acres, however, and again he dealt with 500 of them, he would have to raise output 80 times as much per year to justify the same salary. Developing countries do not pay their extension agents as much as U.S. agents are paid but neither do their extension agents work with as many as 500 farmers. The problem is that output varies roughly with

the amount of land but the extension input varies with the number of farmers. Hence, extension services tend to become larger and more expensive when farms are smaller. Or, there are simply not enough extension agents to cover all or even most small farmers. (231, pp. 68-69)

One way of spreading professional extension agents over more farmers is to enlist non-professionals, usually farmers, to assist with the extension effort. (388, p. 71) At the simplest level farmers carry out demonstrations. At a more advanced level certain farmers are selected as model or progressive farmers to give instruction to fellow farmers on the benefits of new techniques and how to use them. Model farmers usually received some formal training. (490, p. 6; 360, pp. 47-48; 268, pp. 113-114) Rural people may become problem solvers or rural "activators." Finally, local farmers or other para-professionals may be formally incorporated into the extension services. The success of these various forms has depended largely on the type of extension process, technical or problem-solving, used.

1. Demonstrations

The use of demonstrations has been a key factor in many extension programs. In Ghana, one successful program identified those farmers who were thought to be the most progressive. These farmers were induced to try out innovations on a small piece of their land. These innovations were simple, within the financial capability of the farmer and had been tested for at least two years at local experiment stations. There was frequent extension contact with these farmers and their village. (63, p. C7) Expansion of tea plantings in Kenya proceeded largely from farmers observing other farmers who already grew tea. This observation not only led many farmers to want to grow tea but also taught them a great deal about tea growing. (63, p. D38) Israeli extension in a Zambian vegetable growing project was successful after many of the farmers tried the new practices on small experimental plots on community common land. Thus the risk for these farmers was low and they actually did the demonstration for themselves. (476, p. 37) The Shell projects, Puebla, Program Building and many other programs all used demonstrations as a part of their extension programs.

In Nigeria demonstrations were arranged by providing all necessary inputs and instructions in small kits. This reduced problems of measurement and provided all of the necessary inputs together. One farmer in each village was selected by community leaders to receive the kit and conduct the demonstration. Each kit contained four improved varieties of maize and one local variety. Thus each demonstration was also a field test of the four improved varieties. The demonstration fields were frequently visited by not only the extension agents but also by researchers who had helped develop the varieties. These researchers discussed problems and results with both farmers and extension personnel. Adequate markets and increased production is making maize an increasingly important cash crop in Nigeria. (491, pp. 4-5) Kits have also been used in demonstration programs in other countries.

The use of demonstrations has many advantages. At Puebla the agronomists found that in spite of the good rapport they had developed with the farmers who had high-yield plots, the farmers who visited demonstrations were much more at ease and more willing to raise questions with the farmer-demonstrator than with the agronomist. The agronomist helped by providing additional information and by showing that he thought the demonstration was important. (460, p. 73) Farmer demonstrations also served to field-test practices under actual farmer conditions. (460, p. 70) Demonstration plots and other field experiments are a way of starting small and working up to larger scale activities while protecting both farmers and extension agents against the risks of failure. (75, p. 18) In Vietnam, for instance, a number of innovations pushed by extension agents, but not adequately field tested, failed to produce the desired results. (492, p. 242)

Demonstrations will not solve all problems. The Barpali Village Service in India, for instance, had some successes in getting farmers to adopt new practices. The Service induced the farmers to begin vegetable growing by having Service workers live in villages and themselves grow vegetables. This was successful in spite of the fact that there was no felt need to grow vegetables and that many farmers were initially skeptical about the feasibility of growing vegetables on their soil. This change was greatly facilitated by the expansion of irrigation in the area and a market for the vegetables of the early producers.

As vegetable expansion continued, however, local markets were soon glutted. Prices dropped to the point where many villagers felt it was more profitable not to grow vegetables. The Service attempted to revive a multipurpose cooperative for marketing the vegetables, again on their own initiative rather than through problem-solving, but was disappointed at the low response of the farmers and the lack of initiative of the cooperative leaders. The marketing operations of the cooperative were discontinued the next year. An attempt to procure vegetable seed cooperatively was more successful. However, even here business fell off and there was growing dissatisfaction among suppliers and customers. This cooperative depended on the support of the Service for its continued activity. (470)

When the Service attempted to introduce improved cocks and hens to upgrade local poultry, they again were attempting a project for which there was no felt need. Farmers refused to get rid of their traditional cocks or to go to the much greater effort needed to preserve and grow the improved birds. Three poultry cooperatives were started but failed. Although many new birds were introduced and there was a good initial demand for chicks and hatching eggs, the poultry program was cut back, turned over to others and eventually abandoned due to low farmer response. When the American agriculturist was replaced by someone with no interest in poultry, the program died except in two villages where Service workers kept it going. (471, pp. 30-31)

Thus, when the Service demonstrated a successful and economic practice, the farmers recognized its usefulness and adopted it. This does show the effectiveness of demonstrations and of village workers who live in the villages. All the other activities tried or demonstrated in the village failed. These other activities were undertaken in spite of the lack of village interest and without involving the village in decision making and planning.

Demonstrations will not overcome the inadequacy of a technology or institutional structure or make up for lack of farmer involvement. It is most effective as a method of technical extension, i.e., the instruction of farmers in the use and benefits of a particular technology. This does not mean that demonstrations are not a part of problem-solving extension. On the contrary, they were essential to Shell extension, Program Building and other programs. However, the demonstration works best when the people have already indicated that the crop or activity being demonstrated is one they are interested in growing or carrying out.

Generally demonstrations have worked best when done by farmers on the farmers' own land. In Gambia, demonstrations carried out by project staff were not sufficient to convince farmers. Only when two villages experimented successfully on their own land did the project catch on. These villages, in turn, were only willing to experiment because initial inputs were free, the new practice did not threaten the farmers' subsistence production and the farmers had no alternative source of cash income. (63, p. B9) A successful demonstration on a farmer's land is always more convincing than a report on experiments conducted elsewhere or a demonstration on an experiment station or conducted by staff, especially since farmers have learned to distrust results that have only been demonstrated by outsiders. (38, p. 227; 59, pp. 45-46) Because of this distrust and the difference between professional "demonstrations" and actual farmers conditions, at Puebla the term "demonstration" was avoided and "high yield planting" was used instead. These plantings were entirely the work of the farmer; the staff provided only guidance and advice. (431, p. 34)

Farmer demonstrations have not always been necessary, however. In the Barpali Village Service example, the successful demonstrations were those of the village level workers growing crops for their own use. In Nigeria, demonstration plots were cultivated by agricultural assistants as it was felt that this insured that the assistants would be available to the farmers. Farmers were encouraged to stop and talk to the assistant while he was at work. (63, p. F6) In both these cases a prolonged and consistent presence by the extension agent was required at the demonstration plot. Where less time is available at a single site, as will usually be the case, having the farmers do the demonstration would be preferable.

2. Model Farmers

Another approach to using farmers as extension agents is the use of model farmers. The best known example of this was the model farmer program at Comilla in what is now Bangladesh. At Comilla

cooperative organizers and model farmers were selected by the cooperative membership. These people were to be leading, trusted farmers of the area. There were also some youth and women organizers. Once a week they went to classes on seasonally relevant or cooperative management subjects. They were then expected to pass on what they had learned to the farmers, youth or women in their communities and carry back to their teachers questions and comments on difficulties in implementing what was taught. Especially successful organizers were made supervisors of up to four additional cooperative societies and their organizers. There were additional weekly meetings for the supervisors and they were much more involved in cooperative management than other organizers. (493, pp. 13, 27-28, 66)

The idea behind this program was that farmers will accept information from an extension worker but not advice. For advice he goes to other trusted farmers. These trusted farmers are not usually part of the formal village leadership. These propositions were developed in village research at Comilla and have been confirmed elsewhere. From this information it was concluded that the trusted farmers -- opinion leaders or natural leaders to distinguish them from traditional or other leaders -- should be used as extension agents. The idea was to get the information to the people the farmers naturally turn to for advice. (493, p. 65; 452, p. 83)

In practice, however, there were a number of difficulties with this scheme. Conflicts arose between the organizers who concentrated on cooperative management and the model farmers. As a result these two roles were consolidated as one. (494, p. 494) In most villages no more than half the farmers joined the cooperatives and the greatest benefits went to the better off farmers. At the same time, costs of the project were high, so high that it could not have been replicated province wide. (399, p. 87) Finally the model farmer concept was discontinued. (495, pp. 19-20)

With the creation of Bangladesh, model farmer training was revived. Again the cooperative primary societies elected a model farmer and a cooperative manager to receive weekly training and pass on what they learned to the members of the cooperative society. The model farmer was also supposed to conduct farm demonstrations. Again, the cooperative societies tended to be controlled by larger farmers. Training programs were poorly attended, less than 30 percent in many courses in 1974, as little new information was presented and the information presented was of little interest to the farmers. (392, pp. 73-74, 182-184)

At Daudzai in Pakistan, much the same strategy was used -- not surprising as some of the same staff were involved. The cooperative organization methods seemed to be somewhat more relaxed and informal than at Comilla. Initially people were organized to solve problems and then compulsory weekly meetings and savings programs were introduced. These organizations were made up largely of small farmers; large farmers found the rigors of weekly meetings to be excessive. Model farmers and cooperative managers were elected, were to attend training every two weeks and were expected to convey what they learned to other farmers in the weekly meetings. Managers were enlisted to organize villages around their own village. (37, pp. 10-16)

Model farming was also used by CADU in Ethiopia and again followed the Comilla pattern. In this case farmers select five candidates, one of whom was selected by the extension service to be the model farmer. One extension agent and two assistant agents supervised up to fifteen model farmers. Instead of formal training, however, extension agents advised the model farmers on agricultural practices and supplies and conducted demonstrations. (286, pp. 56-58) This pattern worked fairly well but the demands on the model farmer led to complaints that they could no longer do an adequate extension job unless they neglected their own farms.

The International Institute of Rural Reconstruction in the Philippines started a "scholar-farmer" program. Selected local leaders were trained and then were expected to pass on this information to their community. When a program to establish pre-cooperatives was begun, the program director reported that villages having experience with the "scholar-farmers" were the quickest to pick up the new knowledge and organization. (415, p. 46)

The ZAPI project areas in Cameroon also had model farmers. Here model farmers were selected by the extension service. They apparently were selected because of their ability to speak French and their previous contact with the ZAPI administration, not because of their influence on other farmers. Further, the operating assumption behind the extension was that farmer resistence to new techniques was based on psychological factors; technical and institutional obstacles were ignored, e.g., lack of equipment or water, late delivery of supplies, operational problems. The model farmers in this program were not as effective as in the other cases. (231, pp. 69-70, 75-76, 78) Concentrating training on farmer leaders in Thailand was not as effective as had been hoped either. (426, p. 25)

At Puebla an informal type of model farmer program consisted of inviting farmers, who come to town for weekly marketing days, to a lecture and discussion on a subject of current interest. Many of these farmers were farmer group representatives so there was considerable potential for ideas from the talk and especially from the discussion to spread to more farmers. This program was strictly supplementary to demonstrations and other extension activities. It was not a program in itself. (271, p. 60)

Overall, model farmer programs have had only limited success. Although they have continued to fill a role, they have not lived up to the expectations of their sponsors. There seem to be several reasons for this.

According to the Comilla theory, the model farmer should be someone trusted by the other farmers. At Comilla, however, they found there might be as many as thirteen or fourteen "opinion leaders" in a village of sixty families. There weren't just one or two people the whole village came to. (496, p. 41) Hence it may be difficult to identify anyone who would be a suitable model farmer for the whole village. This problem is aggravated by the fact that opinion leaders are not usually traditional or official leaders.

This problem may be further aggravated when, as in Cameroon, selection is on the basis of criteria such as the ability to speak French. Outsiders frequently pick the local people who are most like themselves rather than those like other farmers as a point of entry to a community. These farmers are often too young, too well educated, too wealthy and too progressive to be effective models for the average or poor farmer. (472, pp. 182-183; 231, p. 168)

In Ethiopia CADU tried to solve this problem by having the farmers elect five candidates from which one was selected as a model farmer. WADU had the farmers elect demonstrators directly. This is not, however, foolproof as agriculturally irrelevant factors may influence the election and even a well selected farmer may be trusted by only a small proportion of the community.

The idea of bringing a farmer to a training center and then having him pass on to other farmers what he has learned implies a form of technical extension. The trainers have the information and answers and the model farmer is a way of getting these answers to more farmers. (497, p. 17) To be completely successful, model farmer programs would have to be used for high value commercial crops. In fact, model farmer programs have been used as a low cost way of reaching small scale farmers usually growing food grains. Thus it isn't surprising that while, for a combination of cost and effectiveness reasons, model farmers have in some cases been preferable to professional extension, they have not been completely effective. The situation they work in requires more problem-solving and less prepared solutions.

Another factor that may have limited some model farmer programs is reliance on didactive methods. The instructors teach the model farmers; the model farmers teach other farmers. The formal classroom and written material that many farmers cannot really read are meaningless to those taking part. (231, p. 168) What is left out is practical work and experience. The most successful model farmer programs have been those that relied more heavily on demonstrations and less on training passed on by the model farmer. If this is true, then there is a real question whether there is anything to the model farmer idea. Why not just use demonstrations and why not spread them around among many farmers to increase coverage and decrease model farmer selection problems?

Model farmer programs seem to have been prone to administrative failures such as competition among model farmers and poor selection by extension services. These problems are not insolvable but may be aggravated by the other problems. Limiting access to government channels is going to increase the prestige and power of the person having such access and this increases the possibilities of conflict and abuse, especially when the community has little or no role in selecting problems or formulating solutions.

For model farmer programs to be successful they would have to go more fully in the direction of technical extension and concentrate on high value crops or in the direction of problem-solving and become

less didactic. Model farmers under the control of development committees would be a way of going the latter direction. In either case, it would be desirable to place more emphasis on demonstration and practical work and to increase the number of model farmers or demonstrators to increase coverage and prevent the model farmer from using his position for personal advantage.

3. Farmer Extension Agents

At least two programs in Mexico have used paid farmers as extension agents. At Puebla, young farmers were hired, initially as day laborers, to assist in field activities. After a period of training and selection, some outstanding farmers were hired permanently. (271, pp. 16-17) These farmers helped with demonstrations, and in the absence of the regular extension agent, conducted demonstrations, helped farmers with credit applications and otherwise carried out extension duties.

In the state of Mexico, Plan Maize was also designed to help small farmers. The state was divided into six zones and numerous subzones. These zones and subzones were headed by farmers who were selected for both their knowledge of farming and their local leadership. These plan ranchero heads at both levels, were paid a part time salary and received a transportation allowance that allowed them to reach the farmers. The plan ranchero heads were assisted by agricultural technicians (in 1974 there were 73 technicians helping 58 plan ranchero heads). (63, pp. J17-J18) Because of adequate and relatively cheap supplies of inputs, institutional familiarity and willingness to work with small farmers, and an effective government support price for maize, it was fairly easy for maize to become a cash crop even for small farmers. (63, pp. J18-J19) As a result of the plan ranchero program and this favorable institutional environment, program participants increased their output 45 percent and their real income 37 percent. The 58 plan ranchero heads plus technicians worked with 31,620 farmer-participants, one-third of the peasants in the state, at a cost of about $28 per farmer. (63, pp. J21-J23)

In Ethiopia, the WADU project recruited their lower level extension agents from the farm families of the area where the agents would be working. These agents had less formal education than extension agents at CADU or in the Minimum Package Program. Most of their training was in the field. They were, however, familiar with their community and had practical knowledge of farming. Many CADU and Minimum Package Program agents, in contrast, did not even speak the local language. So far WADU extension has been more successful than the extension of the other two projects. More farmers joined WADU than was expected and yields were greater than planned. This was in spite of the better research and more productive technical packages used by the other two projects. It is also in spite of the better funding and equipment and earlier start by CADU. (231, pp. 47-48, 78-79)

Paraguay also used para-professionals as paid extension agents. Often these men were small farmers themselves. Being only a step or two above their clients in education and experience, they proved to be good listeners and flexible in applying recommendations and policies to small farmer conditions. Each of these agents covered only 80-90 small farmers so coverage was quite intense and individualized. (63, pp. 6, 10) In Gambia para-professional extension agents were young people, usually secondary school graduates. These demonstrators were given one month of training, followed by monthly seminars on-the-job and then were assigned to work with a cooperative. One regular extension officer supervised three of these demonstrators. After the first year, the cooperatives were required to pay the salaries of the demonstrators and so far the cooperatives have done this willingly. (63, p. B16)

In Kenya, maize extension was done through paid agricultural instructors who were farmers. These men regularly visited every farm in their area. In virtually all cases they were farmers and the quality of their farming was a factor in the instructors' advancement. These farmers used their own farms for demonstrations and tried new practices there before suggesting the practices to others. Some of these instructors had up to two years of education beyond high school. Some were high school graduates and some older men had not gone this far. The instructors were supervised by college graduates some of whom had masters degrees.

The farm demonstrations which were the heart of this extension system were much like those at Puebla. The farmers, on typical farms, conducted the demonstrations and did most of the talking. The program was also supported by a highly effective system of seed production and distribution and a government procurement system. The results were a rapid growth in the use of hybrid maize and substantial increases in output.

One peculiarity of the Kenya extension system was the hybrid maize that was presented to the farmers as a new crop, not as just a different type of maize. This set the stage for explaining the entire package of practices that went with the hybrid. This was an effective strategy as, along with the new seed, farmers adopted new methods that were more effective at increasing yields than the seed itself.

The successful emphasis on the newness of the technology may seem to contradict what was said above about gradual introduction of new methods. However, this is not the case. In each farmer extension agent case, supplies and necessary services were available and were familiar to farmers, markets with agreeable prices were present and the extension services were paid to extend the particular technology. In short, these are the conditions for technical extension and technical extension does work successfully with totally new techniques. Technical extension has been made more effective in reaching small farmers by using farmers as low cost extensions of the extension system.

Even expatriate farmers have been successful extension agents. In Ghana young American and Canadian farmers, sometimes without college educations, were successful as extension agents when supported by a trained agricultural worker to provide guidance. These young farmers seemed to quickly grasp why Ghanian farmers accepted or rejected particular suggestions. Ghanian agricultural assistants were trained at agricultural stations but began by working as interpreters for the foreign farmers for two to three years to learn how to provide extension help. (63, p. C6) Thus what makes farmers successful as extension agents seems to be familiarity with farming and farm life rather than familiarity with an area or its people. This emphasizes the importance of practical farm work and farm management training for agricultural professionals discussed in the Education and Training chapter.

These farmer extension programs were all more successful than the model farmer programs. Partly this was due to the emphasis on practical work and demonstration that was characteristic of these programs. Many of these agents worked with individual farmers rather than training groups as is usually the case with model farmers. Although maize was frequently the crop grown under these programs, in each case it was grown commercially rather than for subsistence. Both inputs and markets were available and these were big factors in the success of these programs. In short, these were technical extension programs using farmers as paid agents. There have also been successful programs of non-technical extension and these have largely used volunteers.

4. Volunteers

In Senegal, a process called rural awakening (animation rurale) used farmers as problem solvers. The local director of the program became familiar with a group of villages and then explained to them the rural awakening program. The people were to select several young men, aged 25-40, to learn things for the good of the community. These men were to be respected members of the community. The director explained that he would return during the dry season to hear their decision and to pick up the men they had chosen if they chose to participate.

The men selected were taken to a center for three weeks of training in civics, local economics and discussions of possible community improvements. They visited a village other than their own, inventoried it and then discussed what could be done to improve things. On the final day of the training, the men recapitulated their experience in plays, songs, dances since most were illiterate. When they returned to their villages, they were encouraged to develop a project for the village. They received two to three more days of training on carrying out this project. After this the animaters were largely on their own and received neither pay nor further training. (238, pp. 317-319)

Rural awakening worked best in more remote areas which had the least contact with Europeans. In the peanut growing areas where European influence and commercial farming were strong, farmers

were apathetic about the program and the local leaders were most opposed. The rural awakening program was quite successful in stimulating rural awareness of interests and rural development efforts in remote areas. Many projects were successfully completed. Unfortunately, the services that could have supported this effort were slow in developing. Both the bureaucrats of the organizations which might have supported it and the local leadership in many villages opposed the program. By 1970 -- the program began in 1959 -- most rural awakening functions were controlled by production oriented agencies. The government was emphasizing technical services rather than more general social changes. Rural awakening was transformed into a cultural and educational program for youth under the Ministry of Youth and Sports. (238, pp. 321-323; 399, pp. 72-74)

Perhaps the best known use of volunteers is in health care The Chinese barefoot doctors are one example. In Niger, as discussed elsewhere, even illiterates were successfully used as medical para-professionals. At Daudzai in Pakistan, local priests were selected for first aid training and received a medicine kit and price list for work in their villages. The priests were selected because the villagers already had some faith in their healing powers. The project authorities planned to gradually upgrade the priests' medical skills and also to provide for referral to professional medical personnel of medically serious cases. (37, p. 15)

The University of Massachusetts non-formal education project in Ecuador began its program by paying its facilitators salaries. Salaries, however, caused problems. Paid facilitators wanted more money and easily became preoccupied with what they could get rather than doing the job. The costs of the program became prohibitive. As a result, salaries were eliminated for facilitators. The rewards of the facilitators were in community development and change. In addition, the lack of outside pay made the facilitators less paternalistic and more responsive and open to the community. Although not all the facilitators were successful and some quit, some not only were successful at literacy training and helping develop community development projects and cooperatives, but they also established programs in other communities and ran their own training programs for new facilitators. (391, pp. 103-105)

One of the significant differences between the use of local people in technical extension and in all types of problem-solving, including medical programs, is that technical extension has worked best with paid farmer extension agents. Paid agents, for instance, have been more successful than model farmers. In problem-solving, however, the greatest success has been achieved with volunteers whose compensation has been in the form of community development, leadership in the community and assistance from the community itself, e.g., help with his crops for Niger's barefoot doctors. The use of volunteers for problem-solving tasks has been important not only in the examples given here but also in the cases where farmers' committees have played a significant role in problem-solving. Committee members were alway volunteers.

This is not surprising, however. In technical extension the important information and objectives both come from the organization promoting the crop. Thus it is perfectly consistent for farmers to be paid for helping these organizations. The farmer looks to the organization for his guidance and his rewards. Paying farmers to be problem-solvers involves a contradiction, however, This implies the agents should look in one direction for the rewards (pay) and in another direction (to the community) for guidance on objectives and problems. In practice this hasn't worked with agents drawn from the community. Problem-solving using community members as agents has been most successful where the agents have had to turn to the community for both guidance and rewards. People respond to those who "pay" them regardless of what form the pay must take. Thus if agents must respond to the people and their problems, then it is the people who must control the rewards.

There appears to be an exception to this rule in the above cases: the Shell projects. Here the professional extension agent works directly with farmers and is expected to carefully tailor his advice to local needs and what people want. Here the rewards are controlled by an outside agency and yet the agent responds to the peoples' problems. This seems to be due to two factors: (a) the outside agency provides time to discover the farmers' problems and rewards for doing so; and (b) agents are rewarded for success and the way to succeed in dealing with small farmers is to use a problem-solving approach. Thus, the Shell programs, and certain others, are not an exception to the principle that people look to those who provide the rewards for guidance on what to do. Shell extension agents problem-solve because that is what works and what they are paid to do.

The fact that community problem-solvers must be rewarded by or through the community does not mean they need no support from outside. In Niger, one third of the health workers trained gave up health work by the end of the first year. They complained they got no help from their village and, even more important, the dispensary nurse had not visited them. The 80 health workers still at work were receiving regular visits, an average of one visit a month, from a nurse. (423, p. 12) Follow-up visits by health service and community development agents were also found to be essential in a midwife program in the same part of Niger. This was especially important where new, younger midwives were being gradually substituted for older midwives. (423, p. 17)

In the nonformal education project sponsored by the University of Massachusetts in Ecuador, the weakest community programs were those seldom visited by the staff. To overcome this problem the facilitators organized their own follow-up meetings. They felt it was important to discuss and exchange ideas with someone from outside. Their meetings included the facilitators from other areas as well as staff. (391, pp. 102-103, 119-120) In several cases facilitators expressed thanks for being able to talk to outsiders about their planning. When no one outside seemed interested, their own activities weakened. (391, p. 130)

The importance of this type of follow-up discussion-of-problems-with-outsiders also shows up in the frequency with which visits to other projects, seminars, and other short meetings with other people in similar jobs is used as a form of refresher training. See the Training chapter for a discussion of this type of follow-up training.

5. Summary

The use of local people to carry out various types of extension task has proven effective in many types of circumstances. Paid farmer extension agents have worked most effectively in technical extension.. Unpaid, at least by any outside agency, volunteers have worked best in problem-solving extension and in service functions such as barefoot doctor programs where responsiveness to the community and its members is an important consideration. In either case demonstration programs have been more effective at introducing new practices than more didactive methods such as model farmer programs.

The success of these farmer-leader programs is not as surprising as it may seem. It has been found that communication is most effective when the sender of a message and the receiver are similar; the greater the similarity the more effective the communication. (472, pp. 181-182) Thus it is not surprising that other farmers are more effective at communicating with farmers than extension agents are. This point must be kept in mind in selecting model farmers and farmer extension agents as many programs have failed when the farmers selected were those most like the extension agent but least like other farmers.

F. Farmer Organization

In the discussions above on other aspects of extension, a number of types of farmer organization and how to form them were discussed. One of the methods discussed was Program Building which was perhaps the most elaborate use of the development committee approach. In the former East Pakistan, development committees were part of the political structure of the province. The committees, made up of leading farmers and officials of the villages, surveyed their areas to discover what the local problems were, worked with the relevant government departments and had a formal system of reports and regular meetings. Committees were organized at several levels from village to district; subcommittees were established at each level for dealing with the specific problems which had been identified. The subcommittees prepared area plans which were reconciled and consolidated and approved by the Union Council, the local political body. (429, pp. 71-73; 281, pp. 17, 65) These subcommittees sponsored 210,000 crop cutting demonstrations over a five year period and sponsored adult health, recreation and other economic and social development activities. (429, pp. 35-36; 76, pp. 256-259) Plans of surprising complexity were developed and implemented. (244, pp. 62-63)

Ghana had Village Development Committees. These were largely based on self-help and were fostered as community development activities. These committees received some planning and material assistance but little emphasis by the government and so far have not been very significant although there are exceptions. (198, p. 34; 63, pp. C34-C35) Work on village development committees in Nigeria and Ghana has shown, however, that with a minimum of technical assistance, people can plan and implement many types of local development projects. They can develop the skills necessary to define priorities, estimate resources and fit their activities into larger scale plans. They are also ready to commit their own resources to projects. (506, p. 32)

In Malawi the Lilongwe Land Development Program used two different approaches to extension and farmer organization. In areas of higher potential, extension services not only promoted new technologies of various types, they also promoted a system of development committees. A major function of these committees was to provide feedback to the extension services on agricultural services and needs but they were also to provide the farmers with a way of becoming involved in other types of problems such as health, education and community development.

These committees were organized hierarchically. The Village Planning Committee was made up of local officials, elected members and representatives of church, farmer's and women's groups and sometimes included a member of the Malawi Congress Party. Above the village was the Section Planning Committee covering an average of 10-12 villages. This was made up of the elected officials and headmen from each of the villages planning committees and other local authorities. This committee elected its own officials who then become representatives to the next higher level and so on up through the Unit, and the Group to the Program Advisory Committee. Here the senior officers for the Project and the area are on the committee with the representatives from below.

In what were called the modified-input areas (MIAs), generally areas of lower potential, special efforts were made to separate the organization of development committees from the activities of regular extension. Instead of a preconceived model, no standard pattern of activities was introduced. The people were to determine for themselves what activities were to be undertaken. Extension personnel had less training and had twice as many people to reach in the MIAs. Their primary job was to determine what the people wanted rather than to extend techniques as in the areas where technical extension operated. To prevent the standard pattern of development from working its way in, the MIAs were staffed primarily with new agents.

Although these committees had limited real power, they did serve as a liaison with officials at all levels. Further they were a valuable training device in orienting the rural population towards problem-solving and improving conditions. In 1972-73, over 10,000 people, representing 37,000 farm families were involved in decision making activities as part of the committee system.

In Niger, such local committees carried out small-scale developmental activities such as distribution of fungicides, tree planting and road resurfacing. These organizations had a similar educative effect. They also reduced the people's fear of the government by putting them into a beneficial relation to the government and by reducing abuses by government officials. (465, pp. 2-3)

Farmer organizations may also be a means of extension, a way of helping the extension agent cover more farms or do his job better. The Demonstration Area Project in Uruguay relied heavily on farmer groups to make extension successful among small, reportedly backward, farmers. This project began with four years of work forming and working with youth and housekeeping clubs. These clubs not only succeeded in many of their activities but also interested older, more conservative farmers. Several poultry projects succeeded and required that young people work with their parents on the projects. The success of various home economics projects often made housewives the most enthusiastic supporters of the program.

In the second stage, from 1956-1962, the Project put most of its emphasis on working with farmers largely through farmers' committees. Much larger scale poultry projects were introduced so that by 1961 one hundred forty-three farmers had henhouses with more than 500 hens. Another 282 farmers had less than 500 hens each. Truck crop, hog and tomato projects were successful and a milk production pilot project started. Many social and health projects concerning housing and sanitation were also successful. In all of this the farmers' committees played a key role in studying and planning the projects. These committees visited farmers in other areas to get information, planned and carried out the projects, and selected the farmers who did experimental or pilot projects. Further, these activities and the benefits from them continued after the project activities themselves stopped. (507)

Extension through groups was a fundamental part of the successful agricultural development of Japan, Taiwan, the Republic of Korea, and Israel and has worked on a smaller scale elsewhere. (360, p. 47; 75, p. 19; 47, pp. 167-168)

Scattering too few extension agents over large areas to deal with individual farmers has not been successful. (235, p. 178; 196, p. 14; 408, p. 3) Having agents deal with groups of farmers is an obvious way to economize on staff costs or to spread the small number of agents, or of good agents, over more farmers. (75, p. 18; 316, p. IV-23; 234, p. 28) In addition, farmers' organizations can take on many extension and other developmental responsibilities, including at least part of the financing of the extension system. (235, p. 178; 474, p. 9) One technique used in the Philippines, Yugoslavia, Australia and elsewhere, for both financing and developing farmer commitment, is to have villages bid for the services of extension agents. (508, pp. 48-49)

Another frequent purpose of farmer committees is to obtain information from the farmers about the operation of programs. The Vihiga Special Rural Development Program in Kenya, for instance, found that group meetings with farmers were of little or no use when officials just talked to the farmers. Exhortations and threats concerning loan repayment tended to discourage rather than encourage farmers. (509, Attach. 1, p. 1) When these meetings were changed to encourage the farmers to discuss the program and explain their problems, interest increased. Farmers became eager to meet and a number of specific ideas for improving the credit program emerged. These were important because the program was not too successful to that point. (509, Attach. 1, p. 1; 63, p. D7)

Tea growers' committees in Kenya were organized at divisional, district and province levels. The committee members were largely chosen by the growers but the committees also included agricultural officers and tea company officials as ex officio members. This hierarchy of committees not only provided a channel for extension and policy information to be conveyed to the farmers but also gave the farmers a way of conveying their concerns to the relevant officials. (231, p. 73) Such committees also worked in Nigeria. (417, pp. 189-190)

The Cotia cooperative in Brazil became so successful in its early years that it spread over several states. In the process it lost direct contact with its members and problems arose because of the Cooperative's limited ability to identify and respond to the increasing range of member needs in its widely scattered activities. To overcome these problems, informal committees representing groups of producers in particular areas were set up for each of twelve major product lines handled by the cooperative.1/ As the cooperative grew even more and the number of Local Groups of Producers increased, it became necessary to establish twelve central committees at headquarters to work with the various local groups and advise the general board of directors on member needs. At the same time certain executive powers were turned over to the local groups. For instance, local potato growing groups had to analyze their processing needs and plan, finance, buy, install and operate their own processing facilities. The local groups became more like cooperatives themselves. (454, pp. 4-6)

Cooperatives are another form of farmer organization. The Comilla experiment in what is now Bangladesh is often cited as an example of a cooperative system that was successful. It had two tiers, a village level cooperative which was the planning and training unit for new practices, and a federation at the thana

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1/ The product lines were potatoes, poultry and eggs, fruits and vegetables, coffee, cotton, rice and cereals, peanuts, tea, bananas, alfalfa, ramie and vegetable oils.

(county) level for credit and other supervision. By-laws and other checks and safeguards, e.g., frequent open meetings, insistence that managers be local people, were built-in and imposed by the outside control of the sponsor, the Academy for Rural Development. Extensive training was required before the villagers could operate this system themselves. (50, pp. 11-14; 43, pp. 158-159) Even then credit was externally supervised. (275, p. 687) Although cooperative development was successful in the area directly supervised by the Academy, the results were mixed for surrounding areas where supervision was less intense. (279) In most villages, no more than half the farmers joined. (399, p. 87) In addition, the supervision costs were very high. It has been estimated that it would take over 40 years at twice the effort programmed for the universities to staff all of Bangladesh like Comilla. In practice government organized cooperatives have rarely worked without government support. (234, p. 20)

Governments have successfully sponsored and developed cooperatives coupled with marketing institutions such as marketing boards for many cash crops in different countries. (268, p. 118) In Tanzania, such cooperatives were created for cotton, in Kenya, for tea. Marketing cooperatives created by and closely linked to the national government were a basis for Israeli agricultural development. (40, p. 504) Such cooperatives worked best for high value cash crops which generated the income necessary to cover institutional and management costs. (234, pp. 20-22)

Where marketing and processing cooperatives have had to compete with established commercial traders they have often failed. In Maharashtra, India, for instance, 73 cooperative cotton seed oil mills were established but 54 closed down and the remainder operated only with heavy government subsidies. Even cooperative members preferred to sell for higher prices to private traders. (456, p. 1755) Thus monopolies on procurement are frequently granted to marketing cooperatives systems. (174, p. 60; 234, p. 22)

Joint farming is a more controversial type of farmer grouping. Where land reform has turned large estates over to farmers, governments have sometimes tried to preserve the organization of the estate and operate it as a cooperative or a corporation. Ejidos in Mexico were formed this way. (204, p. 25) Small scale farms surrounding former estates in Tunisia and Peru were included in land reform programs that preserved or even increased the size of the estates. (97, p. 292) In Iran, joint operation of estates were more corporate than cooperative. Corporate farming of land was also growing in Japan. (97, p. 290)

In Taiwan blocks of a minimum of 750 acres were formed by voluntary land consolidation. This allowed the removal of bunds and improved management resulting in 10-25 percent increases in production on consolidated farms. Smaller projects averaging 40 acres of rice land also developed. (212, p. 115; 203, pp. 38-39) Consolidated farm blocks were also formed in Thailand. (203, p. 39) Some moshavim, in addition to the kibbutzim, in Israel were jointly farmed. (97, p. 291)

Farming village land in blocks improved efficiency, e.g., as in water management and use of pesticides, in Egypt and Malaysia. (213, p. A141; 203, p. 38) Sometimes only certain operations, like mechanized plowing, are done jointly. (268, p. 118)

Joint farming need not be on a large scale. A group of farmers in Ghana formed a cooperative and as a part of it, farmed three acres communally and kept a communal hog production operation. The majority of their land they farmed individually. (63, p. C28) In Taiwan and Thailand informal farmers' associations or clubs have partially taken over functions previously handled by cooperatives. Small mutual aid groups have organized common use of machinery or jointly do field work. (97, p. 289)

Cooperative organization has encountered many difficulties. Government-aided collective and joint farming societies in Maharashtra, India have largely closed down or are in liquidation. (456) In Pakistan, the most powerful men in the villages took over cooperatives and then loaned the cooperative's money to the members at high rates.1/ In Ghana, non-existent cooperatives were registered in order to fraudulently obtain government funds. (198, p. 100)

Although generally government sponsored and organized cooperatives failed in India, there were successful cooperatives. Some milk, sugar, oilseed and cotton-marketing cooperatives were successful. These successes had good, non-governmental leadership and administration and offered services, such as processing, to help cover costs. (49, p. 67)

Thus farmer organization has been a feature of successful agricultural and rural development almost everywhere in the developing world. As with extension, two basic approaches have been used in forming these organizations even though the purposes of the organizations have been quite varied. There are problem-solving approaches that create organizations that reflect particular needs. There are also formal organization approaches in which an outside authority, usually the government, introduces a particular type of organization for specific functions such as promoting a high value crop. Although there are successful examples of both approaches, there have been many failures in organizing farmers.

1/ "In effect the government was supplying new money to the established money lenders so that they could continue to exploit their customers, when the goal of the program, from the administrators' point of view, was to circumvent money lenders and provide cheap credit to farmers." (275, pp. 681-682)

1. Formal vs. Problem-Solving Organizations

When farmer organizations, cooperatives, associations or local government councils are created by the government, they are often designed as finished products with a wide range of functions and responsibilities. In Egypt, for instance, village councils had responsibilities in education, health. public utilities, social activities, rural economic development, labor, agricultural cooperatives, food supply, communications, and security. But the councils had neither the trained personnel nor the financial resources to attend to all these areas. Finding themselves unable to handle these responsibilities, the councils became demoralized and sank to their traditional cynicism and sense of helplessness. The government had given the councils responsibilities but did not trust the councils enough to give them the resources to carry out those responsibilities. Nor did the councils have time to develop experience and training on a limited number of tasks before the full range of activities was forced onto them. (400, pp. 101-108)

In Tanzania the government forced the development of multipurpose cooperatives by compelling cooperatives to take on roles they were unprepared for. Financial responsibility for the outcome of such developments was left with the cooperatives. Collectivization of tobacco farming raised costs and made management much more complex. Cooperative management, however, was often inadequate and even corrupt. Membership interest weakened when the monopoly powers granted the cooperatives forced them to treat members and non-members alike. The rapid pace of cooperative development and lack of management experience led to centralization of many decisions. This discouraged member participation, interest and responsibility.

In Tunisia, cooperative farms were forced to take on various political, social and welfare responsibilities, such as the employment of surplus labor, that they could not fulfill. The program was accelerated several times without planning or preparation. Officials often patronized the membership and failed to use the members' knowledge and experience. These problems were aggravated by a shortage of competent cooperative farm directors and overcentralization which caused delays and inefficiencies and prevented the farm directors from getting the experience they usually lacked. These farms were very complex and were seven times larger (1000 hectares) than the average non-cooperative large scale farm; there was no previous Tunisian experience with this size operation or type of organization. There was only one agricultural engineer for every twenty farms.

Many governments have tried to force farmers to adopt particular types of organization. Tobacco output dropped and the Tanzanian government met considerable resistance when they tried to move smallholder tobacco growers into ujamaa villages and collectivize tobacco production. Administrators were forced to relax

collectivization objectives and reduce the rate at which collectivization was introduced. (231, p. 138) One of the biggest difficulties of the large scale of Tunisia cooperative farms was that participation was not voluntary. The result was a lack of cooperation and resistance by small farmers that led to their being allowed to withdraw from the cooperatives.

In trying to develop widespread cooperative production, Tanzania attempted to jump well beyond its own experience in cooperative work. In fact, it went beyond the experience of most countries. This was not necessarily wrong. If the government attempted to make up for this lack of experience by a careful study of the experience of China, for instance, and had moved carefully through a series of steps, things might have worked out well. Instead the lessons of China, where joint production was and still is being approached very gradually, were ignored. There was a plunge into an ujamaa movement, often accelerated by zealous local officials, that created more problems than it solved. Later it was suggested that ujamaa is achieved in three stages: formation of a village, settlement and construction of the village, and cooperative production. (510, pp. 74-75) In spite of this phasing there is still a big lag between stages two and three, i.e., between the stages that can be promoted with government resources and the stage that requires learning new methods and ways of working together. Where cooperatives do have large memberships and are enthusiastic, this has generally been where they developed gradually in response to local initiatives.

A Shell project in Nigeria successfully developed cooperative groups by starting with a single productivity activity. When this was successful, the group was encouraged to formalize its structure to obtain credit and make contracts. These groups were small and closely knit. A union of primary societies was also formed initially for a single productive purpose -- to buy a rice mill. After organizations are established and successful at one activity they were encouraged to take on new activities. One union, for instance, is a commercial distributor of cement, fertilizer and a pesticide. It distributes credit and livestock to members. (63, p. F53)

At Puebla in Mexico, credit societies discovered that their organization was useful for other purposes. Some groups formed community irrigation projects and borrowed larger sums of money to drill wells and buy pumps. Other groups expanded borrowing to start livestock or truck farming. Some of the groups went into the transportation business moving supplies for other credit societies. (511, p. 7)

The progressive development of traditional institutions and methods with minor government support has been successful on some Pacific Islands and in Sumatra. (234, p. 14) In New Guinea, traditional systems of organization, including a matrilineal land ownership system, were flexible enough to adapt to the new technology of cocoa growing, fermenting and drying; in fact, these

activities were threatened, not by the inability of the farmers to understand the economics and management of the process, something they understood well enough, but by the inability of the Australian administration to understand the economics of small scale processing and marketing. (467, pp. 335-337, 262)

Problem-solving methods of developing organizations avoid the problems of formal cooperatives by letting the community select the problems to be dealt with. Program Building was a good example. The community decided both what problems and how many problems to deal with. Although there are records of communities that took on projects that the government was unable to complete, e.g., communities may build schools the government is unable to staff, it is rare for communities to try to do things beyond their own capacity.

Furthermore, it is not complexity as such that defeats farmer organization. The examples of the many activities of the Cotia Cooperative in Brazil and the Farmers' Associations in Taiwan show that complexity is not the problem. The problem is that complexity is introduced before the people are prepared to control it and before trusted management has developed that is capable of managing it.

2. Developing Local Leadership

One of the differences between methods of organization and problem-solving like Program Building and technical extension types of organization directed from above is in the amount and kinds of leadership needed. The elaboration of subcommittees in Program Building multiplies public leadership positions several times. New leaders are given a chance to develop and emerge. This does not necessarily mean old leaders will be replaced but it does mean old leaders will have to change their methods if they are to maintain their positions. In Egypt, for instance, one observer noted that one of the most impressive things he saw was a former day laborer, now head of the local cooperative governing committee, speaking in opposition to a leading landowner in a village council meeting. This leader had lost the cynicism and dependence common to most small farmers. He was emerging as a self-confident new leader. (400, pp. 113-114) At Puebla, farmers groups that got to be very large were urged to subdivide into smaller groups. This simplified administration and allowed more farmers to hold leadership positions. (271, p. 51) Extension agents made sure that the leaders of the farmer groups were always the ones to make arrangements for credit and fertilizer so responsibility stayed with the farmers and their leaders. (271, p. 13)

At Puebla some credit groups had difficulties because the leaders selected did not work out. Many leaders took no initiative in getting techinical assistance or in other activities for their groups and three of thirty-five leaders didn't even repay their loans on time. The members of these groups admitted that they made

mistakes but said it was difficult to select good leaders. The three late repayers had previously had good reputations in the community and had been active in promoting the credit groups. From this it was concluded that it was best to start with a simple organizational form, such as the credit group, when starting out and when farmers are still distrustful. (271, pp. 60-61)

This is sound advice as far as it goes, and is consistent with the need for gradual development, but it leaves the community with little help in solving their leadership problem. Although some credit groups have gone on to undertake other activities in transportation, irrigation, truck farming and livestock production, none of these groups have evolved into organizations to deal with larger groups or whole community problems. (511, p. 7; 459, p. 349)

The Village Committee system such as Program Building solves both problems. As discussed elsewhere, it does allow, even encourages, looking at and working on whole community problems. Even more important from a leadership development point of view, the community gets to observe a large number of potential leaders in action on issues that are relatively risk free. No money is involved initially but work is. People get a chance to see who really is reliable as a leader. In the former East Pakistan this led to considerable turnover of local elected officials. A study of the 1964 elections found that sixty percent of the Union Council Chairmen were elected to the Council for the first time in areas where Program Building activities were significant. (512, p. 42)

Leadership in created-from-the-top-down organizations is quite different. First, there are usually very few such leaders. Often single individuals take, or are given by the sponsoring agency, the leadership role. At Comilla the Academy for Rural Development had groups select a model farmer and a cooperative organizer. But conflicts between these two led to the two roles being consolidated as one.

Since government sponsored organizations are formal and complex, the leadership requires considerable training, often outside the community. But the combination of outside selection and outside training decreases the leader's role and trust among community members. (See the Training chapter.)

The failures of farmer organizations often lead civil service and extension personnel to assume more of the responsibility for cooperative and village level activities. In Niger, "unhappy experience strengthened the U.N.C.C. (Niger Union of Credit and Cooperation) in their belief that they were indispensible at all levels, and that the illiterate peasants would be incapable of taking over their cooperatives for at least 25 years." (465, p. 2) As a result, farmers regard the activities as even more alien and become more passive or antagonistic. (465, p. 7) Strong, honest and effective local leadership does not develop. (465, pp. 1-2) Cooperatives tend to become mere conduits for credit and inputs supplied by the government. The members don't take any initiative. (61, pp. 76-80)

Thus, one of the advantages of problem-solving methods of organization, especially when trained and experienced managers are scarce, is the development of local leadership. The alternatives to such leadership development have been high cost training and the failure and demoralization that have gone with poor management and over centralization.

3. Forming Cooperatives

When farmers join together in planning committees and develop projects, publicly financed or on a self-help basis, they are investing time and the effort they feel they can spare. For instance, left to themselves, farmers plan to undertake self-help projects only when labor is not tied up elsewhere, a precaution governments often ignore. In addition, cash contributions are usually fairly minor and can be withheld if other members fail to contribute. As trust increases, contributions come more easily.

Cooperatives, however, involve a new level of commitment and trust. Some cooperatives have requirements for paid-in shares. Others have savings plans, sometimes compulsory ones. Often there is joint responsibility of the members for defaulters' debts. Farmer money or output may be in the hands of other farmers, the government or managers for varying periods. The cooperative organization costs money to run. Operations, such as marketing on a large scale, may not be easy for an illiterate farmer to understand. Even under the best of conditions a cooperative may take a loss due to market conditions beyond its control. Hence, cooperatives demand a degree of mutual trust that is often lacking in peasant communities.

Thus before the move to cooperatives is taken, care should be taken to see that the groundwork has been laid. There should be successful previous experience with group organization and activities. If the cooperative will require farmer investment, then previous economic development activity may be necessary to provide the farmers with the necessary cash or at least the successful experience of increasing their incomes through individual and joint efforts, e.g., joint purchasing of inputs or operation of equipment like sprayers. Trusted management is especially important; so is local development of managers.1/

1/ An International Seminar at the University of Reading on Change in Agriculture reported that there was considerable support for smaller, need-oriented farmer groupings (e.g., to run a tubewell or finance local storage). These smaller and less formal groupings, where they succeed, can develop into cooperatives as their experience and self-confidence increase. (234, p. 16)

Some cooperative preconditions may lie outside the villages. At Comilla, rural public works and irrigation programs were essential complements of the cooperative program because cooperatives as such could not compensate for the high costs, low output, and periodic floods which were due to the lack of roads, irrigation and flood control. In these conditions, even well-managed cooperatives could not prosper. (279, p. 5) The ability to provide the training necessary for cooperative operation should also be considered as training is often a key to successful cooperative operation and management. (97, pp. 67-68; 281, p. 25; 490, p. 7; 198, p. 59)

However, it is equally important that these considerations not stand in the way of cooperative formation. They are problems to be considered and overcome, not justifications for doing nothing. The development of the commune system in China was premature at almost every step based on the above considerations and yet it succeeded because of the commitment of the leaders and the willingness to experiment and to correct errors. (239, p. 26) In Niger, where there was considerable group planning and group work experience to build on, lack of literacy was overcome and group marketing cooperatives were successfully formed by simplifying management procedures. Accounting systems were developed which were simple enough for illiterates to use. Cooperative officials were elected; sometimes they were not re-elected when the farmers were unhappy with their previous performance. This system was quite sufficient for village marketing activities although higher level marketing functions were in professional hands and broadscale literacy training was considered a prerequisite to full farmer management of the cooperatives. (465, pp. 4-9)

4. Size and Federation

Frequently when organizations are created by outside agencies, the primary group (smallest formal group in a hierarchy of groups) is large. In practice, however, the most successful organizations have often had small primary groups. The basic work unit in China, for instance, the work team, has twenty-five to thirty families. (82, p. 3) In Tanzania, observers found that the larger the size of the *ujamaa* village, the less the cohesion, sense of community and responsibility of the members. Many of the successful villages had from as few as thirty to one hundred members.

Technical assistance agents at Puebla in Mexico recommended that credit groups with more than twenty members be subdivided into groups of about ten members to facilitate administration, internal communication, and contact with extension agents. (271, p. 57) Some of the most successful credit groups were solidarity groups of from three to nine members. (271, pp. 56-57) Plan Maize, also in Mexico, formed credit groups usually of three to nine members. (63, p. J18) In Nigeria great progress was made in developing cooperative groups when the groups were small and closely knit. (63, p. F53)

When the primary group is small, it is too small for many activities. At Puebla, for instance, although the credit groups did become a model for setting up irrigation, transportation and other groups, it was found that they were not an adequate foundation for tackling many community wide problems.

Successful cooperative, farmers' association and village council systems have almost always provided for federation of some sort beyond the primary group. The Cotia Cooperative in Brazil has branches, regional groups and a Federation. They found this was insufficient to maintain communications with members so local groups were formed and as the cooperative grew these also soon had two levels, local and at headquarters. (454, pp. 3-7, 45, 46)

The Farmers' Associations of Japan and Taiwan are federated up to the national level. China has a system that federates from the work teams to the national level. Uganda and Ghana have cooperatives federated to the national level. (61, pp. 82-85; 198, p. 59) Cooperative systems in Kenya, Israel and elsewhere federate up to marketing boards or other processing organizations. Such cooperatives are often organized by commodity and frequently are little more than collection mechanisms for farm output. The committee system used in Program Building had a form of federation up to the provincial level, i.e., from Union, to Thana, to District, to Province.

How fast farmer organizations can be federated depends on the purposes of the organization. The Farmers' Association system in Taiwan came about through several steps of consolidation and federation. Smaller and more specialized groups, sometimes voluntarily, sometimes by law, were gradually, over generations, put together into the system that exists today. (367, pp. 38-40) These groups had fairly complex functions and the Farmers' Association manages most aspects of agricultural development from research to processing and marketing. In Thailand, in contrast, farm improvement clubs, groups of farmers that got together to discuss their farm management problems, grew in less than three years from a first club to a national congress of clubs. (508, p. 62) These clubs, however, had very simple activities compared to the Farmers' Associations. Because of their complexity and the wide range of skills required, multi-purpose cooperatives and associations have required considerable time to develop the necessary skills and experience. Although the advantages of such multi-purpose organizations are frequently cited, successful ones are rare. (2, p. 10)

5. Equity in Farmer Organization

One of the difficulties that organizers of farmer groups have continually encountered is that of equity. For whatever reasons, it always seems that some farmers are included while others never join. The presumption is that it is the poorer farmers that are left out. For instance, a controversy arose over the emphasis on

farmer organizations at Puebla. Project staff felt the groups were essential to provide access to credit for small farmers and ejidatarios and as a beginning for more complex forms of organization. Critics charged that the groups were elitist organizations which denied access to credit and other Project services to the broad majority of villagers. This would imply that the group members were better off than the rest of the farmers. (459, p. 273) A field survey to determine what the situation was indicated that the groups were not elitist and were open to new members and new groups. Non-members did not attribute selfish motives to the members and most non-members said they had been invited to join but still hesitated because of institutional problems. The fact remained, however, that many farmers still had not joined the groups and the groups that existed were not an effective means of solving many types of farmer problems. (459, pp. 348-349)

The same difficulties have been encountered in many other farmer organization efforts and there the exclusion of small farmers has been clearer. Comilla was unable to get more than half the farmers in a community to join their cooperatives and often much less. Less than half the communities had cooperatives even after many years of work and demonstrations and many of these cooperatives were dominated by larger farmers. (279, pp. 17-20) This low rate of participation was justified on the grounds that the Comilla cooperative approach was a hard, demanding program that required both self discipline and self sacrifice from the farmers. (279, p. 20)

CADU and the Minimum Package Program (MPP) in Ethiopia tried to solve the problem of large farmer dominance by excluding farmers with over twenty hectares from credit programs. Although this did a great deal to tilt benefits towards small farmers, many small farmers were still left out. Tenants particularly failed to benefit. Only five percent of the MPP credit recipients were tenants in 1973 even though from one-third to two-thirds of the farmers were tenants. (469, pp. 54-55; 231, pp. 178-179)

More universal membership in groups has been achieved in basically two ways. First, either the cooperatives or their services were opened to everyone by law. Membership in Japan's Farmers' Associations was made compulsory for all farmers in 1905. (47, pp. 167-168) This, however, was after about thirty years of experience with voluntary, and generally successful, farmer group activity of various sorts. Membership in Farmers' Associations is also compulsory in Taiwan.

In some countries, although membership is not compulsory, services must be made available to all farmers. In Tanzania the monopoly powers granted some primary cooperative societies required that they treat members and non-members alike. This reduced membership interest as there were few advantages and higher costs in joining a cooperative. Providing services to non-members is not always harmful, e.g., at Comilla such services helped cover overhead costs. (275, p. 679) However, care must be taken to see that this openness is not destructive of the cooperative organization and membership participation and control.

Perhaps the easiest solution to the membership problem was found by Program Building and in some similar programs. By starting with a quasi governmental organization -- the committees created were adjuncts to the Union Council -- the whole community was automatically a member of the organization even though only certain people served on committees. There was no requirement that people join anything. Each person could participate as much as he wanted and the benefits of committee activities were available to everyone. This did not solve all problems; credit, for instance, still required private organizations such as cooperatives or solidarity groups. But it did avoid the problem at Puebla where technical assistance as well as credit was channeled through and limited to the farmer groups. In Program Building technical assistance was organized by a public committee of and for the whole community.

6. Farmer Organization and Community Development

For many people, the problem-solving method of organization recommended here will suggest community development. Since there are some significant differences between the approaches, it may be useful to set out how community development and problem-solving differ.

The major difference between the two approaches is in objectives. The objectives of problem-solving arise out of the problems of the community. This is true not only of technical assistance but also of organization. The problem-solving approach to organization is to first have the community pick the problem. If the community or a group agrees that organization is part of the solution, then organize to the extent necessary to solve the problem. Out of the experience of successful organization more permanent organizations will grow.

One of the primary purposes of Indian community development, and of Indian cooperatives, "was to develop a sense of community, of something larger than family and caste, and a sense of participation in the social and political process." (49, p. 75) It was also to "prepare farmers' minds for change, to build a concept of social cohesion." "The basic design...was intended to change the attitudes and outlook of the rural people," and to touch every aspect of rural life. (49, p. 35)

Over twenty objectives were suggested for community development in Latin America. These objectives covered all aspects of community life at a high level of abstraction: "mobilization of the population for the objectives of development," "strengthening the personality of the community," "attitude changes," "raising income levels." (394, pp. 232-233) In Venezuela many of the objectives were explicitly listed as intangible and the chief objective was "to attain the integration of the individual into the society and to incorporate him into the process of modernization required by economic and social development." (394, pp. 129-130)

These, however, are the objectives and concerns of the change agents or agency, not of the farmers. The abstractness of these objectives is in sharp contrast to the specificity of farmers' problems. The long lists of problems to be dealt with are also very abstract compared to the specificity of a particular individual's or community's problems.

Community development emphasizes the importance of community organization. Many community development programs have been organized in ways similar to problem-solving approaches such as Program Building. Hierarchies of committees and subcommittees have been used in Venezuela and Ethiopia, for instance, and in Leribe, Lesotho. (See Extension Chapter, first section.) (506, p. 45) These committees, however, were not successful except in the activities in the Leribe project that the farmers actually helped plan. (63, pp. E20-E22)

Community development in Venezuela was to be "a great integrating program, based essentially on the coordination of all national, state and local programs designed to promote the welfare of the community." (394, p. 124) Although popular participation was to be insured by a system of local committees, the major function of these committees was to help with program integration. Community development organization in India was similar in form and purpose -- the integration of local, state and national plans and programs. (506, p. 44; 49, pp. 75-76)

Unfortunately integration of programs does no good if objectives are wrong. In practice, objectives were wrong because people had no real control over what was to be done. For instance, one of the few community development programs that is cited as successful, the Barpali Village Service program described above, consistently undertook activities without finding out whether these were what the people wanted. In some cases, as in initial vegetable growing activities, this was successful because the activities happened to be ones that the community felt a need for. In many cases, as in establishing cooperatives and an improved poultry program, activities were started in spite of a lack of farmer concern for these issues and these activities failed. Nor were officials in the Indian Community Development Program encouraged, in practice, to identify local needs and wants. Instead, orders were passed down from above. (49, pp. 38, 40)

Although objectives are selected outside the community and organization is for the integration of programs rather than the solution of the community's problems, the people are still expected to provide the manpower and organizational effort as self-help. The issue of self-help led to considerable debate in the Peace Corps. The question was whether significant community development was possible without outside resources. Some even argued that the provision of outside material assistance prevented the development of self-reliance and democratic participation. (394, pp. 220-221) Many community development workers have had an anti-government bias and have urged total self-reliance. Indian

community development, for instance, lost contact with agricultural research and extension and hence with the limited technical assistance that was available. (49, p. 38)

Problem-solving approaches are much more pragmatic. Because the community sets the objectives, self-help efforts are much more likely to be forthcoming. At the same time, since the objective is to solve a particular problem, the question of whether outside resources are desirable depends on whether they are available. If the community wants a road and can get the government to build it, they have the road and can go on to other problems just as surely as if they built the road themselves. The important point is not total self-reliance but success that leads to further successes. Self-reliance is important but not using available outside resources reduces the chance of success.

In practice community development has not been very successful. (286, p. 42; 26, p. 34) Two of the biggest, and perhaps most idealistic, community development programs, in India and Pakistan, were both dropped as failures. Although many projects and activities were carried out, the programs did not significantly alter the basic conditions of rural life. Especially, they had little impact on agricultural production. (399, pp. 41, 70-71) Although this failure was partly due to the lack of an adequate institutional structure, community development had cut itself off from the type of farmer information and organization that might have led to revised policies and new farmer-led institutions.

One of the most successful national community development programs is the one in Bolivia. National Community Development Service (NCDS) personnel are welcomed by the people almost everywhere in the country although other government officials are not. (63, p. G24) Communities are willing to put up an obligatory cash contribution to get an NCDS project started and are often willing to follow up with another NCDS project, and another. (63, pp. G24, G30-G32) But the NCDS operates differently from other community development programs Its field personnel are farmer-paratechnicians, originally paid and more recently volunteers. The NCDS trains over one thousand men and women a year for this purpose. (63, p. G33) Many of these paratechnicians were drawn from among the traditional village leadership, chiefly from peasant syndicate leadership, and often return to their leadership posts. Syndicates are virtually universal in Bolivia though some are only partly active. Leaders are popularly elected by the syndicate membership which includes all families in the community. These syndicates are responsible for virtually every community activity and operate through committees for things like: schools, water, agriculture, livestock, markets, fiestas, propaganda, etc. (63, pp. G26-G27)

Perhaps the critical difference, however, is that the NCDS does not provide material or technical assistance until after the community has decided what it wants and has put up a cash contribution to help fund the local project. Far from discouraging activities this requirement seems to have stimulated it and the

NCDS gets more requests for help than it can handle. NCDS staff have been surprised at the capacity of even poorer communities to raise substantial sums from their residents. (63, pp. G24, G33-G34) The NCDS also requires the syndicate to organize a project committee to be responsible for the project. (63, p. G27)

Thus the NCDS has all the characteristics of a problem-solving organization rather than a typical community development program. For instance, the performance of volunteers was as good or better than the performance of paid paratechnicians. As we saw above, this is typical of the use of local people in the problem-solving approach.

Thus where community development has entered a community with its own objectives, with a technical extension approach, it has had only limited successes. The successes have been where the agents have happened to hit on something the farmers or community wanted; such hits did not happen often. Where community development has been consistently successful, it has used a problem-solving approach.

G. Research

There are two main groups, besides the researchers themselves, that have a major stake in the efficiency and direction of agricultural research: the government or other group which directly or indirectly finances it and the users of research results, primarily the farmers. The users tend to be most interested in the specific results of research; the financers tend to be most interested in getting the maximum results from the resources used.

The first step in efficient use of research capacities is the establishment of priorities which concentrate research on the most critical problems. (513, p. 38; 514, pp. 10-11) This requires decisions on what commodities are to be emphasized and what economic and ecological problems are to be considered when carrying out research. There are never enough resources to do everything, so setting priorities often means deciding what is not going to be done. (233, pp. 21-22) The Chinese, for instance, decided not to compete with other countries in basic research so they could concentrate on adapting existing knowledge to their own needs. (515, p. 186) A World Bank sector survey recommended that horticulture and farm mechanization research should take second place in Ethiopia because of resource limitations.

In agriculture, priority problems are usually those faced by the country's farmers. This seems obvious enough, but it is often overlooked as emphasis is placed not on immediate farm problems but on basic, high technology or prestigious research. (513, p. 40; 516, pp. 25-26; 245, p. 82) The result is research which never gets translated into forms the farmer can use or which fails because it is pushed by extension agents before adequate field and farm economics testing has been done. (73, p. 571) Thus policymakers usually find that the steps which provide the greatest return

for the research investment are those that concentrate research on the farmers' problems. This requires an institutional mechanism that brings farmers' problems to the researchers and returns research results to the farmers.

In Kenya, the two-way flow between farmers and researchers was highly developed for tea growers. There was an efficient local organization for providing information to both the extension staff and the growers. Tea committees -- local farmers' organizations -- not only explained policy to the growers but also conveyed the farmers' problems to extension agents and the other administrative officers who must act on them. After a delay of ten to fifteen years, India began to develop a network of research institutes and to generate a flow of information between farmers and scientists to the benefit of both. (517, p. 36; 49, p. 39) China has encouraged extensive interaction between university researchers and producers. Brazil has begun to develop a dialogue between farmers, on the one hand, and extension workers, university scientists and students, on the other. (59, p. 31)

If research is to be applicable by the smaller farmers in the society as well as to improve productivity, extra efforts have to be made. Even though tea growing technology was successfully adapted to smallholder production conditions, thus showing that it could be done, most Kenyan research largely ignored the needs and constraints of the small farmer. Research and extension were poorly coordinated for small farm crops like maize, especially when compared to the service provided tea growers. Food crops research was neglected and there were no research trials in situations similar to those of small farmers.

In India, at one point 90 percent of the funds set aside for technical assistance to smallholders remained unspent because of various purely administrative snags. (517, p. 39) There was little research on improving or developing tools for small scale farmers. (364, p. 268) In Latin America research policies often led to aggravation of income maldistribution as findings were appropriate only for the larger scales and better lands operated by large owners. (280, p. X19) Research and extension services lacked effective links and often were antagonistic towards each other. (296, pp. 105-107) This was also true elsewhere. The seven intervening levels of organization between farmer and researcher found in Ghana posed an almost impossible communications barrier. Research and extension were also virtually totally separated. (198, pp. 67-68)

Other types of research, as well as farm research, should concentrate on the problems and objectives of the research user. In East Pakistan, now Bangladesh, the Academy for Rural Development was established to conduct research and the training of civil servants. (275, pp. 672-673) What made this effort notable was the close link of the Academy to the existing administrative structure of the area where it was located. This made it possible to select problems from, and test solutions in, conditions which were typical

of the province, e.g., test solutions with the people who would have to carry them out. (490, p. 7) The Chinese linked administration and research by giving local authorities at all levels considerable latitude to experiment with different types of development programs. Successful programs were then widely publicized in emulation campaigns. The Special Rural Development Program in Kenya also experimented with government problems.

1. Agricultural Research

In the past, the most effective research was organized on a crop rather than a disciplinary basis. (233, p. 25) Crop research was especially successful for high value crops like tea, coffee, cocoa and rubber. Concentration on a crop not only helped insure the cooperation of all the skills necessary to solve particular problems but also made it easier to concentrate research on the particular crops with the highest priority. The International Rice Commission had three separate groups working on breeding, fertilizer use and agricultural engineering for twenty years. It was not until all basic questions were attacked at one center, the International Rice Research Institute at Los Banos, that a breakthrough was achieved, in five years, in the form of a high yielding variety of rice. (518, p. 30) The high yielding variety programs in Mexico also had a multi-disciplinary crop concentration. Taiwan has a highly successful system of crop-specialized research organizations closely tied to their extension system. (475, p. 39)

One limitation of single crop research programs, however, is that many farmers are not single crop growers. Where farmers are growing more than one crop in succession each year, increasing yields for a crop may not help a farmer as much as reducing the growing season if this allows the growing of a second or third crop. In fact, the farmer may be better off with reduced yields of particular crops if he can increase the number of crops grown. In many parts of the world farmers interplant different crops together. At Puebla and elsewhere, it was found that interplanting was sometimes more profitable to the farmer than planting single crops.

In many parts of the world, maximizing income on farms means reducing the agricultural labor needed. In Japan and Taiwan off-farm employment in rural industries is turning most farms into part time operations often run by women, children and older persons. In much of Africa, farmers seek to reduce labor time used to grow subsistence crops, without giving these crops up, in order to spend more time on cash crops. In most of Asia, much of a farmer's cash income comes from day labor, cottage industries or other activities other than working his farm. These farmers also find that maximizing income means reducing farm labor needs. Unfortunately this need to reduce labor use in agriculture is directly contrary to the trend of most single crop research which is to use more inputs which require more use of labor. Labor saving research often concerns types of mechanization which replace farmers and farm labor rather than help small farmers.

Finally since subsistence farmers are reluctant to give up food production, it may be better to introduce cash crops that can be grown in combination with other crops. Thus in Latin America, plantain has been planted with coffee. In Costa Rica, the early tobacco harvest allows farmers to grow a second crop on land with some residual fertilization. Not only does this lower risks, it grants the farmer some protection against a monopsonistic buyer for his cash crop. Some crops, such as bananas, may not be as easily combined with other crops. (296, pp. 498-499)

Thus it is necessary to research ways to do more than maximize output of a crop or income from a particular crop. It is net farm income that must be increased. This may not mean increasing the yields of a particular crop but decreasing the inputs, including labor and time that are required. This is especially true of research for small farm agriculture. Strange as it may seem, small farms, because of their diversity of activities, are often more complex economically than large commercial farms that may concentrate on only one or two crops.

Some research programs are beginning to recognize the need for a whole farm approach to agricultural research. The Masagana 99 program in the Philippines developed what they call "test bed research" to see if new crops, varieties, practices or combinations of these would work in the social and institutional environment of the farmer. This type of research follows the adaptive research needed to show the physical and biological viability of the new practices. It concerns itself with determining the needs of the farmer and the institutional requirements (e.g., credit, markets) if the new practices are to be a success. (392, p. 1) This research has shown the greatest potential in dealing with the diversified type of farming used by small farmers and in minimizing the need for purchased inputs which is especially important to the poorest farmers. (519, p. 7) USAID recently provided a grant to Nepal for an integrated cereals project that would look at increasing farm income rather than the output of a particular crop. This project provided for a multidisciplinary team to be directed by agronomists whose job was to direct the research towards the needs of small farmers. It was also a multidisciplinary team that widened the area of research at Puebla to include factors such as interplanting.

Thus, especially when researching the problems of small farmers but also when dealing with any farm unit that grows more than one crop or spends significant amounts of time on more than one economic activity, it is necessary to concentrate the research on increasing farm income from all activities rather than just increasing output or income from each crop individually. Failure to concentrate on farm income has led to the rejection of innovations resulting in neither increased output nor increased income.

2. Farmers and Research

Unfortunately there are shortages of research personnel in most developing countries. (520, pp. 14-15; 242, p. 6; 177, p. 170; 169, p. 65; 475, pp. 26-27) For some time in the future these shortages will continue to exist. If development is to proceed as rapidly as most countries would like, research on a broad front must proceed in spite of such shortages. Ways to expand or supplement domestic research capacity are highly useful. (105, pp. 386-387; 521, p. 76)

One method of expanding research capability is the use of international research institutions or foreign researchers. Many key breakthroughs in agricultural research were made by such institutions, e.g., the high yielding varieties of rice and wheat. (514, p. 5) Increasingly such research is being organized on an ecological zone basis and is being widened to include more crops which are specific to certain zones or which make up smaller parts of food intake, e.g., legumes. (522, p. 41; 523, pp. 45-46; 525, p. 15) Often such research has special advantages, such as international financing and the ability to draw on genetic resources from all over the world. International work is also beginning to be done on non-technical subjects such as agricultural policy, income distribution and rural-urban migration.

No country, however, can rely on such research for all its needs. New problems, e.g., new plant diseases, keep arising which a competent research service must be able to at least monitor even if they must rely on outside sources for solutions. (213, p. A139) The process of development, e.g., irrigation and drainage development and changes in soil conditions due to fertilizer use and multi-cropping, changes the ecology of a country and leads to new research demands. (241, p. 27) Technologies produced in developed countries are often inappropriate for developing countries because of differences in climate and conditions or because the technologies are labor saving. Even when appropriate, foreign technologies usually must be adapted to the particular conditions in a country and field tested. (472, p. 191) These steps require extensive research capabilities.

One way of quickly expanding the research capacity of a country is to involve farmers in research tasks. The Puebla Project in Mexico conducted its experiments in farmers' fields using the farmer as the experimenter. Farmers were compensated for any losses incurred. This turned the whole region into an experiment station and meant that experimental results could immediately be interpreted as recommendations for farmers without further adaptive research. (460, pp. 67-70) This same method has begun to be used to develop specific recommendations for various types of small farm and soil conditions in other parts of Mexico. (459, p. 9) Coffee research in Costa Rica was also done by experimental demonstrations on regular farms. (296, p. 354)

Early Japanese agricultural development began in the 1870s and 80s with farmer innovations, many of which were only later taken up by the government and spread to other areas. Initially the government attempted to imitate large scale western methods of cultivation but this failed. Then they turned to promoting the best of traditional technology. Traditional varieties were improved and the improvements were often made by farmers. Innovations originating outside government research organizations included the planting of rice seedlings in rows, a seed selection method using brine, improved plows, the rotary weeder and the treadle threshing machine. The government promoted local meetings and agricultural improvement societies to exchange information and techniques. Some farmers were appointed as instructors at the newly established Komaba Agricultural College. Other farmers were hired as "itinerant instructors" to tour the country meeting with farmers and demonstrating improved farming techniques. (322, p. 295; 366, p. 61)

China seems to have gone farthest in encouraging farmer research and was successful enough so that current trends are towards reinforcing the farm level research effort although professional research, tied to local problems, is not being ignored. (515, p. 186)

Often farmers develop new techniques entirely on their own. Japanese farmers moved to the northern island of Hokkaido where, despite expert advice that rice was not suitable to Hokkaido, they experimented with new seeds and practices until they made rice not only a suitable but a prolific crop. (381, p. 44) In West Pakistan, farmers in unirrigated areas experimented with high yielding varieties and adopted them in spite of extension and research neglect. (207, p. 16) In Colombia, a cooperative promoted, tested and financed a series of new specialty crops tailored to the needs of its small scale production units. (117, pp. 10-11)

Farmers can be integrated into research programs with the same approach suggested above for using farmers in agricultural extension. Many of the successful demonstration programs had a large experimental component. This may seem strange to those who see the farmer as ignorant and conservative, but is less strange when one realizes that adopting a new practice is always an experiment. It is the farmer who must integrate a new practice into the pattern of his economic and social activities. (182, p. 69) The view that farmers must simply follow the instructions of agents who already know the right answers, has led to many extension failures.1/ The recognition that farmers have to experiment,

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1/ Highly centralized or regimented societies are especially vulnerable to errors in failing to farm-test new practices since they can enforce the use of practices which are wrong. Some of China's early agricultural policies nearly led to disaster before farmer-oriented policies were adopted. (515, p. 21)

to adjust practices to their own conditions and that, therefore, farmers and extension agents must work together as collaborators, not just as students and teachers, was the basis of many successful extension programs.

The use of farmers as researchers allows the combining of localization trials and farm economics research into one phase. The same field trials which test the suitability of a variety or practice to a new environment also test the economics of the variety by determining whether the farmer who had done the test or his neighbors are willing to adopt the variety or practice in their own farming. This greatly simplifies the extension agent's job as there is no longer an artificial distinction between farmer and experiment station conditions.

Use of on-farm experiments to test farmer acceptance of new practices can also replace much of the difficult analysis, complicated by social factors and traditions, of farm economics. (39, p. 3) Farm economics analysis is expensive when done by researchers on experiment stations and is beyond the abilities of most extension agents. (182, p. 82) Lack of information about the farm economics of new practices frequently leads to failure, e.g., new practices often increase or change the pattern of labor demand in ways that farmers will not accept. (399, p. 124; 525, p. 16; 337, p. 38) The best way to test the suitability of a new practice is to see whether farmers who have tried the practice continue to use it.

One expert argues that farmer research efforts would be small in scope and the transfer to other farmers unsure. (67, p. 119) Some politicians feel that simple forms of technology are a backward step. (429, p. 16) In practice, however, the results of farmer research have been distributed through extension systems just as well as the results of more expensive experiment station research. What farmer research lacks in prestige is compensated for by practicality and relevance to actual farming conditions and the greater ease in finding a technology that fits local economic and social conditions. (467, p. 336; 337, p. 35) Development of traditional practices through use of farmer researchers and the tying of such research to professional research institutions helps avoid the problem of researchers who ignore the situation in which their findings are to be applied and thus invite rejection of their findings, and who, in ignoring traditional practices, fail to see the important economies and efficiencies of traditional farming. (513, p. 40; 337, p. 38)

3. Research Organization

If limited research capabilities are to be fully used, research work must be carefully coordinated. The most frequent recommendation for the solution of coordination problems is the establishment of an Agricultural Research Council. (422, p. 131; 526, p. 117) More such Councils are being established. If they are

to work, however, they must have the authority to make effective decisions. In Kenya, a research council became inactive because it was disregarded by the Ministry of Agriculture. For this reason and to insure necessary central input, such Councils should be closely connected to the central planning authorities. (526, p. 117)

The Councils should also include members representing the research institutions, financing organizations, extension, farmers and other relevant private, government and parastatal bodies. (243, p. 111) In countries having federal systems, e.g., Nigeria, the coordination problem will be especially acute. (144, p. 57; 527, p. 46) If most research is controlled by the national government, special liaison units will have to be developed to represent the state governments in the research priority setting process. If much research is state controlled, then the need for a coordinating council, whatever form it takes, becomes more critical if the national research effort is to be efficiently carried out.

Another solution to the coordination problem is to put the related activities under a single director. (434, p. 33) Ethiopia established a semi-autonomous Institute of Agriculture Research (IAR) to direct their research and began channeling public research funds through this institute. Zaire's research center, INERA, also had independent status and responsibility for all agricultural research but like IAR suffered from a lack of funds. Extension and research can be placed under common direction to insure that both work together to meet the needs of farmers as was done in some Latin American countries. (513, p. 45; 182, p. 84)

Putting all research under one director is not always necessary, feasible or desirable, however. In some countries, the autonomous status of some research institutions, the universities in Turkey are an example, mean that the looser, more flexible form of the research council may be preferable. In India, research organizations themselves coordinated maize research. One institute was selected as a coordinating center for the program. Annual meetings were held to report on work done and outline programs for the next year. (225, p. 39) In countries as large as India, separate coordinating bodies for certain crops or groups of crops are desirable for work coordination even if there is an overall council for setting crop priorities and allocating funds.

A coordinating council and unified direction are not mutually exclusive solutions to the allocation and coordination problems. An agency might unify the direction of its own research or research and extension while a council is established to coordinate with non-departmental research activities.

4. Summary

If research is to be effective, it must concentrate on farm income not just on increased output. This is true of single crop farming systems, where the costs in inputs and labor may not be justified by the limited returns. It is even more true of multi-crop farming systems. The only real test of income producing ability is whether farmers do, in fact, adopt the practice. This means that the farmers must test the practice over the range of conditions that farmers face. The researchers must be prepared to look not just at the biological and economic characteristics of the crop but also at the institutional environment which often determines whether a particular practice is profitable.

Since research resources and capability, like extension resources and capability, are limited, it has proven helpful to use farmers in research wherever possible. This not only reduces research costs but provides for the necessary on-farm research that is otherwise often neglected. For this to be successful there must be a collaborative type of relation among farmers, extension and research personnel. This type of working relation is best established using the problem solving method of extension described above. Technical extension discourages such working relations from developing because of its take it or leave it character. Technical extension research has usually been done professionally.

XIV. EDUCATION AND TRAINING

A. Types of Education and Training

1. Basic Education and Literacy

Basic education and literacy programs have been tried all over the world with two frequent results. First, education changes behavior and attitudes enough so when the student returns, the community finds it difficult or impossible to adjust to the student. The student has invested so much time and effort that he finds it difficult or impossible to fit into his old role again. Education qualifies him for jobs that don't exist in the village. (387, p. 32) The result is conflict. The attractions of the city and the student's plight at home end in the flight of the educated from rural areas. (388, p. 70; 389, pp. 6-7) The leadership potential that education creates is lost to the rural area. This is especially critical because the level of education in rural areas is lower than urban levels to start with. (389, pp. 6-7)

In the cities there are often more literates than there are useful jobs. The result is overstaffing of the government -- the major employer -- and discontent centering on the educated unemployed. These literates have not been trained in necessary skills and are fit to do little else but get more training. This problem is compounded by professional training programs that prepare people for jobs that don't exist or train them in the use of methods and equipment and to solve problems not appropriate to their country. As a result the educated often become unemployed at a higher level of education or emigrate to developed countries. (390, p. 24) In the 20 years prior to 1967, 30,000 foreign engineers remained in the U.S. after completing training. (387, p. 32) An ever increasing number of doctors in the U.S. are Indian or Philippino.

The second result of literacy campaigns is high dropout rates and a relapse into illiteracy after a short time. In Ecuador between 40 and 70 percent of the students dropped out of six-month adult education and literacy courses. When they completed one level of education, they failed to show up for the next. (391, pp. 10-11) Three months after completing a literacy program, many farmers had forgotten how to write their names. (90, p. 53) Regardless whether the trainee forgets or leaves, there is no significant direct contribution to agriculture or rural development.

a. Rural Formal Education

Rural people want schools for their children. They want schools so their children, or at least one child, can get out and get a job with the government or elsewhere. (392, pp. 143-146;

393, p. 85) People are willing to put their own resources into school systems, e.g., building schools through community development programs as in Venezuela and Thailand. (394, pp. 137, 143; 313, p. 14) But this is so their children can leave agriculture. (395, D 2, p. 10) A threat to limit access to free public education, the peasants' only way of escaping rural poverty, led to an uprising in 1969 in Peru. As a result the government had to back down. (396, pp. 2-7) Nowhere in the developing world is there a significant demand for education in order to work in rural areas although there is no lack of demand for public education.

Public education has done little to encourage agriculture and rural development. It has been primarily preparation for more education. (397, p. 163) Rural schools have not taught agriculture related subjects nor have they taught standard subjects, such as reading and mathematics, in ways that relate to agriculture. In Ghana for instance, formal agricultural training was introduced into the country's schools only recently. Elementary schools were restructured to provide occupation oriented studies in the ninth and tenth (final two) years of schooling. However, this led to students being "exposed" to agriculture rather than trained in it. There was strong opposition to the planned increase in the teaching of agriculture in secondary schools and where agriculture was taught the weaker students were the ones encouraged to study it. (198, pp. 52, 91)

A number of countries and projects are trying to introduce agricultural and other job training into formal schooling systems. Although this change has been recent it is now frequently recommended. (365, pp. 12-13; 397, p. 163; 398, p. 22; 399, pp. 216-217) In Egypt school programs were adjusted to provide skills in agriculture, handicrafts, agricultural industries and home economics as well as literacy and other academic preparation. (400, pp. 81-82) The Rural Education Centers in Upper Volta provided basic education, non-formally, as well as preparation for specific jobs. In Botswana academic subjects were combined with practical training and the creation of new opportunities for self-employment. (398, p. 24) Thailand considered reorganizing primary education so that in early years the study of rice or maize production, care of livestock, etc., would provide knowledge, experience and practical topics for the teaching of reading and writing. At higher levels other practical subjects would be integrated with the teaching of academic subjects. (401, pp. 41-42) China, Sri Lanka, Kenya and Cuba also worked on integrating formal and practical training. (399, p. 217)

It is not certain, however, that even these measures will stem the outflow of educated youth from agricultural areas. A recent study of vocational school graduates in Thailand found they were readily employed but that increasing numbers of the graduates were entering higher level institutions and taking subjects unrelated to their vocational training. (398, p. 45) In Colombia, a coffee organization ran twenty schools for nine to sixteen year olds. Over

one third of the course time was spent on farming and older students were lent money -- without losses -- and land for supervised agricultural projects. In spite of this, school leavers still preferred to go to the cities. (402, p. 3) Graduates of practical farm schools in Sri Lanka were unable or unwilling to become farmers and instead tried to get government jobs.

In French West Africa some parents disapproved of introducing agricultural subjects and making training less formal as they felt the rural orientation lowered the quality of education. (301, pp. 155-156) In Upper Volta, a technical rural education program for young farmers was insufficient to permit easy emigration to cities. Unfortunately, it did not do much to improve rural life either. (403, pp. 360-361)

Although these changes may have only a limited impact on the level of rural education, they still seem to be highly desirable. First, Japan, Taiwan, China, South Korea, and Israel all had strong policies to improve the education of their peoples and specifically to improve the job skills of their people. These countries dispersed education widely and moved away from classical towards technical based education systems. (366, p. 60; 74, p. 42) These countries were unusually successful in agricultural and rural development.

Second, there is a tremendous imbalance between the numbers of students from rural and urban areas in developing countries. In Latin America, for instance, UNESCO estimated that for every thousand students in middle schools, only 26 in Colombia, 38 in Costa Rica, 66 in Chile and 39 in Panama were from rural areas. The number of rural students per thousand in the universities were much lower than even these figures. (391, p. 8) Thus any representation among the educated elite that rural areas can achieve is an improvement.

Third, as discussed elsewhere, there is strong reason to believe that learning is improved when based on practical experience regardless of the subject. Some even argue that "without a genuine problem there is no learning." (238, p. 356) Since agriculture is the subject rural students will most easily relate to, it may provide the best basis for rural school learning even for those students who go on to non-agricultural training and jobs.

b. Adult Literacy

Although adult literacy programs have often had dropout rates and low levels of retention of literacy, some programs have been successful. Paulo Freire and others have pioneered a system of literacy training based on developing the trainees' awareness of their political and social environment. Key themes in that environment are identified and key words that are central to these themes and which have considerable significance for the trainees are used to begin training. Because the trainees have strong feelings about

these words, the key words are easy to learn. Because of their increased awareness of how these concepts relate to their environment, they are eager to extend their knowledge to new concepts. This basic vocabulary is then used to teach the sounds of various letters and thus to extend the ability to recognize words beyond the key words vocabulary. This method has been successfully used with adults in Brazil and Chile. (404; 405)

The Ashton-Warner method of reading instruction is similar to Freire's except that instead of having the staff identify key words and themes and instead of developing awareness of the social and political context of these words, the trainees are asked to pick their own key words. These words are words that have special significance for the trainees personally. Again because these words have special significance they are easy to learn. Ashton-Warner called them "one look" words. After a small vocabulary of key words has been mastered they can be used to learn sounds and hence other words. These words are used to read and write about themes, usually the key words, that are important to the trainees. This method has been successfully adapted to teaching adult literacy in Ecuador. (406; 391, p. 80)

These two methods have many common elements. Both rely on the selection of key words of strong emotional significance to trainees to hold attention and introduce basic sound-letter combinations. Both use the elaboration of themes surrounding the key words to hold interest, develop skill and expand vocabulary. Both teach reading as an active process in which the trainees learn to read by and in order to express their own feelings and achieve their own objectives. The two methods differ from each other in that Freire uses themes that are political. The staff takes the initiative in identifying these themes as the trainees are initially politically naive. Ashton-Warner uses themes that are more psychological and individually selected by the trainees.

Another way of generating interest in literacy is to link literacy to learning other things the person wants to know. Tanzania has used basic education primers on subjects like growing better cotton, taking care of cattle, fishing, etc. In each case these primers are used in the areas where that particular crop is important, e.g., along the coast for the fishing primer. These primers start with simple words and ideas like "cotton," "money" and "cotton brings in money." (407, p. 34) This method has also been used in other countries and projects.

All of these methods are ways of helping participants learn to sound out words. The big difference between these and other methods is that these methods make learning sounds easy by starting with words of high significance. The memorization aspect is made easy. Further, by concentrating the work on themes of intense interest, the students' attention is maintained during the course and afterwards so the literacy skills are fully developed and maintained after the classes cease. Thus these methods overcome the motivation problems that have afflicted many adult literacy programs.

The desire to read and write is not instinctive, nor do farmers look upon reading as good in itself. Farmers normally learn to read and write when they need to and adult literacy programs have not usually been successful until the need for literacy has arisen. (90, pp. 52-54; 408, p. 2) Where farmers had a need to read, as did farmers who wove and sold cloth in Ecuador, they learned and were especially prone to send their children to school. (90, pp. 53-54) Where the need is less immediate, the successful literacy programs have been those that created and sustained student interest through emotional involvment with the subject matter.

c. Maintaining Literacy

In Thailand the Department of Elementary and Adult Education found that one third of those who finished grade four forgot how to read within a few years of leaving school. In order to make reading material readily available, and hence to encourage people to maintain their reading skills, the Village Newspaper Reading Center Project was started in 1971. Seventy-five reading centers were set up in one area. Each center received three different newspapers daily, a bi-weekly magazine and other reading material. These centers were so well received that by 1976 they were to be expanded to 7725 centers. (395, Annex C, pp. 16-17)

In Mali, a monthly rural newspaper was created especially to provide reading material for new literates in Bambara, a Mali language. This was essential as there was little reading material available in Bambara. The newspaper included articles on health, agriculture, education, local events and some national and international news. (403, pp. 231-232)

The University of Massachusetts project that adapted the Ashton-Warner method of reading instruction discussed above, was also interested in making materials available so literacy would be maintained. Considering newspapers too formal and sophisticated, the Project experimented with a type of photographic comic book popular in Latin America. These were usually urban oriented and contained love and action stories. The themes, characters and settings were changed to fit rural conditions. The project also considered the duplication and distribution of stories and articles written by the more advanced Ashton-Warner groups. (406, p. 13)

In Tanzania many supplementary reading materials were developed to help new literates maintain their skills. Reading rooms were established in ujamaa villages. Most of the materials are practical although a few books of poems and fables were printed. A network of newspapers was also planned but ran into implementation problems due to long delays in getting parts for presses. (407, p. 35)

Thus, many countries have found that it is not enough to simply teach literacy. People must also have materials of interest that will maintain and develop their literacy skills.

d. Rural Education

Where rural education has been successful for adults it is where people have found literacy or other education skills useful. If the immediate usefulness of literacy is not apparent, success has sometimes been achieved by developing training methods based on concepts of intense interest to the student. Literacy skills have been maintained by insuring that appropriate and interesting reading material was available. This has included providing reading material written especially for the new literates and providing reading centers with a broader range of reading materials.

Education for young people has often led them to leave rural areas for hoped-for jobs in cities. The attempts to adjust rural education to make it more relevant to rural life and to encourage educated young people to stay in rural areas has not been completely successful. However, this should not be looked on entirely as a failure. In most countries, rural conditions are such that the desire to leave shows a certain amount of good sense. It will take more than better adjusted education to keep people in rural areas. The conditions and prospects for people in these areas must be improved. The Extension chapter offers some examples of programs that succeeded in cutting the flow of people to cities.

2. Professional Education and Training

Most developing countries have shortages of certain types of skilled manpower and surpluses of other types. Highly but non-technically educated manpower is often surplus; technical manpower is often scarce. (28, p. 1178; 46, p. 40; 154, p. 3) These shortages are more acute in agriculture than in other sectors because agriculture has been neglected and because the need for technical manpower is especially great if the complexities of agricultural development are to be managed. (409, p. 16; 233, p. 25; 362, p. 45) Furthermore, these shortages are likely to continue for some time. (213, p. A141)

To a limited extent, manpower shortages can be overcome by the use of foreign experts and training institutions. (410, p. 77) The World Bank, for instance, has both supported the development of a corps of skilled project managers in East Africa and has also recruited, through various arrangements, expatriate project managers for many Bank projects in Latin America, Africa and Europe. The Bank has been a strong advocate of foreign experts, recommending, for instance, that Tanzania relax its policy of self-sufficiency and import research staff, commodity specialists, regional agriculturists, management consultants and land-use planners.

The value of foreign experts can easily be over-estimated, however. (28, p. 1178) The World Bank admits, for instance, that language barriers and lack of local knowledge and continuity limit the usefulness of foreign experts. Trying to staff middle and lower level positions with foreign technicians would be an expensive undertaking. Finally, use of foreign personnel can only aggravate

the problem of lack of high level experience that plagues many developing countries. At most, foreign experts can be of help only for a fairly limited number of usually high level positions or for specific priority projects, e.g., Iran had the Food and Agriculture Organization of the United Nations help on some fifteen general reconnaissance surveys for a new Ministry of Water and Power. (411, p. 114)

For most of their manpower shortages, developing countries will have to rely on their own resources. This, however, may be difficult. Resources available for manpower development will be limited even if given the priority they deserve. (28, p. 1178; 154, p. 3) Teachers are frequently in short supply. (397, p. 157) Most school leavers have little experience or instruction in agriculture-related subjects, e.g., in Ethiopia. Thus, the base for expanding skilled agricultural manpower is small.

a. Formal Professional Education

Frequently experts in developing countries recommend more training. In some cases they come very close to saying that with training, the more the better. The United Nations, for instance, recommended that extension services should employ the best trained people available. (412, p. 29) Usually this would mean a full university training for each agent. Formal education has often failed, however, to increase an extension worker's effectiveness. Highly educated extension workers, often with little practical knowledge of farming, found it difficult to make contact with farmers. Farmers detected their ignorance of practical matters and tested them, exposing their lack of practical knowledge in Africa and India. (231, p. 72; 275, p. 681) In Kenya, extension workers with a primary education had more agricultural knowledge than those with a secondary education. (231, p. 72)

In Pakistan a training program for extension agents found that the agents were unable to go beyond oral and written responses. They were unable to actually practice or demonstrate their skills. Veterinarians had never castrated a bull calf; horticulturists had never pruned a tree; extension specialists had never organized an activity, club or council in a village. IRRI in the Philippines tested several thousand extension workers, supervisors and agricultural experts on their ability to identify and prescribe for various rice diseases and pests. Only 25 percent of the questions were answered correctly by the groups. (413, pp. 8-10) The worker can't convey his enthusiasm for what he recommends unless he can do the work himself. (388, pp. 92-93)

A comparative study of two Nigerian extension programs found that levels of formal education, previous job experience and tenure did not make any difference in job performance. Pre-service training for both groups concentrated on understanding subject matter areas abstracted from farm problems and provided neither skills nor methods for dealing with farmers and their problems. Only in-service training had a significant effect on performance and even

that was slight. (414, p. 64) China suffered severely during the Great Leap Forward from cadre who had the power to decide but lacked any practical knowledge of planting distances, ploughing, soil moisture, varieties of crops, soil fertility and fertilizers, and water conservation and management. (68, p. 51) This lack of practical skills is found in most developing countries. (413, pp. 9-10; 415, pp. 49-50)

Extension agents lacked practical skills because they were mostly from urban areas and because their training and education had not gone beyond theory to practical work.1/ In Latin America and Asia this emphasis on oral and written work led to and supported an identification of practical work with low status jobs and an aversion to getting their hands dirty.2/ (413, pp. 8-9; 388, pp. 92-95; 275, p. 675) In Africa, training is also largely academic and inadequate or irrelevant. Formal education has been more successful at preparing people for more formal training rather than preparing them for work. (416, p. 9; 395, D2, p. 10; 219, p. 147)

Thus a frequent recommendation of experts on agricultural education and training is more and better preparation on practical work in agriculture -- being able to do the job. This means both practical work in school and field experience. (399, p. 242; 144, p. 14; 415, pp. 49-50; 401, p. 27) Some training institutes are beginning to take this to heart. In India, the Punjab Agricultural University provided a dormitory on-campus to encourage farmers to come to the university. Faculty went into the villages for teaching examples and research. The University had its own farm advisory service in every district in the state. In Sri Lanka, a simple hut in one district permitted overnight stays by students and staff of one institute. As a result, the institute developed close connections with the people in this district. (415, p. 51) Agricultural degree students in Sri Lanka had to do a field survey in their final year and in Korea, rural development staff worked through high schools to give students field experience. (415, p. 50) In the Brazilian Northeast, considerable geological survey work was done by students as part of their geology programs at universities.

1/ One observer notes that "the more extension experts involved themselves in 'models' and 'systems', the farther they got from the farmer and the greater irrelevance they achieved." (163, p. 2128)

2/ One observer notes, however, that many of those who are reluctant to dirty their hands may be reluctant because they can't do the job. Lacking confidence in their own ability to do what they have been trained for, they would rather be thought a snob than a fool. (412, p. 9)

At Bukalasa Agricultural College in Uganda, one year of a three year program was spent (in groups of ten students) working and managing one of three small farms on the college farm. The remainder of the college farm was divided up among the courses taught and the instructors ran that part of the farm concerned with their subject. Subjects included pigs, poulty, cattle (2 groups), sheep, coffee, bananas, citrus orchards, forestry, market gardens, demonstration plots (2 groups), small holdings (3 groups), buildings, mechanics, carpentry, tractor driving and oxen training. Students rotated among the groups for practical work during the other two years of their training and had to select from among these areas in managing their farm for a year.

One of the biggest problems with this program concerned the division of responsibility between the farm manager, who was responsible for coordinating all farm activities, and the teaching staff, who were responsible for their particular areas. The other big problem was getting the staff to put in some time on the farm outside normal work hours. This was essential as much of the student work was during these off hours.

This program not only provided practical experience, it also made sure classroom instruction and field work agreed. The staff were also able to try out practices on the farm. Finally, and most importantly, the program turned out students with an interest and feel for agriculture and farmer problems. (295, pp. 176-181)

Students at the University of Dar es Salaam's Agricultural School at Morogoro, Tanzania, spend one of four terms in the field in each of their three years at the college. In each field term they work in two different areas for five weeks apiece. By the end of their three years they have worked with a variety of practical problems in many parts of the country. In addition, during the remainder of their college time they are assigned to help nearby communities with their problems. The communities and farmers define the problems and students are matched with problems according to the students' interests. (407, pp. 19-20)

The Malaysian Agricultural University at Serdang assigned plots of land and some capital to teams of students. The students could grow what they wanted but they had to farm themselves and buy and sell in the local market. (401, p. 41) Each year they got more land but had to finance their expansion from previous crops. Profits beyond their costs went to the students. Intermediate agricultural students in Fiji were supplied with a piece of land to farm for a period after their academic studies. They also kept any profits they made. (331, p. 157)

One Asian agricultural university replaced its former first year courses -- subjects like chemistry, physics, mathematics and botany -- with courses called: Practice of Rice Production, Practice of Wheat Production, Practice of Livestock Production and Practice of Farm Mechanization. They also attempted to weed out students with no real interest or aptitude in agriculture. (395, Annex D2, p. 8)

The one country that has gone the farthest with integrating academic work with practical training is China. There practical work is a prerequisite for much college level training as well as an aspect of training. Even research is largely directed at practical problems.

Thus it is clear that a growing number of countries are finding ways to integrate practical work with academic training. Equally significant, these countries have begun generating experience that indicates that the trainees from such integrated programs really are more effective in the field. This integration has been brought about in many ways. This indicates that countries can design their own programs once the essential principle of integrating practice with theoretical work is accepted.

b. Practical Professional Training

Training to provide practical experience and knowledge of local conditions can also follow formal education or substitute for it in some cases. As mentioned above in Extension, in Peru rural development workers lived in the country for months at a time. Although this was hard on many of them, it also was an education -- with peasants as teachers. (63, p. L-24) Living and working with the people also made extension more effective at Tumbi in Tanzania. (231, pp. 72-73) An important part of the training and screening of the highly successful Nigerian Tobacco Company extension agents was six months of living in a remote village under the same conditions as farm families. (417, p. 188)

The Demonstration Area Project in Uruguay selected an area of small farmers who were reported to be shy, lazy and hard to influence as a training area for extension agents. This project trained 58 agronomists and agricultural technicians and 66 home economists for seven months each over a period of 10 years. Trainees usually did classroom work (seminars, studies) in the morning and field work in the afternoon. The morning seminars often concerned the field work. Trainees were responsible for extension work but were inspected by supervisors. In spite of the short time in the field of any one trainee, this program was very successful at promoting economic and social development in the area as well as effectively training the extension agents. They were all unusually successful on returning to their own countries as they had acquired the ability to relate their knowledge to practical situations. (58, pp. 52-70)

At the International Rice Research Institute (IRRI) in the Philippines, trainees do everything from ploughing with bullocks in knee-deep mud to harvesting the rice crop. (415, p. 50) IRRI organized and integrated its classroom instruction with practical field training to overcome the lack of skill of their trainees. What the trainee learned in the classroom he could immediately apply to the problems he faced in the field. (418, pp. 46-47) Trainees were taught how to demonstrate to farmers and were required to

conduct actual field experiments, often using varieties of rice they brought with them. They were also required to devise and give a two week course to short term trainees from agricultural agencies. (399, pp. 44-45)

In Cameroon it was recommended that extension agent training should be in short sessions which would evaluate previous work and prepare for future work. Training would be problem and experience centered. Specialists would be brought in to give help and insights on specific issues rather than trying to have agents master various specialist disciplines and then pick out what is useful for their work. It was hoped that this would reduce the temptation of agents to resort to authority by making them more confident of their own skills.

In Malawi the Lilongwe Land Development Program made agricultural graduates understudies to more experienced officers for a season before the graduates were given their own assignments. Officers were closely supervised. Staff meetings were frequent and senior officers spent much of their time in the field with their development officers who, in turn, spent much time working with their assistants. Staff suggestions were continuously solicited and feedback to the staff was usually swift. The resulting on-the-job supervision and experience created high morale and increased administrative capacity among lower level staff. This environment also allowed the LLDP to rehabilitate a number of extension agents taken over from the regular extension service.

The Barpali Village Service program in India provided continuous training throughout the ten years of the project. Initially BVS technicians, who were required to have at least 7 years of schooling and were carefully screened, were given three weeks of orientation on basic methods and techniques. This was followed by a month of close supervision and on-the-job training. Thereafter, additional four day training sessions were held monthly for the life of the project. These short sessions included work trips (e.g., to dig wells, break rocks), technical instruction and instruction in mechanics. (419, pp. 39-40) Barpali was one of few successful community development programs.

The unusually successful National Community Development Program in Bolivia began its agent training with six months of formal training interspersed with one week field assignments with successful Village Level Workers. This was followed by six months of supervised on-the-job training as a Village Level Worker. Beyond this, training continued through periodic regional conferences, bi-monthly provincial conferences and occasional workshops, seminars, and institutes. (420, p. 13)

The Institute of Rural Health and Family Planning at Gandhigram, India had to train family planning workers. In order to prepare this training, the Institute first designed -- based on national guidelines -- and implemented its own pilot family planning program. This program was staffed with members of the Institute who

revised and improved their program and kept detailed records of the time spent, problems encountered and actual skills used in carrying out the program. These records were analyzed and discussed and improvements made until job descriptions and methods had both been confirmed in practice. These descriptions and methods then became the basis for training regular family planning workers. The areas where the Institute had developed their program became the places where trainees were able to practice their new skills. (387, p. 91)

As can be seen from these examples, there is even greater variety in methods of providing practical training than there is in formal training. Experiences have ranged from the several month course of IRRI to the one or two day seminars and field trips of the Barpali Field Service. Theory may be taught separately and integrated through field work as at IRRI. Or the course may be designed around the practical problems of doing the job as in the Indian family planning program and various on-the-job types of training that concentrate on actual problems as in Malawi. Programs may be highly structured, such as in the daily shift from class to field work as in Uruguay, or may simply be a requirement that the trainee live in a village under village conditions for a time as in Peru and the Nigerian Tobacco Company. Again, however, the reason for all these activities was the need to integrate theory with practice, to give the trainee a feeling for what the farmers' problems really are.

c. Training and the Trainee's Organization

In Ecuador many trainees became frustrated because the restrictions of their jobs prevented them from using the training they had received. Change agents were the most successful at using their training since they worked without supervisors being present and usually with small groups of farmers. Health workers were less successful and teachers, under direct day-to-day supervision, were least successful at using their training as their new methods were not understood or approved by their supervisors. (421, p. 86)

The skills to be taught to trainees must not just be approved by their supervisors but also wanted and understood by those supervisors. Where supervisors do not fully understand what their employees have been trained to do, it is unlikely that trainees will have a chance to use their skills. Efforts to acquaint higher level personnel with the training content and how it applies can take place before, during and after training. Ideally there should be some such efforts in all three periods.

One device that is useful for acquainting high level personnel with the content of training is to include these personnel in the training. The Israelis used a three day seminar for senior personnel for this purpose in Gambia. This was coordinated with the main course so regular trainees were able to ask their supervisors what resources would be available, how organization might be adjusted, and whether they would really be allowed to do the things

they were learning. The senior staff began to see themselves in a new role with respect to their subordinates and to realize what the training would actually mean in practice. (388, p. 164) Meetings such as this could also follow the training. (387, p. 81) In either case the arrangements should be made prior to the training to assure that the meeting takes place. This serves to involve the senior staff before the course as well as make them available during or after it.

A further step in this direction is to train staff from each level in the organization. Ideally a training program would include a "slice" of an organization including everyone from the Prime Minister down. In practice much smaller slices are more practical. This does not mean that each level needs the same amount of training. Senior personnel may take much shorter courses than technicians or lower level personnel. The important thing is that everyone have a similar experience and common understanding that makes it easy for them to change their way of working together. The easiest way to get a good fit between trainee and situation is to train as many people in the situation as possible. This was the idea behind the program in Gambia discussed above. (388, pp. 75-79, 162)

Introducing change in an organization or community is often a frustrating and even threatening process for the agent. For this and other reasons, the Israeli foreign extension training program tries to draw course participants from relatively small areas so mutual contact and support can be maintained among the graduates. (388, p. 127) The Israelis also established a magazine, Shalom, to help provide this type of mutual support. Reading about the experiences and successes of fellow students has helped graduates overcome doubts and depression and keep up their efforts. (388, pp. 199-200)

In some cases, however, acceptance by supervisors will be insufficient. Mutual support will be insufficient. In fact, training will be insufficient. In Cameroon, for instance, management problems were so overwhelming in one program that staff would have had no time for anything else even if they had had adequate technical training. In such a situation, training will be ineffective until the situation is simplified enough, perhaps by cutting back the program, so that regular activities can continue. A rural program in Upper Volta suffered from inadequate administrative support and follow-up. One training center had not been open for six months but the trainer was still drawing his salary. (403, p. 358) This type of problem will be cured by better supervision rather than better training.

In the Philippines it was found that extension workers were not lazy, careless nor ignorant, but simply lacked the supplies and tools to do their jobs and the transportation to get to the villages. Once these were provided, the workers were transformed. They became enthusiastic and were willing to work day and night. (92, pp. 90-91) The frequency with which reports turn up transportation

shortages and lack of reimbursement for costs as extension problems, suggest that agents being rendered ineffective by circumstances is a more common occurrence than is generally realized. (196, p. 14) Pay and prestige are also factors which affect both selection and performance. (422, p. 133; 331, p. 151)

In short, it isn't enough to train people. The organizations they return to must be both willing and able to make use of the skills trainees learn. The first step in seeing that these organizations are willing and able is to include high level personnel in the planning of the training. The second step is including high level personnel in the training and allowing a dialogue to develop so everyone becomes aware of what the new skills mean for the organization. The third step is to remove the barriers in the organization that prevent the use of the new skills. This is the hardest job of all but it is far easier if higher level personnel have participated in the training from the beginning.

d. Training to Convey Objectives

In some cases, training has provided a way for higher level staff to communicate with others. For instance, Governor San Luis of Laguna in the Philippines took one of the IRRI short courses to set an example for agricultural staff in the province. (92, p. 90)

In Niger, the head of Health Services wished to convince rural health nurses to develop outreach programs. He hoped to extend the influence of the system of clinics to the 85 percent of the population not reached by the passive, wait-for-the-patient-to-come-to-the-clinic approach of the nurses. Instead of trying to order the change, he held short training sessions to teach the nurses how to use existing records to map and record the influence of their dispensary. The results of these records and maps showing the limited impact of the clinics were so striking that the nurses and physicians themselves changed their conception of the role of the clinics. They began looking for ways to extend care to the whole population and ended up with a volunteer, "barefoot doctor," medical aides program in the villages. (423, pp. 2, 5-6)

Training programs are often a good way to convey objectives. Objectives have different meanings and implications for different levels in an organization. A training environment allows discussion, often with staff from several levels present, that can completely explicate objectives and draw out their implications for different levels. (56, p. 3) This can be a far more effective way of conveying knowledge of objectives than trying to explain them in writing.

e. The Nature of Professional Training

When people think of professional training, they often think of academic training, degrees and classrooms. Experience shows, however, that for training to be effective, the practical content

must be much greater. Not only must practical work be included in or follow formal training to help trainees relate theory to practice, but even to get training accepted by an organization there must be a close examination of the practical problems involved. When practical work and full involvement of superiors are both present, training is effective. The best example of this is the on-the-job training of the Malawi extension program discussed above. Here the superiors were the trainers. The encouragement of suggestions and constant interchange between junior and senior personnel made the whole organization a kind of continuous seminar. Such an environment allows the application of theory, concentration on the practical problems and the involvement of everyone in the organization.1/

3. Farmer and Community Training

In Senegal artisan training programs did not lead to increased earnings for most of the trainees. A follow-up survey revealed this and the training programs were changed. (399, p. 198) The Kenya Tea Development Authority follows up their basic six day tea courses with eighteen separate, one and a half hour course/demonstrations. This training is followed by about six visits each year from an agricultural assistant. This extension program has been quite successful. In Thailand the Mobile Trade Training Schools found that many trainees were getting little or no income benefit from their training. Not only was there no follow up to check on trainees' use of their skills, but this flaw was multiplied by the failure of the training to reflect local skill needs and the failure to provide supporting services to trainees. (399, p. 199)

In another case in Kenya training was fitted to the local situation by dividing farmers into four groups based on their progress in adopting new methods. Extension agents were then trained to deal with each different group and the groups were organized so they could be given the appropriate level of training. After farmers had finished one level they could move up to the next level until they had completed the top level of training. In addition, local officials modified the course content and design to fit local conditions and this modification was a major factor in the success of this training. (231, p. 169)

All these cases represent situations where training success depended on fitting the training to the situation of the trainees. There is also a larger context outside the organization or community which must fit the training given.

1/ This describes also the style of management that has worked so well for the Japanese in all aspects of economic development. See Drucker, Peter. "What We Can Learn from Japanese Management." Harvard Business Review, Vol. 49, March-April 1971, pp. 110-122; and Kraar, Louis. "The Japanese Are Coming - With Their Own Style of Management." Fortune, March 1975, p. 116.

In Upper Volta, a rural training program that was successful in some ways did not attack the main problems of the area such as poverty, poor soil, drought and the farmer's inability to use techniques that the farmer knew were better than traditional methods. The reason for this failure was the lack of institutional support for the farmer so that he could afford to buy the inputs and take the risks involved in the use of new methods. (403, pp. 360-361) The only places where the training was effective, i.e., in use by trainees three to six years after it was given, was where local cooperative groups practiced joint farming or other joint activities using their training. The success of these trainees was not only far beyond that of non-group trainees but these groups increased support for the education program in their areas. This type of follow-up on the courses was recognized by the government as important and the encouragement of such groups became part of the program. (403, pp. 350-351, 359-360)

In another case in Kenya an attempt was made to get nomadic cattle herders, the Maasai, to grow crops. When they attended training they were required to spend part of their time growing garden crops for the training center. There was no follow-up or other changes, however, to encourage crop farming by the Maasai. In spite of the Maasai's expressed need for greater economic security, in spite of their interest in training -- the training began at their initiative -- and in spite of the willingness of the Maasai to take sedentary jobs at a tannery and elsewhere, there is no evidence of any crop growing activity based on this garden crop training. (63, p. D49) Training by itself was insufficient.

A blacksmith training program in Mali was followed up by interest free loans to buy equipment. There was also regulation of the prices and the quality of the spare parts made by the blacksmiths. Twenty-one of twenty-three trainees bought improved equipment and four got welding equipment for repairing bicycles and motorcycles. The program substantially increased the income of the blacksmiths and reduced their working time for various jobs. In Nigeria, however, a small industry project had only limited success at least partly because of the limited demand for the products to be produced. (231, p. 166)

Thus successful training programs for rural people were those that provided skills that people could profitably use and were accompanied by programs, where necessary, to see that trainees had the resources necessary to use the skills. This means that for training to be successful, there must be surveys and follow-up to insure the training is fulfilling a need and to apply and adjust training to the situation. There must be support programs to provide necessary inputs. Markets for output must be present or must be created. (415, pp. 38, 39; 301, p. 156) The same conditions apply to rural training that apply to extension (See Technical Extension for Small Farmers). The big difference is that training requires even more farmer time and effort than extension does.

a. Practical Application of Training

In the LLDP in Malawi, both residential and non-residential courses were used. Both were short: the residential courses lasted as long as a week; the non-residential courses usually lasted one day. The residential courses suffered from the farmers' belief that demonstration farms are government activities irrelevant to their own situations and from other problems. These courses do not seem to have raised agricultural knowledge in the community. The one day local courses were more successful in spite of their lower level of prestige and facilities. More farmers were reached and the one day courses emphasized a few simple points that could be applied immediately.

The importance of immediately applicable material is shown by the difference in results between men's and women's courses. Women's courses related to day-to-day activities and led to immediate application regardless of when the course was taken. This improved learning and also led to more imitation by non-course takers. Agricultural training in residential facilities often preceded application by a full season and, as mentioned above, did not raise agricultural knowledge. To avoid problems with delayed application, training in many developing countries has been divided up into short sessions, scheduled for periods of least agricultural activity and centered on review of the work just finished and preparation for the next phase. Such short, non-residential courses also allowed more specific adaption of courses to local needs. (231, p. 169)

Practical experience in the training of cooperative store managers in Uganda was considered so important that a store was established largely for this purpose. Cooperative staff and employees of cooperative branches were both successfully trained in the store. The store also provided a model (or demonstration) for the branches and established a dealer relationship with suppliers and manufacturers. Not only were branch stores established but the main store did substantially more business than expected. (424, pp. 99-102)

In India, it was found that small-scale entrepreneurs were more receptive to training and advice on technical matters than on management. Technical assistance led to visible, concrete results while management seemed vague and abstract to most trainees.1/ (403, pp. 483-484)

The limit in adapting training to a situation is on-the-job training. Perhaps for this reason some of the most productive training is the experience obtained on the job. (426, p. 20; 424, p. 107) The learning of many new skills, however, requires an

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1/ This lack of interest in management training is widespread in developing countries. (425, p. 50)

environment where the skills may be tried without fear of loss; trying new things is, after all, risky. Some skills may require considerable concentrated effort and this might be difficult to achieve on the job. Hence, on-the-job training will not be appropriate for all skills.

The advantages of on-the-job training are low cost, informality, immediate or early response to problems and immediate application so there is a good chance the training will stick. These conditions apply to many situations that are not often thought of as training. In Pakistan, for instance, a rural works program in which small projects were largely conceived and supervised by farmers' committees had a tremendous training effect since thousands of rural people gained some basic knowledge and experience of engineering, project planning, administration, and payroll accounting. This program also provided training in less tangible skills relating to leadership, problem identification and solving, and use and integration of modern technology. (46, p. 400) These skills were largely a fringe benefit of the public works program. The Chinese have achieved an even greater training effect from self reliance in rural works programs. Unfortunately this type of activity and training has rarely been deliberately harnessed by government programs. (238, pp. 525-526)

Thus a close connection between training content and practical experience is at least as important for rural training as for professional education and training. Because of the lower levels of proficiency required in rural training, however, many more of the skills can be learned on the job, i.e., through learning-by-doing. For learning-by-doing to become widespread, however, the government must encourage or create the types of programs that provide learning-by-doing opportunities and give the rural people a significant role in running these programs. Rural public works are one example of such a program. Other examples, especially rural organizations, are discussed in the Extension and Research chapter.

4. Local Leadership Training

Perhaps the most common forms of local leadership training are those associated with formal organizations. Often complex formal organizations, like western cooperatives with by-laws, share capital, etc., are recommended for and introduced in developing countries. Since these are new forms of organizations, they require considerable supervision and the local leaders must learn many new skills. Both supervisors and local leaders require a lot of training.

In Egypt, for instance, village council chairmen receive training in local administration and local administration law, financial responsibilities and budgeting, council procedures (e.g., agenda, committees, debate and discussion management), group dynamics, leadership and supervision and the theory and principles of community development and how it relates to the village council. (400, pp. 94-95)

The World Bank recommended that Ethiopia expand training in the philosophy, organization and management of cooperatives for agriculture students, for government, academic and rural leaders and for cooperative members. They recommended foreign training for one or two teachers each year from each agricultural school.

In Thailand, a two week course for managers and directors of reorganized multipurpose cooperatives covered fundamentals of agricultural cooperatives, cooperative by-laws, administration, regulations and contracts, duties of members and officers, business and financial management, and policies and procedures for operation. (426, pp. 15-16) The six week course for supervisors covered even more subjects. (426, pp. 8-9) Training for local club and village leaders was done in lieu of general membership training and was more limited in subjects and time (one week). (426, pp. 10-11)

Uganda had a similarly complex training program for western-style cooperatives. (424, pp. 23-24, 28-29, 37-38, 47) Here, although training was extensive, many administrative and facilities problems were encountered in getting it carried out (the training was promoted by Western advisors). (424, pp. 29-30, 40) Staff had to be pushed to conduct member training. (424, p. 30) Comilla in what now is Bangladesh also required a large number of types of training to introduce new methods and to operate the formal cooperative system adopted there. (281, p. 25)

In Taiwan the Provincial Farmers' Association operated a training center and required annual training for one to two weeks for officials and staff of the farmers' associations. This was to insure that they understood the system and its regulations. There were special courses before each election for those who ran the elections and accountants got special training in the financial reporting system. (340, pp. 94-95)

In all these cases the need for training was justified by the poor performance, lack of understanding and lack of basic skills of the cooperative members and leaders, e.g., in Thailand. (426, pp. 10, 14) In some cases this training was successful. More training, however, is not always the answer. In Tanzania trained cooperative staff and committee members had more knowledge and understanding of the cooperative system than untrained staff and committee members. However, the training did not seem to improve the performance of the cooperatives. (399, p. 201)

Training of local leaders may cause as well as solve problems. Freire notes that rural leadership training assumes that the rural community is developed by training its leaders. In fact, leaders arise out of the development of the community. People are selected for such courses because they have already demonstrated leadership in the community. The training often sets the leaders apart from the community. Thereafter they slip easily into manipulating their

community or become strangers to their community thus losing their leadership role.1/ (404, pp. 138-139) The limited successes of model farmer programs discussed in the Extension chapter provide more examples of the lack of success in training local leaders for some problems and conditions.

Extension improvement in Cameroon came down to a choice between two options. The first was to upgrade the monitors who were intermediary between the work teams and the professional staff. These monitors lacked technical skills so had little work except checking up on farmers, an activity the farmers resented. For the monitors to be useful, it was felt that they would have to be trained technically. The second alternative was to drop the monitors entirely and organize the work teams into real teams at branch level (the level above the work teams). Professional staff could then work directly with team leaders and the teams and their leaders would be led to assume more responsibility for supervision and extension at their levels.

The choice faced in Cameroon highlights two alternatives. On the one had, the creation of formal positions requires more formal training. On the other hand, the creation and use of indigenous leadership may reduce the need for training. The discussion of Farmer Organization in the Extension chapter showed that organizations can be created informally by building on previous successes and letting the form of the organization evolve. This drastically reduced the training and supervision needed.

Thus the amount of formal local leadership training required will depend on the formality of the organizations the leaders are to lead. Even a formal organization may require relatively little training if this form of organization is developed gradually from simpler forms over a long period of time. This is the way the Farmers' Associations developed in Japan and Taiwan. A further advantage of this strategy is that simpler organizations may do the job. As we saw in the Credit Section of the Policy chapter, the most successful credit organizations were small (three to nine members) solidarity groups with a minimum of procedures and that required no formal training at all. Thus, because of the high costs of formal training for local leaders, it is always worth looking for a simpler form of organization that will allow people to develop their own leadership and for this leadership to learn most of its skills from experience.

1/ An interesting example of how leadership roles can be corrupted or redirected by development activities and change is provided in 427, pp. 71-79.

Although the use of indigenous leadership and organizational forms can reduce training needs, it cannot eliminate them. Since it is rare that everyone in a community can be trained, there remains a problem of spreading skills from the trainees to other community members.

One difficulty is that single individuals returning to a community may have considerable difficulty getting their community to adjust to their new skills. Individually, they easily become discouraged and quit. A group of trainees, however, not only act on many more people but also support and develop each other so they keep their skills and interest alive. This was previously shown to be successful in the discussion of farmer extension agents. Thus it is important to train several local leaders who can support each other.

In Zaire young men were nominated by local chiefs and were trained in maize production. They received help in establishing their own farms and were often settled in groups of ten so they could support each other in their use of new techniques. Unfortunately this had little impact on overall maize cultivation as this program was in opposition to rather than integrated with the community.

One of the most commonly used ways of preparing communities to accept the guidance of trained community members is to have the community decide whether to accept the training program or who will be trained. A number of examples of this were discussed in the Extension chapter, especially in the section on Farmer Extension Agents. One example is the French rural awakening (animation rurale) program where the community collectively decided to accept the program and selected the trainees. Another example was the University of Massachusetts education project in Ecuador where facilitators were selected by the community.

B. Fitting Training to the Situation

1. Preparation and Follow-up

The chapter on Extension discusses the need for extensive discussion in the community of how changes were to be introduced. An essential aspect of introducing changes into a community is a community role in analyzing the situation and considering the implications of the changes. The same type of discussion has been used after training to successfully reintegrate the trainees into their organization. (387, p. 81) Generally, as we have seen above, the most successful training programs were those that made sure the training offered what could be used and the trainees had help in adapting and using what they learned when they returned to their job or community.

This preparation and follow-up took a number of different forms. In India, family planning trainers actually did the work that they were to train others to do before designing the training. For

professionals, the follow-up was usually with their supervisors and co-workers in their own organization as in Malawi and elsewhere. Local leaders usually needed follow-up with their trainers or others outside the community. This was seen in the barefoot doctors program in Niger and the Ecuador nonformal education program discussed in the Extension chapter. Farmers and workers also needed follow-up as in the Kenya Tea Development Authority extension. Education programs must have follow-up, e.g., by providing reading centers as was done in Thailand.

To see why preparation and follow-up are so important, it is necessary to see how training affects a trainee and his situation. All human behavior takes place in a situation. This situation is largely made up of other people and their behavior. A relatively well ordered community is made up of people whose activities and behavior fit together. Aggressive people go with timid people. Dependent people go with dominant people. People who lack skills and confidence fit in with those who have skills and confidence. (388, p. 69) The community might be thought of as a jigsaw puzzle where each piece uniquely fits together with other pieces.

What training does is take one or more of the people in the community and give them additional skills, knowledge and confidence. After receiving their training, their behavior is potentially different and this raises a problem. The situation may not have changed. The problem would be similar to changing the shape of a piece of a jigsaw puzzle. Unless the adjoining pieces are also changed, the altered piece won't fit.

If training is to succeed, the situation and the trainee must fit. Either the situation must have a need for what the trainee is learning or the situation must be loose and flexible enough to adjust to the changes in the trainee. If the local situation is resistant and rigid, then the trainee has only two choices: he can forget his training, drop his new behavior and return to his old way of doing things or he can become a rebel and go his own way, refusing to fit in. In neither case will the training have much impact on the community, e.g., as in Zaire, discussed in the section on Local Leadership Training.

Unfortunately the need and flexibility of the situation the trainee returns to is never guaranteed. The examples above offer many suggestions on how training can be guided or the situation can be changed or loosened up so that the trainee is accepted and adjustments are made. There are several other ways.

Fitting training to job requirements is a very powerful tool for insuring a trainee-situation fit. The failure to identify the skills needed, e.g., training generalists when no jobs for them are available, is sure to have a very negative impact on training and the programs of which it is a part. (415, pp. 38-39, 54) The Indian Family Planning Program, in contrast, was a good example of determining what skills were needed and designing training to provide these skills.

There are several ways that training can be related to the situation the trainee comes from so that he or she is prepared to deal with that situation when they return from training. Time can be taken to relate training exercises to the specific situations that trainees are from. Possible problems in implementing ideas can be identified and discussed and possible solutions worked out. Trainees can be taught the skills necessary to communicate upward to supervisors and other senior personnel. This was done in Israel and in our own project for extension agents and managers. (388, pp. 115-116; 428, pp. 62-65) In Niger, village meetings often included dress rehearsals for the farmers to practice dealing with merchants or civil servants. (231, pp. 164-165) Before the trainees return to their jobs they can be given time to plan their return, and to discuss their plans with each other and with the training staff. In this way they will have the best possible chance to start off in a way that is likely to elicit cooperation rather than resistance. This was done successfully in the Israeli extension courses and in the course run by the authors. (388, pp. 135-136; 428, pp. 65-66)

Just as a trainer can study the situation in order to fit training to the situation, he or she can also follow up to see if any adjustments need to be made. As mentioned above, this was done in Senegal.

Another form of follow-up on basic courses that is especially common is some form of additional training. In some cases these are simply additional courses. Frequently, however, as at Barpali, in the Bolivian National Community Development Program and elsewhere, this follow-up is a mix of trips to other projects and research facilities, seminars, short courses and work. A several month course for Shell agronomists consisted entirely of such visits, discussions and seminars in two countries. (314, p. 29) Often visits or conferences allow meetings with other professionals in the field and with higher level officials. Such follow-up, in-service training is especially important in agriculture since new research findings are constantly changing and adding to the information that needs to be conveyed to the farmer. (403, p. 533)

Effective training programs were those that made an effort to integrate the training with the needs of the situation the trainee would be in on the job. Efforts to integrate training with a situation can take place before, during and after the training and in the most successful cases takes place in all three periods. Prior to training it is most important to determine what the training needs are and to obtain the acceptance of the group the trainee will be working with. During the training, in addition to the training content itself, it is useful to help trainees plan the application of their training to the situation they will return to or enter. After training, it is important to follow up to see what modifications in training need to be made, to support the trainee in applying his skills and to collect and provide further ideas on activities he can undertake.

2. Education, Training and Preferences

Providing training in particular fields will help alleviate shortages of manpower only if people are willing to work in these fields. Unfortunately, prestige, the existing academic curriculum and civil service or academic job opportunities all combine to attract students away from agriculture. Technical subjects appeal to students only if these subjects offer prestige and career prospects equal to those offered by generalist civil service. (275, p. 675)

Higher education usually commands a higher salary but this often sets up barriers between the agent and the farmer. In Africa, low agent salaries, so living standards are not too different from that of the farmers, have been observed to improve rapport with farmers. Background is also important. The highly educated often come from urban areas. This often means low committment and little understanding of extension work and feelings that agriculture is an inferior occupation. (231, pp. 72-73) Urban backgrounds also make low salaries and living standards much less tolerable. In Pakistan, village workers left their families in towns where health and education standards were better. This separation led to low morale among village workers and to suspicion among farmers who were distrustful of men who leave their wives elsewhere and who don't have the same work schedules as village men. (50, p. 9) Thus even though they were willing to accept the position, these workers were unwilling to do what is necessary to be effective in their positions. (46, p. 74)

Even the unemployed are affected by status, wage and working conditions. In much of Zaire, agricultural work was considered woman's work and had a very low status. Men were reluctant to do such work even when women were over-worked and men were relatively unoccupied. (309, p. 3) Where men did work -- reluctantly -- for wages in agriculture, e.g., on plantations, they were frequently absent; unemployed men brought from cities to the plantations sometimes refused to work. In Kenya, plantation positions went unfilled because of dissatisfaction with wages as well as lack of information about such positions.

There are several solutions to the problem of unwillingness to work or work effectively in certain jobs. Some people have recommended bonding trainees, for short terms, to work in rural areas once they have completed training. (389, pp. 6-7) In Tanzania, agriculture graduates agreed to work for the government for at least five years in return for their free education. (407, p. 21) Others have suggested rural assignments as a necessary part of career progression. For either of these to work it would be necessary to insure that the rules applied equally to all participants. Examples of these in practice, however, are rare.

Another way to reduce reluctance about certain jobs is to recruit on the basis of enthusiasm as well as, or even instead of, academic qualifications. For instance, many extension programs recruit agents from rural areas precisely because rural people find

living and working in rural areas most acceptable. They are also more familiar with rural needs, points-of-view and problems and are less likely than urban youth to want to abandon the rural areas for the towns. (388, p. 70)

At CIMMYT in Mexico the staff developed a way of separating trainees who were really interested in and identified with the research work done from those trainees who were less committed. Trainees were required to do routine tasks such as inoculating plants. This required from ten days to two weeks of wading through muddy plots, often in the rain, giving injections to plants. After the first morning there was nothing further of a technical nature for the trainees to learn. However, there was much to be learned about the trainees. Some trainees worked when staff were around and loafed when they were away. Some trainees reported they were sick. Other trainees were out in the fields doing the work. It is the last group that the staff believed would make up the core of a good research program. (418, p. 41)

Recruiting for willingness to do the job will usually require other policy changes. For instance, the people most suitable for positions as rural extension workers may be progressive farmers but education qualifications may have to be relaxed if farmers are to be accepted for such posts. Not only will changes in standards be necessary, but so will management techniques. Managing people who have learned their skills from experience is quite different from managing school-trained personnel.

A second way to solve the unwillingness problem is to modify the training. This may mean motivational training of some sort. However, changes in attitude are among the hardest things to bring about by training and are rarely brought about by exposure to information or lectures and exhortation. Generally, it takes a new experience to change an attitude, so such experiences would have to be contrived as a part of the overall training situation. (388, p. 113)

The Israelis, for instance, developed a program for overcoming resistance to doing manual work -- getting their hands dirty -- by field workers like extension agents, by putting them in an environment where they saw such work as accepted and expected behavior by people the field workers could respect and then letting the trainees experience the acceptability and benefits of such work. (388, pp. 128-132) A question still remains, however, as to how much of this attitudinal change continues when the trainee returns to his normal work environment.

At the Academy for Rural Development at Comilla, East Pakistan, training for civil servants showed them that farmers were doing things that the civil servants did not believe the farmers could or would do. The training also included group discussions to show the civil servants that their co-workers, superiors and subordinates were also prepared to make changes. This was required to overcome the negative attitudes and distrust of the civil servants. (50, p. 13)

Another way to control trainee willingness through training is to structure the training in such a way that the skills learned apply only or primarily to the job to be done. This can be achieved if reliance is placed on on-the-job training, experience and short courses, refresher training and seminars on specific subjects as the need for such training becomes apparent. (196, p. 14) Non-formal training of this type does not create the expectations that formal training does, although there is no reason why it should be inferior in quality and every reason to think it will be more relevant to rural conditions. (399, pp. 216-217) In Pakistan, for instance, service as an understudy and on-the-job training were found to be the only practical ways to teach certain rural organization skills. (429, pp. 77-78) Since it comes in small, agriculture-specific doses, such improvements do not prepare people for urban positions.

The best approach is a combination of measures. The Etawah Green Manuring Project in India deliberately recruited as few government employees as possible to avoid some of the government stereotypes about government workers and villagers. Personnel selection emphasized aptitude, understanding of rural life and a rural background. Orientation and intensive on-the-job training in the field concentrated on the problem of approaching the people. The project cultivated idealism and most training was on-the-job. The field workers were respectfully treated by their superiors and they, in turn, reacted courteously and respectfully towards the farmers. Gradually, the project overcame many of the human relations problems. (430, pp. 62-63)

The Etawah Project combines many of the methods for ensuring willingness to do the work. There was careful selection for a positive attitude and background that made rural work easier. Training was practical and emphasized the skills needed to make the trainees successful at their jobs (being able to do a job is a big part of being willing to do it). Enthusiasm was cultivated. Finally the climate between workers and supervisors was both encouraging to the workers and a model for behavior towards farmers. The successful extension program in Malawi discussed above had many of the same characteristics.

3. Theory and Practice in Learning

A number of related themes run through the discussions of extension, education and training. Extension works best when it is firmly based on what people already know. Experience is often an effective teacher. Technical extension has not been successful except where certain pre-conditions of farmer experience and knowledge have been present, e.g., farmers must usually have commercial crop experience. When explaining things to farmers, building on their previous experience is usually more successful than introducing totally new ideas.

Training, as became apparent, was most successful when there was immediate application of what was to be learned. Extension agents often need special training in applying their knowledge.

Many schools have developed programs that require agricultural students to actually farm commercially. Where extension agents lack this practical experience they were unable to use or apply their formal education to real problems. Engineers and other technicians have also been found to lack training and ability in applying their education to practical problems. (403, p. 481) Finally, one of the most frequent difficulties of education is the prevalence of rote learning at the expense of technical ability -- the ability to do something with what has been learned. This problem was successfully solved in literacy programs, for instance, by centering the training on themes and words of importance to the trainees and by including a lot of discussion and writing on these themes.

The common thread through all these cases is that what has been successful are programs that have connected the course content to real problems. This means practical work during or immediately following formal or theoretical work. Where application was delayed, the training content was largely or entirely lost. Formal or theoretical training by itself has not been successful except perhaps where the trainees, as in certain technical extension programs discussed above, are sufficiently experienced in the field so that they can apply theory to what they already know. In most cases it takes practice to learn the many fine points in the application of broad principles. (431, pp. 45-46)

One way of thinking of this is to think of formal training, especially theory, as relating ideas to ideas. No matter how concrete the ideas, there seems to be a gap between relating ideas to other ideas and relating any of these ideas to reality. Hence, there is a need for experience to connect ideas to reality. In some cases, the trainee may already have enough experience. His experience is relevant, however, only if the training is based on this experience, based on what the trainee already knows. This requires that the training be tailored to the experience. In most cases, however, it has proven necessary to provide trainees with experience in order for the training to be effective.

This provides a clue to the failure of much formal education and to the success of some training and some formal training that includes provision for practical experience. Education often fails because it teaches only the relation of ideas to ideas. Education and training become successful when practical work develops the connections between the ideas and reality.

Although it might seem that the connection between theory and practice could be established through discussion of real problems, in practice this has not turned out to be true. This does not mean that discussion is not helpful. On the contrary, the best training includes discussion and in some cases <u>is</u> discussion (see Extension, Awareness of Problems section). But discussion works best as a problem-solving device. It is also useful where trainees have experience that can be related to theory in the discussion. The Israeli extension courses discussed above have used discussion to

relate class material to in-country problems. But the trainees here were largely trained and experienced field workers. Practical work was also a big part of the training program. In fact, the Israelis came to think of their courses as a practical application program. They cut back on the subject matter content of their courses and concentrated on methods, on how to apply what the extension agents already knew. (388, pp. 86-88)

4. Problem Solving vs. Training in Problem Solving

Providing experience during high level management and policy courses creates some special difficulties. Simple tasks and problems, even role playing, do not provide genuine experience. The closest that the trainer can come is tasks which are similar to the problems the trainee faces on the job. This, however, raises another danger.

During the Pilot Training Course given by the authors of this study, trainees preferred work tasks that could be applied to actual problems in their countries, and they sometimes modified tasks to fit their own country. The staff initially shared the trainees' view that the value of a task would increase if it dealt with an actual, instead of a simulated, problem, and therefore approved when participants did this. However, when trainees converted a simulated problem to a real one, they often became so preoccupied with the actual problem that they ignored the procedures being taught to improve skills in dealing with problems. Consequently, while trainees might solve the problem, they learned little about how to systematically solve that type of problem. If trainees are to acquire the skills required to solve problems they must concentrate on these skills and take a reasonably detached attitude towards the tasks. Trainees are unlikely to have as strong views about simulated tasks as they do about actual situations with which they have been associated. Moreover, simulated tasks are less threatening to participants than actual tasks, allowing participants to make errors without undue penalties.

Therefore, while the objective of training is to improve skills in solving real problems, during training, tasks that raise simulated problems are likely to be superior to those which deal with actual problems. Only when trainees have learned to apply principles effectively is it desirable for them to deal with actual problems of their country. This is likely to be toward the end of a course rather than at the beginning. (428, pp. 42-43)

Once the course is complete and the trainee is trying to apply his skills on the job, then problem solving is appropriate. Where the training staff follow up to help the trainees make the adjustment to the job, they must be aware that trainees will be less interested in theory and general issues and much more concerned with the problems immediately at hand than they were in training. The Siet Institute in India, for instance, found this difference in orientation during and after training to be important in their training and follow-up work. (387, pp. 307-308)

5. Dates, Times and Places

Another aspect of fitting training to a situation is timing and location. The greater ease in reaching large numbers of trainees with short non-residential courses has been discussed above. In Nigeria, it was found that vocational school graduates capable of passing a government trade test could be produced far more cheaply with evening classes carefully focused than with full-time trade school training. (399, pp. 184-185) The number of applicants continuously exceeded the number of places available for such evening classes. (399, p. 199) In Thailand mobile training groups giving part-time vocational training in communities was cheaper and had lower dropout rates than formal vocational training programs. (399, p. 185)

One reason these programs were successful may have been the low costs for the trainees. Formal training, even when nominally free, requires the trainee to give up the income he would otherwise earn during his time in class and traveling to class. This lost income is a real cost to the trainee. Both the Nigerian and Thai programs avoided imposing these costs since they were scheduled to avoid normal working hours and were given in the locality. (399, p. 197)

For professional staff, or for others willing to attend residential courses, the important factors may not be time or distance. Professionals generally continue to draw pay while at training courses. Rather it is course duration that causes problems. If the course is too long, e.g., a year, it may mean replacements take over -- for good -- the trainee's job while he is away. The trainee may also see extended training as qualifying him for a higher level position, or a position in a different organization, and be reluctant to return to the job he is supposedly being trained for. Short training courses, e.g., three to four months, encourage the sending of the best candidates as the best people who can be more easily spared for shorter periods. (388, pp. 150-151)

For very short courses, there is a tendency for a trainee's work to pile up while he is gone. Appointing a temporary or acting replacement seems less urgent than on long courses. In these circumstances, a week's absence may be acceptable, but three weeks or a month will often be too long. The trainee will not be able to get away for that length of time. Nor will he look forward to the accumulated work when he returns. In this situation a six week course might be preferable to a three week one if it encourages the temporary appointment of someone to carry the trainee's work load.

6. Mix of Trainees

In a course for entrepreneurs in India, technicians provided a theoretical and technical perspective, merchants provided a commercial and marketing perspective, and a few industrial entrepreneurs contributed their particular perspective and practical experience. This exchange among trainees was helpful to all the trainees.

(403, p. 475) The Israelis and the authors also used exchange of views among trainees based on diversity of background to strengthen their courses. (388, p. 120; 428, pp. 40-42)

When a job has diverse aspects, as with the Indian entrepreneurs, then training which includes representatives of each aspect will be helpful. Those who will have to work with diverse groups in their jobs are benefitted also by meeting members of these groups in training so that different perspectives can be exchanged. Where a single technology is being taught, however, e.g., hybrid seed production, there is less need for variety. (415, pp. 42-43) Variety may even be harmful in technical training as what applies to one group of trainees, e.g., those from the dry, temperate north of Mexico, is often inappropriate and irrelevant to others, e.g., those from the humid, subtropical South. Where there is too much variety in a course, especially a technical one, it tends to be boring for some while too advanced for others.

Too much variety may be harmful even in non-technical courses. The Israelis have gradually shifted from giving extension courses for broad groups such as Africans or Asians to giving courses for more specific groups. They shifted to language groups, then to specific countries and finally to specific regions in some countries. Not only was the greater homogeneity found to be desirable but regional courses permitted the training of a larger portion of the extension agents in a region. (388, p. 73)

When a course or courses appears to have too much diversity, it can be subdivided into more homogeneous groups, especially for technical subjects where homogeneity is more important. (388, p. 120) Where conditions are very diverse, it may be preferable to use small, short courses that are adaptable to local circumstances rather than trying to provide training centrally. This was tried in the Pider project in Mexico. This strategy was successful in the non-residential training programs in Nigeria, Tanzania and Thailand discussed above.

In the section on Professional Education and Training it was noted that there were advantages to training people in teams or "slices" of an organization. However, this does not always mean that such groups should be trained together. It was found in India that putting politicians, administrators and field staff from a single district in the same course led to stilted and unproductive discussion. When these three groups came from different districts, discussion was much more open and was very helpful to all groups. They could then afford to be frank with each other. (415, p. 43) Similarly, subordinates and superiors in the same course may lead to more restraint by trainees than is desirable. Reluctance to move beyond polite generalities and deal with real diversity of opinion is a common problem. (387, p. 136)

The reason for having various levels or types of people participate in a course is that they learn from each other. The important point is not that all of a group should be trained together

but that they should all have similar training and should exchange views with people in different positions. If putting people together inhibits discussion and learning, that clearly defeats the purpose of mixing them in the first place.

Thus, the more technical the training, the more homogeneous the group should be. For non-technical training, especially for work involving other groups or organization levels, e.g., researchers with extension agents and farmers, it is beneficial for the trainee to meet with and exchange views with members of the other groups or levels. (388, pp. 189-190) However, it is best that these groups be relative strangers initially to prevent conflicts or problems from outside the training from inhibiting participants in training. Complete strangers, e.g., those from different countries, are too diverse, however, as they often lack a concrete basis for a meaningful exchange of views. The more diverse the trainees, the more abstract and general the discussion must be to include all perspectives. (388, p. 190)

7. Training Evaluation

The analysis presented above throws a different light on the evaluation of training. One observer notes that Upper Volta's rural schools undertook to teach four years of regular primary school work plus technical training in agriculture and related skills all in three years. These unconventional rural schools cost about one third as much for the three year program as regular primary schools cost for their four year program. The observer raised the question of how much was learned and retained under the two systems. (399, p. 185)

The discussion above suggests that even if less total content were retained by students at the end of the course, the shorter, technical program may be the preferred method. This is because the crucial question is not just how much material is in the student's head when he completes the course but can he use it. If there is no work for a student, his knowledge is useless in a development sense. If the student can use what he has learned then no matter how little he has learned, there has been a gain from his training. Thus, education and training programs must be judged on the applicability of what they teach as well as the quantity of material retained by the student at course completion.

In the long run, after say 5 years, quantity retained may be a good indicator of how good an educational program was. Since knowledge unused is quickly lost, if the student retains much, it indicates the knowledge was useful as well as successfully taught.

C. Training, Organization and Technology Trade-Offs

All developing countries find themselves with shortages of many types of skills in agriculture. However, skill shortages are not absolute; they depend on the technologies and forms of organization adopted. A high yielding varieties strategy requires manpower

with skills in seed production, cultivation, fertilizers and pest and weed control. An irrigation and drainage strategy requires engineers and community organizers to get feeder canals dug and maintained but requires few agricultural technicians. The numbers and skills necessary will vary drastically from case to case and strategy to strategy. Where manpower is short, it is best to adjust the agricultural development strategy to make the best use of the manpower available. (234, p. 17)

Simplifying technology is one way to reduce training costs and the need for training. The most successful agricultural development programs have often involved extending the practices of the best farmers or introducing improvements in existing methods. This was the strategy in Japan and Taiwan until after World War II. (366, p. 60; 47, p. 167) Even today technical changes are more gradual in these countries than in most developing countries. This strategy has also worked in China. Building on traditional technology has been successful in Sri Lanka, at Puebla in Mexico and in Africa. Certainly there is a large potential for such improvements. In India, for instance, the difference between average yields and the best yields is far greater than in more advanced countries. Average yields for rice varied between states from 400 to 1200 lbs. per acre; the best yields in crop competitions were 3000 to 9000 lbs/acre. Wheat averages were 300 to 1000 lbs. on average and 2500 to 6000 lbs. in competition. (116, pp. 12-13) Building on traditional technology drastically reduces the amount of training extension and administrative personnel needed. This strategy is also in keeping with the way people seem to learn most effectively. More on this strategy will be found in the Extension chapter.

The advantage of relying on improvements in traditional technology is that it greatly reduces the need for training in new technologies. This is especially beneficial in early stages of development, as it was in Japan, when the potential for extending best traditional practices is the greatest and skilled personnel are rare.

Closely related to reliance on traditional, more familiar technologies is reliance on experience as a way to reduce training needs. Perhaps the most job specific, and widely used, form of training is through experience. In the private sector, much management ability is based on experience or family training and very little on formal training. Locally managed rural development projects may also develop managers prepared to take on larger projects as happened at Comilla, Bangladesh. (46, p. 163) Frequently governments can make use of such experience, for instance, by giving fertilizer distributers responsibility for encouraging farmer use of fertilizer and teaching them how to use it. This has begun to happen in India, where even without government encouragement, fertilizer companies developed a service approach as the sellers market of the 1960's gradually changed as supply expanded. (432, p. A158) Fertilizer companies have also developed successful agricultural services programs in Latin America. Thus the best use of national

manpower may require that the government take an active role in finding ways that the private sector can take over functions that are business related or can be performed on a business basis.

Experience is also necessary to confirm formal training and make it practical. In Tanzania, and elsewhere, for instance, junior staff had few opportunities to gain experience while senior staff were over-burdened due to over-centralization. In such an environment, senior staff will be replaced by inadequately prepared subordinates because experience has not been considered in manpower planning nor in management and administration. This is quite a contrast to the Malawi example cited above. Ethiopia provided for two lines of promotion for their extension service. This made it possible for agents whose primary training was through experience to get formal training at certain points in their career and keeps promotion opportunities open to them. Although it remains to be seen how well this will work in practice, the Ethiopians had the right idea. They provided for using experience in lieu of education at the same time that they encouraged further education.

Remolding the job is another way to reduce training requirements. The very successful extension program at Borgo a Mozzano in Italy, and other Shell agricultural projects, deliberately used farm economics graduates without specialist training. The project managers feared that more or specialized training would make the extension agents less sympathetic to everyday problems and practical solutions. The agent's job was to be a liaison between farmers and specialists, especially nearby university researchers, and contact man for the farmers with industry, market channels and public authorities. His job was to work with farmers, refer farmer problems to outsiders, carry suggestions back to the farmers and monitor the results of these suggestions. (433, pp. 221-222)

At Puebla, the specialists often found they had much the same role. Most of the farmers' requests for help were beyond the scope of the project and agents had to go outside the project to respond to these requests. (271, p. 51)

Extension training offered in Israel is based on the idea that the extension agent should be a problem solver. The answer to a farmer's question is assumed to exist somewhere so the agent's job is to locate this information and get it to the farmer. The result should be a constant interchange, usually via the agent, between the farmer and research or other information or service organizations. (388, pp. 64, 83-84) The state of Rio Grande do Sul in Brazil is enjoying a new and diversified rural life because of just such a farmer-outsider interchange. (59, p. 31)

Thus it is a mistake to overestimate the training required of extension agents. Too much training may build barriers between farmer and extension agent as was discussed in the Extension chapter. For a general extension agent, specialist training is not necessary if adequate information and crop specialists are available. The

agent does not need to solve all the farmer's problems or immediately answer the farmer's questions if he knows where to go to find solutions or get the answers.

The agents must, however, have enough self confidence and assurance about their goals that they can admit when they do not know the answers. This is essential for a problem-solving approach where the extension agent is guided by the problem of his clients. No agent can ever have solutions to all of a group of farmers' problems. In contrast, specialist extension programs work best when there is concentration on a particular crop. Here the agent isn't expected to be a generalized problem solver; he is expected to get the farmers to grow a crop in a particular way. Hence, he needs to know the technology he is pushing.

The amount and type of training an extension agent needs will largely depend on how extension is organized. If the extension officer is promoting a single crop or is directed by an administrative officer with no other technical support or sources of information, then he will need to be expert enough to personally respond to many different questions from farmers. However, if extension and research teams are used, only a few people need be trained in many specialities. For example, several extension workers might be supported by specialists in particular fields who can be called in to handle problems beyond the training of the general extension agent. This requires genuine team organization and team work, however. If there is competition or lack of communication between the regular agents and the specialists or between extension and research there will be bureaucratic infighting and different experts pushing contradictory advice as happened in Africa. (231, p. 65)

Turning over responsibilities to others can also reduce training needs. As noted in the section on Local Leadership Training, training needs can be significantly reduced by adopting simple forms of organization developed through experience. Another way local organizations can reduce training needs is for more responsibilities to be turned over to these organizations. The Kenya Tea Development Authority, the ZAPI (special action zones in French speaking Africa) and CADU and WADU in Ethiopia have all experimented with giving farmers responsibility for providing agricultural services such as extension, credit and marketing of supplies and crops. So far, these seem to be working. (231, p. 184) Many countries have used farmers in extension programs. China, Taiwan and Japan have gone the farthest in turning over responsibilities to farmers' organizations. For more detail on these points, see the relevant sections in the Extension chapter.

The common theme that runs through all these situations is that the training required depends on the objectives, methods and types of organization used. Thus wherever there is a shortage of trained personnel to do a particular job, it is worthwhile to ask if there is a different way to do the job -- or even if the job needs to be done -- that requires a lower level of training. In practice, the methods that have been least demanding of formal education or training have often been the most successful.

D. Manpower Policy

Manpower development and employment are two closely interrelated aspects of the overall problem of labor use. Whereas employment policy is primarily aimed at adjusting the number of jobs to fit the number and skills of workers, manpower policy is directed towards preparing people to fit the pattern of jobs. Thus manpower policy deals with education and training, but also with the process of matching up jobs with people able and willing to do them. This matching involves various forms of public information about future job prospects, so that people will direct their job preparation toward fields where jobs will be available, and also involves reductions in barriers that prevent people from moving into the jobs that are or will be available.

As discussed above effective manpower planning must consider people's willingness to do a job as well as their ability to do it. Job training will fail if it tries to train people for jobs they are unwilling to take. Manpower planning must assure that those who are going to be able to do a job will be willing to do it as well.

One of the paradoxes of education and training is that selection of subjects taught is usually left to the student in formal education but has been done by officials for training. This has often been unsuccessful in that the subjects students have selected in formal education have often been ones for which there were few job prospects. At the same time training has often been unsuccessful because trainees were not consulted on the subjects to be taught.

This is not, however, as strange as it seems. Most training is for skills. The goal of the trainee is to obtain the skill and so the trainee is the best judge of what skill he or she wants to learn and will use. In education, however, the particular skills are often, even usually, not of primary importance to the student. The student first decides to get an education and <u>then</u> decides what to study. The particular subject is often a means to an end and is selected to make completing school easier or more enjoyable rather than because the subject is important. Unfortunately, the subjects selected are often not the ones the country has a great need for.

This doesn't necessarily mean that students should be told what subject to take. It does mean that if unemployment of the educated is to be avoided, more guidance to students and schools will be necessary. In skill training, however, more guidance from the potential trainees is called for. The latter point is covered in the Extension chapter.

Education and training are the core of most manpower policy. If these are to prepare students for present or future jobs, both training institutions and students must have guidance on what jobs are or will be available and what skills these jobs will demand. Such guidance will be possible only if manpower planning is developed and used to guide educational and training policy.

Manpower planning must begin with a survey and projection of both current and long term needs. Because of the long lead times for training, manpower planning inevitably requires a long term perspective. (152, pp. 11-12; 410, p. 77) The types of skills that will be needed will also depend on the needs that are established by agricultural development plans and forms of organization so these two types of planning must be closely coordinated. (See the above section on Training, Organization and Technology Trade-Offs.) (434, p. 11) The Ministries of Agriculture and Education should work closely together on issues of technical and rural education. (280, p. X5)

The manpower needs estimated by the planners must be communicated to both training institutions and the public. It is the training institutions which must adjust the training that they provide to assure a better balance between technical subjects and humanities. (280, p. X5) But perhaps even more important, it is the workers and students who must become aware of what jobs are available and will be available in the future. The unfortunate problem of having technical manpower shortages at the same time that there are large numbers of educated unemployed can be solved only by convincing students that future jobs will lie in technical and managerial fields. Information about opportunities may also play a role in training for unskilled work.

Attracting students to study technical fields is not enough, however. If students are to fill the manpower needs for which they are being trained, their training must be appropriate to the conditions under which they will work. Too often foreign training, and even academic training in developing countries, qualifies students for working in conditions that do not exist in their countries. Although this is not the only reason, it is certainly a contributing factor in leading 30,000 foreign engineers over a 20-year period to remain in the United States after their training. (387, p. 32)

If manpower development is to succeed it must prepare the manpower to work in the conditions of the developing country. This means that preference should be given to training given in the country rather than abroad. (331, p. 158) Where training is to prepare people, either outsiders or locals, to live and work in rural areas, the training should be given in rural areas. (399, pp. 216-217) Even if outside training is superior academically, local training will compensate for this whenever it keeps a student at home who would otherwise leave for good or where it relates academic work to local problems. If the government must send a trainee abroad, it should consider countries or regions with conditions similar to those in the area where the trainee will work. For overseas training, this will often mean sending trainees to another developing country or international institute such as IRRI or CYMMIT rather than to a developed country.

Giving preference to local training does not mean all training should be local. Specialists must be trained where there are training programs. For most trainees, however, it seems best to train them in the environment where they will work. (331, p. 158) Those who later need a specific type of advanced training can be sent abroad later to get it. (233, pp. 29-30)

XV. CONSULTANCY SERVICES

A. The Need for Consultancy Services

The process of economic and social change in developing countries calls for the application of a wide range of skills. Yet developing countries have too few trained people to undertake programs at the scale required for sustained development. To aid in finding solutions to their problems, developing countries have called on consultants from a variety of public and private sources. The volume of consultancy services provided has increased substantially over the last decade, and is projected to increase still more in the near future.

Consultancy is rooted in the need not merely to provide, but to transfer, scarce skills. This is true whether the consultant is providing services to a firm in an industrially developed country, or to an agricultural organization in a developing country. Several reasons have been given for the use of consultants. These include obtaining specialized skills and knowledge; conserving funds by having a highly skilled person on the payroll for a relatively short time; obtaining independent evaluations and recommendations; and, finding or developing fresh approaches to the solution of problems. (435, pp. 2-3; 436, p. v) These reasons are important, but one principle underlies them all. This is, that to be successful, a consultancy requires a change in the client's perception of his problem, and an increased ability to deal with it. (437, p. 7)

The concept of technical assistance, from which modern consultancy services have developed, has changed considerably during the last thirty years. During the first stage of technical assistance, it was assumed that most or all of the practices which had been effective in technologically-advanced nations could be transferred, without basically being changed, to all socioeconomic and cultural settings. By about 1950, aid donors became more aware that there are significant social and cultural differences between countries. The acceptance of change, it was learned, depended greatly on many factors, including the cultural, social and psychological beliefs and practices of each country. These practices, therefore, must be considered in providing technical assistance in a form which can be effectively used. This knowledge has led to improvements in the way technical assistance is delivered, but it is still not entirely adequate, because some critical considerations are omitted.

It is necessary, for example, to analyze the structures and methods of the organizations to which consultancy services are provided. Such services rarely, if ever, are provided directly from

consultants to farmers. Rather, they are provided from one organization to another, and then channelled to farmers by direct or indirect means. (438, p. 10) The structures and methods of the organizations, especially those of the recipient organizations in developing countries, directly affect the advice and services offered and do much to determine whether they will be received and effectively used. Because the essence of consultancy is the transfer of skills, the measure of the consultant's success is not ultimately his ability to identify and solve problems, although that is very important, but the extent to which this ability is transferred to and put into practice by managers and technicians of the developing countries. (439, p. 25)

B. Reasons for Using Consultants

Agricultural managers may want to consider using consultants for a number of reasons. Consultants provide a readily available source of knowledge, experience, and skills not usually found in a client organization. It is, of course, virtually impossible for any one organization to maintain a staff which is so large and highly specialized that it can find appropriate approaches or solutions to all problems on a flexible basis. Consultants have often been able to use their specialized capabilities to accelerate the application of technical, economic, and managerial skills to the solution of problems. (435, p. 2) Further, a consultant who serves many clients works frequently with situations that may confront a client organization only rarely. From this broad exposure, consultants often learn what problems to anticipate and what actions are likely to pay off when obstacles are faced. (436, p. 17)

Another factor to consider is the relative objectivity offered by consultants. Because of their comparatively independent position, consultants can often evaluate a proposed activity or plan in a way which would be difficult if not impossible for an employee of the organization. (436, p. 17) Such an impartial viewpoint, free of pre-set lines of commitment, may in itself be a valuable service in an organization in which personal interests and traditional viewpoints are limiting factors in the attempt to define key problems and find solutions. Further, consultants have at times been able to express ideas which, though unpopular, were pertinent and useful. Regular employees might be loath to express such ideas, or might be ignored if they did express them. (440, pp. 3, 4)

Another reason frequently given for using consultants is that their use is necessary to secure donor funds. In some cases this is true. The World Bank, for example, has required the use of consultants for project appraisal, and consultants have been chosen and employed by borrowing countries with Bank approval. (441, p. 3) The granting of Bank loans may depend in part on consultants' feasibility reports. In other cases, there may be strongly-held feelings by people in developing countries that proposals prepared by expatriates are more likely to receive funds. African nationals have cited this feeling as a reason for their low degree of participation in project preparation. Because Africans sometimes regard foreigners

as guests in their countries, and African customs frequently forbid criticism of guests, proposals prepared by consultants have at times been accepted without open criticism, but without deep conviction or support for the project by the Africans. (442, p. 34) Similar feelings have been noted elsewhere. Thai officials have been quoted as saying, "If we do not agree with his (the adivsor's) ideas, we do not get the money." (440, p. 7)

C. Effective Use of Consultants

In theory, using consultants to assist in such areas as sector analysis, feasibility studies, and organizational analysis should result in more effective operations. However, the use of consultants provides no guarantee of improved results. To increase the chances of improving operations through the use of consultants, the client must first answer the question, "What is the purpose of this consultancy?" To answer this well, the client organization will have to define its problems as clearly as possible and assess the means available for solving them. This process of self-analysis by the client organization has often been beneficial because it requires the client to attempt to specify work objectives, time and cost requirements, and the final product expected from the consultant. Deciding on objectives is the client's responsibility, not the consultant's, although consultants may be able to clarify choices for clients. (443, p. 98)

It is rare that either a client or consultant can foresee exactly what problems a consultant should assist with. Neither is it likely that a work plan which is formulated initially will remain unchanged as a project unfolds. It is therefore important to realize that the original objective may need to be changed in light of subsequent developments. As both the client and consultant learn more about the nature of the problem with which they are dealing, the nature of the consultant's tasks and work plans often require change. It is therefore important to build into a contract or work scope provision to review and modify the terms of reference, if necessary, during the life of the contract. (444, p. 3)

At times, the client may be aware that he is unable to define the terms of reference to his own or to the donor's satisfaction. In such cases, it may be in the client's interest to retain a consultant to help clarify the problem by preparing a preliminary report or prospectus. (435, p. 13)

In theory, it is said that a client should decide exactly what he wants to achieve before inviting in a consultant. These wants should be stated in terms of cost, productivity, delivery time, or other measurable criteria. Otherwise, the basis for judging a consultant's activities may be lacking, and it will be more difficult to attain a desired objective. (443, p. 98) In practice, it is not often that the client will be able to define his problems with a high degree of precision. The client more often will state his expectations and objectives in somewhat general terms, and an early task of the consultant will be to work with the client to develop an appropriate approach and work program. (437, pp. 10-11) On this base, realistic terms of reference can be established.

While the terms of reference cannot be complete in every detail, if possible, they should include a statement of the background of the problem; the scope of work, with room for modification; a list of services required; a list of available information, including primary contacts; studies previously carried out; the necessary field surveys; and the responsible organizational element which will monitor the undertaking. (435, p. 13)

Terms of reference, and especially scopes of work, are often deficient because an inventory of background information has not been assembled. This may mean that a study can be well under way before there is real agreement between a client and consultant as to what is required and how it can be accomplished. (444, p. 3) This problem re-emphasizes the need for close continuing working relations between consultant and client. Experience shows that one pattern which has proven successful is to form an early, tentative approach to a problem, revising this approach as more data becomes available. Forming and reforming alternative approaches and testing them in periodic meetings between client and consultant will eventually produce a solution or approach which satisfactorily passes all tests. (437, p. 7) One consultant, using a variation of this approach, developed a tentative approach to solving a problem, charted the major activities involved, and posted the chart in an obvious place. As the various people and organizations involved in the project saw and analyzed the proposed plan, they suggested refinements and improvements, and became actively involved in developing a better solution.

The way in which clients phrase their instructions to consultants is also important. Even if a very good scope of work exists, a continuing dialogue between client and consultant is necessary. Consultants have noted the implications of the following instructions from clients: (443, p. 94)

(a) "Tell us what's wrong with us." By phrasing instructions in this manner, the client puts himself in a subordinate position. Further, the client who says this may be indicating that he will not take part in deciding what is wrong, so he may feel he has no responsibility for implementing recommended solutions. A client who excludes himself from the process of analysis to determine both "what's wrong," as well as, "what's right" has already begun to limit the possibilities for transferring skill from the consultant to the organization. Another consideration about this instruction is that the leadership of the client organization may really be asking what is wrong with all of the organization excluding the leaders. Relatively few administrators feel that they should be studied, assuming that most problems exist at other levels within the organization, or outside the organization altogether. Yet bureaucracies and their personnel are a vital element in the delivery system and all levels of their operation must be taken into account. (438, p. 29)

(b) "Write us a report and recommend this..." It is not uncommon for a consultant to be called on to provide support for a conclusion which the client has already reached. Unless the facts, as they are discovered by both the client and consultant, call for the requested conclusion, this instruction would subvert the proper role of both the client and consultant. Moreover, if the conclusion has already been reached before the consultancy begins, the facts that are sought may reveal only one side of the picture. A report based on such facts could possibly help an organization in the short run, but more often hides the real problems that exist. (443)

(c) "Do something for us." This instruction assumes that a proper role for a consultant is to perform the work for the client, in lieu of the client doing it for himself. This procedure is evident in the filling of government positions with expatriates. Lacking enough people who have the necessary skills, developing countries have often used expatriates to meet immediate technical and management requirements. (445, p. 4) In some cases, this has been at the advice and with the support of donor organizations. The U.S. Agency for International Development has provided for private U.S. organizations to recruit Operational Experts (OPEX) to fill governmental positions in a number of African countries. The World Bank, in sector reports for several countries, has emphasized the shortage of qualified personnel and the long time that will be required to build up indigenous organizations. The Bank has recommended on several occasions that, as an interim measure, countries consider employing outside (expatriate) assistance on a fairly large scale to staff both federal and state ministries. Most often, for Bank funded activities, experts have been recommended in the areas of project planning, preparation, and implementation, and to provide training. Virtually every donor organization recommends training counterparts to replace expatriates as quickly as possible. The Inter-American Development Bank has stated that, "The external consultants should not be permanent. Their assistance should only be given until the country has prepared its own executing personnel and no longer needs external assistance..." (394, p. 238) The World Bank stresses that it is important that training of suitable counterparts be undertaken both locally and overseas as an integral part of programs using expatriates. Uma Lele, in her report on rural development in Africa, recommends that expatriate assistance in projects can be most effective not mainly for project management but to assist in training African manpower and in developing local, regional, and national institutions to be capable of preparing projects and making them viable.

While there is wide agreement that expatriate assistance should be as short term as possible, and that counterpart training should be an integral factor, practice varies. The Israeli technical assistance program relies on a team approach rather than the use of individual experts to carry out concurrent training and demonstration programs, with early replacement by local counterparts. (446, p. 20) In many cases, however, it has proven difficult to assign suitable counterparts. A former consultant to the Government of Kenya observed that in the vast majority of instances where expatriates

worked in the public sector in Kenya, no counterpart personnel were provided. In many cases when counterparts were assigned, there was no program for transferring the necessary skills to them. (445, p. 3) In contrast, this same consultant relates that in Tanzania every expatriate had a counterpart. Further, some expatriates were working for Tanzanians who had once been assigned as their counterparts. However, even in Tanzania there were no formal programs to allow for skill transferral. (445, p. 5)

OPEX and similar procedures are attractive because they allow for critical shortages to be quickly filled by skilled personnel. There is real doubt, however, that this fulfills the principle of skill transferral necessary for development, even though its appeal to many clients has proven to be powerful.1/ It has created at times a condition of dependence, rather than build the abilities of developing countries' organizations. When consultants leave, for whatever reason, vacuums are created. Expatriates should be used only in the most pressing situations, and should be replaced by nationals as soon as possible.

(d) "Teach us how to do something." This is a more positive approach, because it concentrates on the transfer of skills. (443, pp. 95-96) Even so, it is incomplete, because it assumes a one-way flow of information and skills from consultant to client. At the extreme, the client is seen as an empty vessel, to be "filled" from a consultant's vast store of knowledge. The Brazilian educator Paulo Freire calls this "the banking concept" in which knowledge is seen as a gift bestowed by those who consider themselves knowledgeable upon those who lack knowledge. (404, pp. 57-60) Freire's approach, based on extensive teaching of rural peasants, holds that people must teach each other, and thereby become jointly responsible for a system in which all concerned are able to grow. This is a basic factor in any development activity and is fully applicable to the client-consultant relationship. (404, p. 67) From the outset, and at each stage, the client and consultant must be joined in a partnership for learning and getting things done. Experience shows that it has not generally proven productive for consultants to be hired and then left on their own. Rather, policy guidance must be provided and emerging issues explored together. (444, p. 5) Answers must be tested all along the line with the full cooperation and participation of the client. (439, p. 25) In this way, a final report will emerge which will be a formal agreement and the ratification

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1/ One executive reports of a consultant who worked for him: "That's one of the things I like about Smith. He doesn't just drop a report in our lap; he participates in the action right along with us and sees things through. As a matter of fact, during negotiations he takes over and has us working for him -- which is the way it ought to be." (443, p. 96)

of a process that has been formulated jointly. The client will then "own" the report, and will implement his own recommendations instead of those of an outsider. (447, p. 69)

The process of learning together involves more than merely a flow of information. The problem of the client may not be a lack of information, although information is vital to action. But what is needed is the conversion of information into constructive, purposeful and effective activity. Thus, consulting is directly linked to training, and to the creation of sets of tasks which client personnel can carry out to achieve specific organizational results. (443, p. 91) By the creation and repeated application of such tasks there will be a transferral of skills from the consultant, which will lead directly to a change in the client's ability to solve problems independently. (443, p. 92)

The expectations of both clients and consultants should be tempered by a degree of modesty. In most cases, it will take some time for a client and consultant to work effectively together. There may be many occasions when a consultant will be tempted to do the job himself, because he already knows how and can do it more quickly. This must be resisted. One way to face this problem is to begin each consulting assignment at the point where the client is capable and willing to begin. The overall project must be analyzed to determine where initial inputs will yield the best results with the resources (time, people, funds, commodities) that are available. If the work is beyond what the client is ready to tackle, or if the changes recommended pose too great a risk for line managers, the chance of failure and frustration may be high. Consultant and client together must develop an approach which will yield early successes, thus laying a base for more advanced activities. (447, p. 67) Experience indicates that the design of the work program should be such that efforts will expand to build on early successes, with the pace keyed to what the client can incorporate and use. (447, p. 70)

D. Areas for the Use of Consultants

Consultants have been used in virtually every area of development work, and they have exerted vast influence in sector and policy studies, governmental reorganizations, major capital investments, tax changes, land reform and many other areas. (444, p. 2) Generally, there are four major areas in which consultants work, each of which has implications for client governments and organizations. These areas are: policy studies; plan, sector and project analysis; management (including reorganization and training); and, improvement of functional operating units at all levels. (437; 444; 436)

In each of these areas, it is the responsibility of the consultant to help the client explore alternatives and the consequences of each alternative. It is the responsibility of the client to make final choices and to implement those choices. This is especially important in broad gauge areas such as policy, plan, sector and reorganization studies.

One problem often mentioned in each of these areas is that consultant's reports may be so general that they merely provide enough facts to confirm prevailing opinions or lay the basis for further studies. Clients usually need more than this. They want specific recommendations for shaping policies; projects that are identified and compared with alternative investment possibilities and reorganization plans whose projected effects are assessed. (444, p. 4) Again, what is desired of the consultant should be clearly expressed, so that -- unless it is desired -- a general overview report does not result from months of work.

In policy studies where high level advice is sought, the decision-makers must be available to the consultant. In some cases, consultants have been asked for policy advice, yet they have been put into working contact with committees or subordinates who had neither the information nor the authority to act at the level where the problem existed. If the consultant's findings are likely to have political implications which would affect implementation, the consultant should be informed that this is a constraint within which alternatives must be studied. A technical report which for political reasons cannot be implemented has limited utility at best. (444, p. 5)

Theorists advise that, when undertaking reorganization studies, people throughout the organization should be consulted about the effects of possible changes. In reality, the degree to which people at all levels of an organization can be involved in the early stages of a reorganization study is limited. The spread of rumors based on incomplete information, especially at the middle and lower working levels, can be very unsettling. At the point that a few good alternatives have been chosen and developed, it is a good idea to check their possible effects with selected people from different levels. The criticism has been raised in some African countries that consultant contacts have been too exclusively with top level client staff members. Middle level personnel can contribute a great deal, at the proper time, because of direct, first-hand knowledge they have of operational problems. (448, pp. 11-12) When gathering information from middle and lower-level personnel, questions and explanations should deal with the way in which people at those levels will be able to work effectively with, and be affected by, alternative structures and processes.

Management consultants, as opposed to substantive technical specialists, have generally been used for three kinds of assignments, to work with clients on:

(a) Major policy questions where the organization must rethink its assumptions and convictions about both objectives and means. Strategy developments, diversification, and long range planning are typical areas.

(b) Politically sensitive problems where the internal organization has vested interests and substantial differences in perspective

or philosophy. Organization rearrangements and overhead reduction policies are characteristically of this type.

(c) Fact finding-analytical evaluation situations where considerable research and analysis is required into complex situations using specialized techniques and concepts. (437, p. 2)

In implementation activities, there are two major possibilities: First, those in which definition of specific objectives and a discussion of alternative methods is necessary; and secondly, those activities in which the problem and objectives are clearly defined. In the first, it is more likely that management consultancy is desirable. In the second, an expert in the appropriate technique may be sufficient. (437, p. 3)

E. Obtaining Consultancy Services

1. Sources

Consultancy services have usually been thought of as the flow of technical knowledge and personnel from technologically advanced countries to the developing countries. The major sources of services have been either private organizations, multi-lateral, or bilateral governmental entities. More recently, there has been a small but increasing amount of consultancy services among the developing countries, and to a lesser extent, within countries. (446, p. 17) A number of developing countries now have the capability to export some of their resources. For example, Taiwan can offer expertise in rice farming and family planning; Israel has superior capabilities in arid zone research, regional planning and social services; Singapore has had successes in low cost public housing and family planning; and the Philippines excel in some aspects of tropical agriculture. (446, pp. 17-18) In some cases, the experience of a consultant providing services from one developing country to another may be more relevant than if a consultant from a developed country is used. Two examples of networks of trained personnel providing such services are the Shalom Clubs which grew out of the Israeli training programs and the Council of Representatives of National Development Foundations fostered by the Pan American Development Foundation. The possibility of using consultants within a country should not be neglected. The World Bank encourages the use of domestic firms when they are qualified, either alone or in combination with foreign firms. (441, p. 3)

Because funds and foreign exchange are often in short supply in developing countries, the question of fees will obviously be of concern in the selection of consultants, although cost is only one of several considerations. The use of a domestic firm in combination with a foreign firm might be considered, as it would serve two purposes. First, total cost to the client can be reduced, and secondly, if the project is properly designed, some skill transfer from the foreign to the domestically based consultant -- as well as to the client -- will take place. Since the availability of local skilled consultants is likely to be a problem for some time, the

base of such consultants should be expanded when possible. For instance, the UNDP has observed the need for an effective, economically viable, indigenous management consulting system for Latin America and has recommended that international management consulting specialists should be called on to help develop such a capability in Latin American public and private institutions. (436, p. 3)

2. Methods of Obtaining Services

The sequence of actions leading to retaining a consultant normally include most of the following steps:

a. Recognition that a problem exists which calls for a consultant;
b. Appointment of a coordinator or committee;
c. Explanation of the issue and definition of the problem;
d. Preparation of a list of prospective consultants;
e. Preliminary contact and screening;
f. Call for bids (tenders) or request for proposals;
g. Selection of a consultant;
h. Negotiation and concluding the agreement.

Each of these steps will be discussed.1/

a. Recognition that a Problem Exists which Calls for a Consultant

It may seem obvious that an organization would realize when consultancy services are needed. In fact, organizations faced with problems which consultancy might help to solve may be hesitant to seek help. This could be because the nature of the problem may not be fully understood within the organization; because the organization does not want to admit that a problem exists; or because of previous negative experiences with consultants. In some cases, business will proceed as usual and problems grow in size and intensity, making their solution more difficult when it is finally undertaken. The ability to recognize a problem often relates to the progress reporting systems used. (See Chapter XVI)

1/ All major assistance organizations have established guidelines and regulations as to how consultancy services may be obtained. The United Nations has published the Manual on the Use of Consultants in Developing Countries (435); The World Bank has "Uses of Consultants by The World Bank and Its Borrowers" (441); the U.S. Agency for International Development sets forth its policies and procedures in a series of manual orders; and the Inter-American Development Bank has publications on "Guidelines for Procurement under IDB Loans" and "Uses of Consulting Firms by the Inter-American Development Bank and its Borrowers." The sequence discussed herein attempts to list the major steps of the process which would apply in most cases, realizing that individual projects may require special consideration.

b. Appointment of a Coordinator or Committee

The function of the coordinator or committee is the preparation and carrying out of all subsequent steps necessary to secure a consultant once a problem has been identified. This will be the focal point within the client organization for contacting and negotiating with consultants and recommending consultants for selection. This job is usually formally assigned to a procurement or contract office. In practice, representatives from technical offices are usually heavily involved because of their knowledge of the functional aspects of the project. Previous experience in dealing with consultants should also be considered in selecting the coordinator or committee

c. Definition of the Problem

Before terms of reference can be drawn up, it is necessary for the client organization, with the leadership of the coordinator or committee discussed above, to examine the problems facing them and to assess the means by which these problems might be solved. At this stage, the statement of the problem and objectives by the client may be rather general, and it may be found that a shorter, preliminary study for clarification of the problem is called for before the major study or consultancy is begun. The additional money and time spent on a preliminary study is often a good investment, as such studies have often yielded considerable savings by providing a clearer statement of the problem and objectives.

The need for clear terms of reference was discussed in Section C above, along with the need for building into the terms of reference the flexibility to make modifications as new information becomes available.

d. Preparation of a List of Prospective Consultants

The World Bank, regional banks and bilateral assistance organizations advise client organizations to draw up a fairly extensive list of firms claiming expertise in the specific field involved. (441, p. 2) Some developing countries have agencies such as national planning or industrialization boards which maintain a roster of consultants who have been evaluated on their legal and financial status and experience. (435, p. 14)

In practice, some international consulting firms will have heard about the proposed activity and will be in contact with the client on their own. Advertisements in foreign journals and newspapers are also frequently used to solicit prospective consultants' interest. Whatever method or combination of methods is used, it is generally the formal responsibility of the client government to prepare the list of firms or people from which a consultant will be selected. (441, p. 6) However, it is not uncommon for field personnel of international assistance organizations and embassies to offer suggestions about firms they believe to be qualified. The preliminary list which is compiled is likely to have inputs from several sources, both formal and informal.

The preliminary list may be shortened by studying each firm's capabilities and experience, and selecting a few of the best qualified. These firms will be the ones from which those who will receive invitations for proposals will be selected. Some organizations, such as the World Bank, prefer to have borrowers submit to them the list of consultants who will receive invitations for proposals, so that the Bank may be satisfied about the quality of the consultants. (441, p. 3) The Bank indicates approval or disapproval of firms listed, but does not formally make specific nominations or selections. (441, p. 6)

e. Preliminary Contact and Screening1/

The project coordinator or committee at this stage sends a description of the project or study to the consultants selected. It is desirable to obtain more detailed information on the experience and capability of each consultant, including similar projects which they have undertaken, references who may be contacted and their availability for the proposed study or project. When this information is screened, the few organizations which remain are those which will receive requests for proposals.

f. Requests for Proposals or Calls for Tenders

It is in the interest of both the client and the consultant to request proposals from only those firms that appear most qualified. In part, this is because the preparation of proposals by consultants and their review by clients is difficult, time-consuming and expensive. Consultant staff time spent on proposals and related activities may account for over 25 percent of overhead costs -- costs which will eventually be passed on to clients in some fashion. (444, p. 6) One long-time consultant recommends that clients consider a pre-qualification system in which firms would submit a general statement of qualifications which would involve less work than a proposal. A selected limited group of contractors would then be chosen to submit detailed proposals. (444, p. 7)

The request for proposal is the first contact between client and consultant in which the proposed study or project is discussed in detail.

g. Selection of a Consultant

Many client organizations may either prefer, or be required to use, a system of competitive bidding. In some cases this requires a consultant to quote a price at the time a technical proposal is submitted. Cost, although an important factor for a developing country to consider, is not the only thing which must be examined

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1/ This stage is often omitted for less complex projects or in those cases when only a few consultants appear to be qualified.

in selecting a consultant. In recognition of this, such organizations as the World Bank and Asian Development Bank invite unpriced proposals, and the U.S. Agency for International Development often uses a two-envelope system, with technical proposals being considered separately from cost. (449, p. 3) The trend is now toward first considering the proposed technical approach and weighing the cost factor subsequently since the major consideration is attaining the objective of the study or project, which the lowest cost proposal might not accomplish. (435, p. 19) In the two-envelope system, if two firms or consultants appear to be roughly equally qualified, the one offering the lower cost is usually chosen. (444, p. 7) Where a trade-off between quality and price is necessary, this should be explicity understood. A client will need to ask himself: "How much quality am I willing to trade for a specified decrease in cost?" (449, p. 12)

h. Negotiations and Concluding the Agreement

When a client has tentatively selected a consultant on the basis of both how well he thinks the consultant can do the job and the cost involved, client and consultant will begin a process of negotiation and possibly of refining the terms of reference initially set forth. Both the client and the consultant have critical interests to express during this negotiation phase. Some of the factors discussed may never appear in a formal agreement, but they can be critical to the success of the study or project. These factors include functions and training of counterpart personnel, logistical and administrative support, type and frequency of meetings and reports which will be used to measure progress as the project unfolds, and the end results expected by the client, expressed in operational terms.

F. Need to Identify the Monitoring Office

Consultants are often financed by one organization (e.g., IBRD; USAID; FAO) to work for another organization, such as the ministry of agriculture, in the cooperating country. In complex studies or projects, several ministries and donor organizations may be involved. In either event, it is essential for the parties involved to recognize any conflicting or different objectives they hold, and to agree to a working policy. Otherwise time will be lost and any final reports or end products may be rejected by the financing organization, the host government, or both. (444, p. 6) To avoid such problems, the terms of reference should specify the monitoring office and the lines of authority which will determine the consultant's work and reporting arrangements.

In most cases, both the donor and client organizations will expect the consultant to produce actionable recommendations. This is more likely to happen if the monitoring office is high enough in the organization to implement the recommendations, or to assign implementation responsibility to others. In complex projects involving more than one ministry, however, no single monitoring office may have the authority to implement recommendations. A common way

of dealing with this problem has been to use interministerial committees to effect implementation. Another approach has been to use the overall planning agency as the "referee between claimant sectors." (444, p. 6) There is no way to stipulate in advance which approach would be better in a specific situation, and the client organization should consider both possibilities.

G. The Client - Consultant Partnership

Once an agreement has been entered into between a client and a consultant, it is tempting for the consultant to set out to "get the job done." As discussed in Section C above, this must be resisted, because experience shows that when clients participate in developing solutions to problems, two major benefits result. First, skills are transmitted, and second, the solutions are much more likely to be implemented. (447, pp. 67-70)

There are several practical ways by which skills can be transmitted. One is to use counterpart personnel. "Counterpart" is the term that has been most widely used to identify developing country personnel who have been assigned to work directly with technical advisors from foreign assistance organizations or private foreign firms. Some dissatisfaction has been expressed with the terms "advisor" and "counterpart." The terms imply equal status in one sense, but in practice the counterpart is more often a very junior partner, sometimes even directly supervised by the advisor. The image one has of his role influences strongly what he does and how he does it. The advisor-counterpart relationship should be examined in light of the objectives of transferring skills and enabling clients to perform increasingly more complex tasks independently.

What is necessary is for both consultant and client to see their roles as mutually instructive -- the bringing to bear of separate skills and experiences on areas of joint concern. (448, p. 4) The consultant brings technical expertise and broad experience with problems similar to those faced by the client. The client brings detailed knowledge of local operations; the cultural, social, political and psychological environment and what is likely to work or not work there as well as something not often stressed: continuity. Neither the client nor the consultant can make the project work effectively without the cooperation of the other. What specific steps might be taken to futher cooperation in the process of joint actions by clients and consultants?

Training is an essential part of consultancy, yet arrangements for counterpart training are usually defined loosely, if at all, in contracts. More often, the approach and content of training of client personnel are left to individual consultants. Few consultant organizations have established policies for training client personnel.1/

1/ This may not be true for a project that has training as its major objective. Many projects, however, have small training components, or in some cases none at all.

One can find, on the same project, consultant personnel who provide excellent training, and others who provide none. The consultant's time spent on the project overseas is often short. He wants to launch activities promptly. In many cases, this seems to conflict with the process of promoting growth of client personnel through what is often in practice a trial and error process. (440, p. 6)

Consultants require capable client counterparts to work with, but skilled client personnel are scarce, and unlikely to be assigned to fulltime counterpart tasks. Junior staff members who are assigned, often lack skill and the authority necessary to move the project along successfully once the consultant has departed. (444, p. 5) To resolve this problem, the consultant must work with the counterpart in a phased series of tasks which will result in much of the work actually being performed by the counterpart. This involves every phase from objectives-setting for specific tasks through implementation and reporting. The tasks undertaken by counterparts must begin at the level of which they are capable and be increasingly challenging throughout the project. (447, p. 67) The consultant cannot impose objectives, but can direct attention to new concepts and methods which are most likely to yield answers to the problems being worked on. Whenever possible, counterparts' successful accomplishments should be brought to the attention of their superiors. The transfer of skills is most complete when it is both actual and perceived. (439, p. 25)

The client has the responsibility to make available the best personnel possible. To do less will perpetuate a condition in which foreign consultants do the work, with the result that skill transfer, and thus real development, is negligible. Consultant reports indicate that counterparts sometimes show little interest in their work with the consultant. In part, this results from assigning very junior people as counterparts. Another factor appears to be the fairly menial tasks the counterparts are often assigned. A further reason is that neither client governments nor consultants have understood well the potential for training which consultancy assignments offer. When both the client and consultant recognize that they are jointly responsible for the results of projects and studies, consultancy can become a learning and doing partnership.

XVI. MONITORING, REPORTING AND CONTROL

A. Definitions and Examples

In May, 1973, a project began to be implemented in the Philippines to provide a Management Information System (MIS) for the Masagana 99 Program. The project was a joint effort of the National Food and Agricultural Council (NFAC), the Bureau of Agricultural Economics (BAECON) and U.S.A.I.D. The MIS was designed to help management determine the necessary inputs for the Program, and to identify when those inputs would be required. (498, p. 4)

A working group made up of members of the three organizations (NFAC/BAECON/USAID) first designed a simplified manual system for use in short range implementation in 43 provinces. Up to the time of the installation of the MIS, NFAC, which had primary responsibility for the Masagana 99 Program, used a monthly report form which was generally an incomplete historical summary that did not serve well management needs for program control and programming. The format was not well structured, the content was inadequate, and it arrived too late for meaningful action to be based on it. Its deficiencies reportedly ran literally from A to Z, as noted on the following page.1/ (499, pp. 10, 11)

The Masagana 99 Program has been largely successful in increasing rice production in the Philippines -- so much so that the requirements imposed on the MIS have been magnified, requiring rather continuous changes which would allow problems not only to be identified, but to be followed up on so that they do not recur. Current reports on project status indicate a considerable degree of success for the MIS, and while it should be expected that minor difficulties will continue to surface, it appears that the major problems in developing and installing the System have been dealt with.

The problems noted on page XVI-2, while diverse and difficult, are common to programs and projects wherever they are undertaken. In any program or project, there are unplanned changes. Some of these changes may be beneficial; others harmful. In Kenya, an ex-post review of a small farmer credit program revealed that the

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1/ The authors wish to thank Kenneth F. Smith, USAID Management Systems Advisor, Manila, for the series of reports produced while the Masagana 99 MIS was being implemented.

FIGURE 1

Problems Noted in the NFAC Reporting System Before M-99 MIS

a. Key statistical indicators not identified or highlighted
b. Targets set by Central Office and assigned to provinces
c. Targets revised continually during program implementation
d. Data requirements too voluminous
e. Excessive detail forwarded by provinces to central office
f. Several organizations originating (collecting and/or estimating) similar raw data, uncoordinated.
g. Intermediate manipulation of data (sub-totals, totals, averages, percentages) requested from provinces by central office
h. System for data flow not clearly detailed
i. No penalty for failing to comply with reporting requirements
j. Some incentives exist to report inflated/inaccurate data
k. Inaccuracies in tabulating data (Mathematical error)
l. Cumulative and periodic data sometimes combined inaccurately
m. Many "accomplishments" items reported are of little or no significance for management purposes
n. Some report formats are overstructured, some understructured and "open-ended"
o. Workload on field staffs is overburdening -- more time spent reporting than working at functional tasks
p. Requirements for reports administratively overburdening -- many copies, typewritten, too often
q. Frequency of intermediate "partial" reports (with essentially the same data) varies from weekly to monthly
r. Provincial reports often sent late, or not at all
s. Processing at central office largely consists of summarizing statistics -- little or no analysis of data content
t. Data summaries transcribed to blackboards rather than graphically interpreted
u. No sampling to verify quality of reported data
v. Narrative is random extract and statement of tabular data
w. No continuity from previous reports, long term trends not identified
x. No projections or forecasts made from available data
y. Inaccurate and/or inadequate comparative analysis of performance, with other provinces
z. No routine feedback or follow-up system to inform or take corrective action on situation as reported

(Source: 499, p. 11)

number of loans made had reached only 40 percent of the number that had been projected, although the total amount of loan funds committed equaled the budgeted amount. Traditional pastoralists who were to benefit from small loans seem to have been passed over in favor of established commercial operators who used larger loans for working capital rather than for on-farm improvements. This problem was not detected in time for remedial action. Similar results have been noted in many projects. Clearly, a continuing or periodic monitoring capability needs to be part of projects to help managers to spot and deal with problems and delay points; to learn from successes and mistakes; to replicate successes, and to exploit opportunities for improved performance. (63, p. J15)

Monitoring is part of a system of observation, reporting, and control which responds to the fact that development takes place in an environment of uncertainty which must continuously be taken into account. Programs and projects, no matter how well planned and rational, are implemented in this uncertain environment, and it is the task of management to translate the plans into reality. One task of planning is to establish milestones and to determine outputs against which progress will later be measured. One task of monitoring is to assess how much progress has been made toward accomplishing planned outputs, and to identify problems in moving on to achieve those outputs.

Monitoring is only one step in the direction of getting needed changes during project and program implementation. It is not sufficient in itself, since observation of events in no way guarantees that management action will follow. Yet even though monitoring is only a first step, and despite wide recognition of its importance, reports continue to note that little attention is often given to monitoring agricultural programs and projects. One report states that during implementation of the Lilongwe Land Development Program (LLDP), although 30 percent of costs were incurred on roads and soil conservation, there was no useful information available on construction and maintenance costs for either road or soil conservation components. This is not an uncommon situation. Similar deficiencies were reported for other projects.

In addition to monitoring, a reporting system is essential in order to inform project managers, higher-level officials and others as appropriate of the salient facts that have been observed. In the Masagana 99 MIS, primary data collection is done by provincial agricultural technicians. Each technician summarizes data on a standardized worksheet, which is forwarded to a Provincial Program Officer, who again summarizes the data, with the summary going on to NFAC for aggregation and analysis at the national level. There the data is analyzed and presented in tabular form, with each table dealing with a key statistical indicator. Data from all provinces are compared and rank-ordered, and high and low producing provinces are identified. This allows for the possibility of dealing in a special way with both the most serious problems and the most outstanding successes. (499, p. 12)

Control results from management decisions to move a program or project in a desired direction during implementation, and the addition of control processes to monitoring and reporting closes a loop which makes corrective or additional action possible. Control includes management decision-making based on data provided by monitoring and reporting, as well as an interrelated set of factors which includes motivation, sub-objectives setting, scheduling, participation, replanning, budgeting, and accounting. While several theorists exclude some of these practices from control, in practice each of them has been used successfully as a control mechanism or process.1/

It was observed in chapter 11, "Projects," that programs and projects differ in some important respects. Projects are normally one-time efforts designed to deal with problems that often require innovation, rapid response, and cohesive structuring of personnel to do what is necessary to meet project objectives. In practice, it has been necessary to design special means of handling the requirements for project monitoring, reporting and control because the approaches and techniques used in more routine, ongoing programs simply proved to be inadequate. Programs, however, nearly always have from one to many projects as major components, and individual projects often form the basis for ongoing programs. There are thus links between programs and projects which make continuity between separate reporting systems highly desirable. A discussion of project needs will be followed by some approaches to multiproject and program monitoring, reporting, and control.

B. Project Monitoring

Monitoring is carried out to provide the project manager, other members of the project team, higher-level personnel, people in supporting organizations, and in many cases project participants, with interim reports during implementation on progress being made toward meeting planned objectives. The more clearly the objectives of the project have been stated, the more precise the measurement of progress can be, as long as objectives remain constant. Project design systems such as U.S.A.I.D.'s Logical Framework thus emphasize the relationship of both the elements within the scope of the project (inputs and outputs) and factors outside the project which will influence project outcome (assumptions regarding project environment, sectoral and higher-level events), with an eye toward progress

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1/ There is no agreed on definition of control. Radosevich defines control as "...an almost continuous function of project management which identifies events in the implementation process that are of special importance to management." He adds that "control compares progress and accomplishments with interim targets and standards while the project activities are executed." (500, pp. 1, 3) Herein, monitoring, reporting, and management decision to bring about corrective or supplementary action are separately described.

evaluation. (501, chapter 2) However, the Logical Framework is drawn up before implementation takes place, and does not always include current field-level data. By itself it does not in most cases, nor was it intended to, serve as a sufficient means of project monitoring.

The Logical Framework has been used by AID in projects which it helped support since 1968. More recently, additional techniques have been adopted by AID to supplement the Logical Framework and serve as a better guide for monitoring specific project activities. These include the Project Performance Tracking System (PPT) and the designation of Critical Performance Indicators (CPI's). These techniques (PPT and CPI) are variations on the more widely used PERT and CPM scheduling approaches, with slight modifications to meet AID's requirements. CPI's, for example, are similar to those activities which fall on the Critical Path of a project, that is, those activities which form the longest chain of activities necessary to complete the project. One difference is that under the AID system, "critical" indicators also seems to include activities not on the critical path, but otherwise of great importance in completing the project. As noted in the AID Handbook #3, performance indicators "could be described as 'strategic control points where performance can be measured.'" (501, p. 3G3) Project personnel with an understanding of PERT/CPM should have no difficulty in becoming familiar with the AID approach if they should be working on AID-supported projects in their country.1/ The AID system is in fact somewhat simpler than PERT/CPM, especially if a PERT/Cost approach or PERT with three time estimates is used to denote most likely, optimistic, and pessimistic activity completion dates.

Such techniques as PERT/CPM have been in use a long time and have aided in project monitoring and reporting in many projects, both in complex, advanced projects and in smaller scale activities involving as few as fifteen or twenty activities. They have the virtue of being fairly simple, and can be learned in a few days. For local-level projects in which a high degree of involvement by farmers, peasants, and people with little experience in the use of such techniques, however, these may be too complex. The monitoring system chosen should fit the overall needs of the project, and in some cases more simple means have been chosen. One such approach was used with a good degree of success in Kenya's Special Rural Development Program (SRDP).

1/ See Annex E for an explanation of the use of project scheduling using PERT/CPM. See 501, chapter 3, for AID's "Instructions for Preparation of Project Performance Network Chart."

The Programming and Implementation System (PIM) was developed for the SRDP through the cooperative efforts of the Institute for Development of Sussex University, the University of Nairobi, and the Government of Kenya.1/ PIM was developed because area plans were not being effectively formulated and implemented in Kenya. PIM became a procedurally based attempt to decentralize planning and plan implementation and to deal specifically with several recurring problems: authoritarian management, wasteful meetings, excessive reports, departmentalism, top-down targetry, inadequate resources, and ineffective work programming. (462, pp. 49-51) One specific element of the approach developed to deal with these problems was a monitoring system. Experience shows that all good monitoring systems form a link between planning and implementation, and PIM is no exception.

The first stage of PIM calls for a meeting at the local level of all parties who will be responsible for carrying out the project. The meetings are chaired by the Area Coordinator, an officer of the Provincial Administration where the project is to be implemented. First, a discussion of the objectives of selected projects is held to re-examine the desirability of the proposed objectives and to assess the potential of the project for achieving them. After this, the main steps in programming are carried out. These are: 1) listing and agreeing to the operations necessary for each project; 2) identifying and agreeing on who is responsible for each operation; 3) scheduling estimated start and completion times for each activity; 4) agreeing on targets and completion indicators for each operation; and, 5) checking for feasibility, agreement on, and acceptance of targets. (462, pp. 44, 45)

There are important principles involved in the way in which the PIM programming exercise is undertaken. First, there is the recognition that planning for project activity cannot be done by a technical planner in isolation from those with responsibility for project implementation. Second, the process involves getting agreement at each stage -- and recording such agreement in writing to minimize assumptions and later disagreements about what was agreed on -- thus setting the stage for coordinated implementation and establishing clearly for everyone what it is that will be monitored to check progress. Implementation and monitoring are made still more likely by agreement on who is responsible for each action and by establishing completion indicators. Far more important that the graphic display technique which is chosen is the interactive analysis in which each responsible organization can assess its role in planning to make the project go well. This built-in multiple checkpoint system makes it far more likely that monitoring will be more effective later on.

1/ PIM is used in program-wide activities involving multiple projects, yet has significance for individual project monitoring needs as well. The project aspects are discussed separately here from the program aspects.

The Annual Programming Exercise is followed by a series of management meetings at monthly or other agreed on intervals. Meetings are attended only by those with implementation responsibilities. The original plans are reviewed in light of actual progress. A color-coded record of progress (///// =on time, ▮▮▮▮=behind time or below target) is kept.1/ This is a built-in monitoring system which has facilitated a "self-policing" approach. Decisions are made about what remedial actions should be taken, and these decisions are implemented (as described in the section on control).

One of the sources which the designers of PIM drew on was the planning and implementation scheme devised and put to use by the Government of Malaysia (then Malaya). Malaya created a Ministry of Rural Development in October, 1959, and a National Rural Development Council in January, 1960. Rural planning through the Ministry and Council came to be symbolized by the Red Book and its associated elements. The Red Book was a standardized plan which was to be executed by state and district rural development committees, which were composed of heads of technical departments, e.g., agriculture, drainage, irrigation, and public works, and also Members of Parliament of respective states.

The Red Book was a large, loose leaf folder about two feet square which contained instructions on project identification and selection. The main part of the Book, however, consisted of twelve sections made up of overlay maps, which included maps on the following:

I. Basic District
II. Land Use
III. Roads
IV. Rural Water Supplies
V. Minor Irrigation Works
VI. River Clearing Proposals
VII. Schools, Health Centers and Playing Fields
VIII. Rural Processing and Marketing Facilities
IX. Rural Industries
X. Cooperatives
XI. Telecommunications Facilities
XII. Rural Electricity (502, p. 146)

Standard instructions for preparing and coding maps and project proposals were inserted in plastic bags attached to each of the twelve sections of the Book. Appendixes provided instructions on conducting committee meetings, instructions for standardized comments on projects, and procedures for informing appropriate officials of the essence of each District Committee (primary action level) meeting. The physical setting for the use of the Red Books was an operations room at the district, state, and national levels. These rooms

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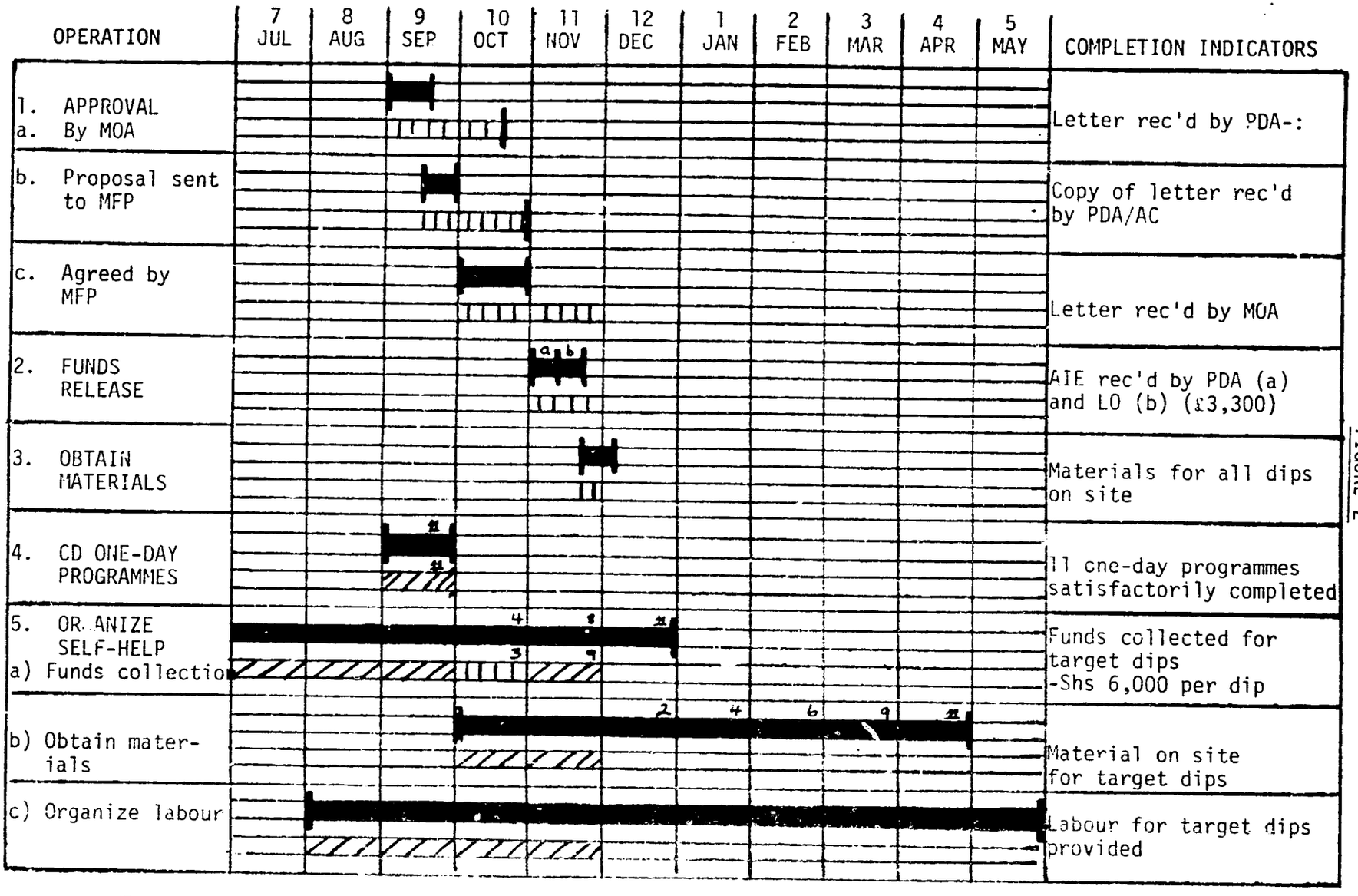
1/ See Figure 2, PIM Annual Programming Chart.

PIM ANNUAL PROGRAMMING CHART PROJECT .....DIPS.....PLANNING AREA...KAGURU.....



Notes: ■ = duration planned at Annual Programming Meeting. Figures above black lines=end of month targets
//// = on time or on target. |||| = behind time or below target.
Chart completed as at end of November 1971. Actual programme continues on a second APC.

FIGURE 2

FIGURE 3

PIM ANNUAL PHASING FORM Financial Year 1971/72

Project: DIPS (11 DIPS) Planning Area: Kaguru

(1) Operation	(2) Officer-(s) resp. for operation	(3) Resources required	(4) Start date	(5) Completion date	(6) Completion indicator (quantify whenever possible)
SECURE APPROVAL FOR PROGRAMME					
By MOA	MOA AC	MOA	1.9.71	15.9.71	Letter received by PDA
Proposal to MFP	MOA	MOA	16.9.71	30.9.71	Copy received by PDA/AC
Approval by MFP	MFP	MFP	1.10.71	31.10.71	Letter received by MOA
RELEASE OF FUNDS					
To PDA	MOA	£3,300	1.11.71	14.11.71	AIE received by PDA (£3,300)
To LO	AC/PDA	£3,300	15.11.71	21.11.71	AIE received by LO
OBTAIN MATERIALS	LO		21.11.71	4.12.71	Material on site
C.D. 1 DAY PROGRAMME	ACDO	C.D. Staff	1.9.71	30.9.72	11 programmes satisfactorily completed
ORGANIZE SELF-HELP	DO	£3,300	1.7.71	31.12.71	Necessary funds for 11 Dips collected (Ss.6000/- per dip)
Funds	ACDO				
Materials	ACDO Dip Committee		1.10.71	30.4.72	Materials for 11 dips on site
Labour	ACDO	C.D. Staff	1.8.71	31.5.72	Labour for 11 dips provided

Notes: 1. See Appendix E for Annual Programming Chart for this project showing progress at the end of November 1971 and Appendix F for the Monthly Management Report for November 1971.

2. The actual APF continues on a second sheet.

were equipped with wall maps showing development projects, and graphs, charts, photographs, and overlays for projects which were in process, those which had been completed, and those which were planned.

Thus, one important aspect of the Malaysian system is that current project status could be checked by examining the Red Book maps. Again, however, this represents only a technique, and while it proved to be an effective approach, it would have meant little without the other elements in the system: the formation of Rural Development Committees at district, state, and national levels, the careful project planning which recognized the need for popular involvement, the participation of both political representatives and technical division chiefs at the state level, and finally, support from the highest political levels. To emphasize his instructions to the committees, the Minister of Rural Development, who was also the Deputy Prime Minister, Tun Abdul Razak, personally visited all of the district operations rooms, frequently arriving unannounced with members of his immediate staff for a briefing on the current development situation and a half-day or full day tour of the area. The District Officer would begin the session by briefing the Deputy Minister, and the respective technical officers for each project area would follow with more detailed accounts. If projects were found to be behind their implementation schedules, the Minister tirelessly sought the reasons why, and issued appropriate orders or took other actions to resolve any problems which could be so dealt with.

The briefings were thorough, but not overdone, as the Minister was careful not to disrupt regular work unduly. However, his objective was to move a bureaucracy to actions which were unusual for it, and he believed that unusual measures were called for. District Officers who were interviewed about the briefings stated that they called for a great deal of hard work, but that they were not arbitrary and that they helped them to do what was required to get the job done.

Like the PIM system, the Malaysian approach recognized the importance of cultural and organizational factors. Monitoring can only be effective if there is an organizational spirit which facilitates the job of implementation rather than one which stifles initiative and threatens or intimidates people in the performance of their duties. The positive side of PIM is evidenced in its decentralization, which allowed implementation targets to be set and operational plans to be drawn up by the people at the operating level who are responsible for project implementation, rather than being drawn up at a central level and dictated downwards. Experience shows that those who are responsible for formulating their own plans play a more effective role in monitoring and policing a project which they "own" by virtue of their role in creating it. The Red Book system, while monitored from the highest levels, also allowed for planning and objectives formulation from people at local levels. Further, the knowledge by operating personnel that genuine interest was felt at high levels, and that action at that level

would be forthcoming to support their efforts, is known to have been a strong inducement to improved performance and to furtherance of their own monitoring efforts.

In spite of these attempts to concentrate on positive factors, however, PIM, the Red Book, and the Masagana 99 MIS have in common with most monitoring approaches a primary focus on monitoring to detect failure. It is well known by practitioners that during project implementation, the frequency of unforeseen delays and bottle-necks is a force to be reckoned with. Investigation of these delays and problems is often undertaken with the intent of fixing blame, sometimes leading involved parties to "pass the buck," make excuses, or to hide or inaccurately report data. (503, p. 84) While it is important to detect and correct failure, it can be equally important to detect successes. Positive feedback is necessary to identify those practices which are working well and to disseminate information about success in order to get a desired spread effect. The fact that more failures are mentioned on monitoring reports may not mean only that there are more mistakes than successes taking place, but also indicates that most people are trained to detect failure and to analyze the implications of targets not met. A review of monitoring procedures in use reveals that few such procedures or systems provide managers a chance to learn about successes in any systematic or sustained way. Such principles as the popular "management by exception," for example, feed information to management on the most significant problems which occur, so that the manager can take action on things which are going wrong.1/ Monitoring based on the principle of detecting problems and correcting them, if this is the only approach being used, can have the effect of preventing recognition of successes. Successes, after all, do not always come by accident, and they may reveal new ways of meeting old objectives, or of creative ways of meeting new objectives not previously envisioned. (504, pp. 1-3)

In addition to the important requirement for monitoring systems -- that they provide information to keep projects on track in achieving agreed on and valid objectives -- two other needs have been identified. These are: 1) that they provide positive feedback on successes to meet current objectives; and, 2) that they provide information about changed conditions which call for re-setting objectives or directing the project in a new direction. This last information is termed feed-forward.2/

1/ As originally conceived, management by exception was to have dealt both with significant problems and successes, but in practice the emphasis has been overwhelmingly on problems.

2/ The authors are indebted to the late Ralph Coverdale, founder of the Coverdale Organization, and to John Waterston, for the concept of feed-forward. The following comments on feed-forward are in part excerpted from 504, by John Waterston.

A feedback system seeks out information about present difficulties and deviations, looking back to past objectives and targets as the fixed standards by which performance is being judged. This information is then used to trigger corrective action to overcome the difficulties.

Both negative and positive feedback have been widely used. The difference in them can be graphically illustrated. In Cameroon, brown rot is a serious disease affecting cacao pods. Plantation planters, given a copper powder from which to make a solution for anti-brown rot spray, were found to know how to use the spray, and in fact two out of three began treatment at the proper time. Research showed (through negative feedback), that various obstacles to full use included the following:

1 planter in 4 did not have treatment equipment,
2 planters in 4 who had the equipment had operating problems,
1 planter in 3 had difficulties in finding the water necessary, bearing in mind the plantation's distance from a water source,
1 planter in 3 had manpower difficulties,
1 planter in 2 received the supplies too late for the time he would like to begin treatments.

A positive feedback approach would also have dealt with those farmers who had applied the copper solution on time and in sufficient quantity to be effective. Belloncle and Gentil report that those farmers who applied the solution on time had to save some packets of powder from the year before because shipments the following spring arrived too late. It follows that if the powder were delivered on time, more planters would use it. A recommendation based on positive feedback would be to deliver sufficient powder to local control and distribution points for two crop seasons. Thereby, the period of application could be lengthened, allaying manpower problems and increasing total effective usage.

In contrast, a system employing feed-forward gathers information about present successes, innovations and new ideas, and looks forward to new objectives and strategies which could be evolved to bring about the widespread adaptation and application of these successes. The main aim of using feed-forward is to insure that a project manager recognizes and then builds on the strengths, successes and constructive ideas already present within his or other projects.

Feed-forward techniques have been successfully used, but have received relatively little publicity. Innovation and technical advance in Japanese agriculture during the last half of the 19th century was often based on methods developed by farmers and spread by the government. Ensuisen, a method of seed selection, was used by farmers in a Kyushu district, then taken up by the chief of an agricultural experimental station and disseminated. Tools such as the

rotary weeder, the treadle thresher, and improved plows were invented by local people and then disseminated. (322, p. 295) The central and prefectural governments played an important part in spreading the use of successful practices. "Agricultural improvement societies" were formed in many prefectures to promote and exchange of successful practices. The Ministry of Agriculture subsequently encouraged all prefectures to establish such societies. Leading farmers were appointed as instructors in some agricultural colleges, and toured Japan to demonstrate improved techniques. (417, p. 61)

Currently, organizations such as the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) devotes considerable attention to disseminating research information throughout Asia through its Agricultural Information Bank for Asia, which to date nine countries are participating in. Such efforts, however, more nearly attain the characteristics of a comprehensive data bank which contains so much data that specific variables may not stand out. A feed-forward system is more problem specific.

Consider, for example, a rural development project with ten units. Two of these are operating successfully, while the remaining eight are not. A feedback project monitoring system would concentrate on the eight units in difficulty; their problems would be examined and the causes analyzed. Then the project manager and his staff would try to suggest ways of overcoming the problems which they uncovered, based on their past experience. In contrast, a feed-forward monitoring system would focus on the two successful units, and analyze in detail the causes of their success. The project manager and his staff would then be able to seek ways of transferring these causes of success to improve the performance of the less successful units, or to develop new units or projects based on the successes.

By using feed-forward monitoring, a project manager and his expert staff need no longer be burdened with full responsibility for providing solutions. Feed-forward enables them to supplement their own experience of what has worked elsewhere in the past with information about what is working here and now, in individual units within their project. By spreading these isolated successful practices more widely, the project manager insures that they are fully used to improve the performance of the project as a whole.

To be effective, a feed-forward monitoring system must first recognize that an original or unorthodox method is in use in one part of a project. It then gathers further information about <u>how</u> it is used, and <u>what effects</u> are produced. This information is fed up to the project manager, who, along with others as appropriate, uses it to set new objectives and targets for other parts of the project to which the new method can be applied. Simultaneously, the project manager and his staff seek to clarify further the <u>causes</u> of the innovating unit's success, and then to communicate this valuable "how to do it" information to those project staff affected by the new objectives and targets.

Most feedback monitoring is conducted through a project's organizational hierarchy: the managers of each part of the project monitor the progress of their staff. Their focus of attention is on potential bottle-necks, hold-ups, hindrances and human lapses, since these, they believe, are mainly the things that require action on their part. Thanks to years of practice in feedback procedures, their skill in picking out error from the mass of generally successful operations is highly developed. By contrast, few examples of monitoring for feed-forward have been located in the literature on development projects. However, the idea is not entirely new, and has analogs in other areas. For example, the application of feed-forward is basic to the field of intelligence, which has as one of its objectives the determination, and possibly the emulation, of technical and craft practices being used by other governments. Similarly, industries have nearly always attempted to discover competitors' successful practices. In capitalist economies, this in fact has been one of the chief methods of diffusing innovations, as one firm's success in creating a desirable product has drawn imitators into the field. What would be strange, then, in purposefully building into monitoring systems for development projects the capability of identifying and building on successes?

C. Reporting

All that is monitored cannot and should not be reported. The essence of reporting is selection, preparation, and presentation of data. Reference to Figure 1 will show that the NFAC reporting system used before the Masagana 99 MIS was begun included both too much and too little data. Data requirements were voluminous, yet key indicators had not been identified or highlighted. Many "accomplishments" listed were not important from a management viewpoint, yet many items of concern to management could not be dealt with effectively because continuity with previous reports was lacking, long term trends were not identified, some reports arrived late or not at all, and little analysis of report contents had been performed to prepare data for management decisions. (499, p. 11)

Information systems designers generally agree that an effective reporting system should:

(a) Generate the minimum information necessary for management to take timely and appropriate action;
(b) Establish who is responsible for carrying out the necessary action(s);
(c) Not require excessive preparation and review time by line and staff managers;
(d) Alert management to supporting element needs;
(e) Have a format that will facilitate its use for more than one purpose;
(f) Provide each echelon with the information it needs;
(g) Provide more generalized, well-selected information on the most important indicators as you go from lower to higher levels of management;

(h) Provide for both financial and performance accountability;
(i) Report both favorable and unfavorable data; and,
(j) Clearly indicate the current status of the project. (46, p. 96; 503, pp. 85, 86)

The minimum information necessary for management to take timely and appropriate action cannot be defined as a constant, which would apply to all projects at all times. Rather, the project's characteristics determine what is appropriate. The scale of the project, its stage (research, pilot, demonstration, or production), organizational affiliations and structure, and the personality and capability of the project staff have been found to be important.

Smith has described three kinds of management information systems which cover much of the spectrum of what it is possible to report. At the simpler end of the spectrum, the "status" system is used to periodically inform management whether the project is on, behind, or ahead of schedule, and on, under, or over the budget. This system gives minimal information on technical details, which must be gotten from other sources. Gantt, PERT/CPM, and similar techniques are associated with this type of system. More detailed is the control system, which emphasizes either control by exception (i.e., management by exception, in which managers only become involved when performance is either below or beyond established standards). A variant, positive control calls for managers to be more heavily informed about technical details of the project. The most complex approach is found in the comprehensive system, such as the data banks of technical information which attempt to gather any data which <u>might</u> be relevant. This often requires a high capacity computer. (498, pp. 6-9)

Status reporting systems have in practice proven to be adequate in less complex projects carried out at local levels, and in many research and pilot projects. The scope of this approach can be very broad and relatively unstructured, or relatively narrow and structured. In Comilla, village representatives attended weekly local meetings with the staff of the Development Academy at the Thana Training and Development Centre. The village representatives observed and verbally reported on progress being made in the villages, bringing the villagers' ideas and problems, so that appropriate modifications could be made in project designs. The staff then adapted or set aside unworkable ideas, or negotiated with the villagers if they believed that a necessary innovation was being rejected peremptorily. (275, p. 686)

By comparison, a relatively narrow approach has been associated with progress reporting keyed to specifically defined outputs of the type most routinely included in PERT/CPM networks, such as: first class of paramedics trained; 200 loans made by agricultural credit union; or 150 bags of fertilizer delivered. The latter approach is adequate if an upper-level manager is merely being kept informed of schedules that have been met, but inadequate where innovation and close contact with new developments is called for, as at Comilla.

Put another way, the choice of reporting system relates to whether the projects emphasize "contract" or "problem-solving" characteristics.1/ Contract characteristics are found in those projects emphasizing delivery of a well-defined set of services or standardized technical inputs (seeds, fertilizers, pesticides, etc.). Problem-solving, by comparison, more often relies on working with people to identify their problems and to respond flexibly to their needs. It has usually proven easier to plan, schedule, monitor, and report on activities in the services delivery category; thus a PERT/CPM approach has been adequate for these projects.

The PIM system provided for selectivity in the kind of data which was reported in several ways. First it keyed reporting to plans agreed to in joint session. Second, routine, ritualistic reports were thrown out by changing reporting focus to problems, opportunities, and action required. The content of written reports was re-emphasized by the Management Meetings, where trivia was simply not discussed. Every person had a clearly delineated area of responsibility, and problems in each of these areas were diagnosed. All parties whose support to resolve the problems were named, and short, simple, functional reports and requests for specific assistance were sent to them.2/ In the PIM situation, a simple status report was not sufficient, and the approach used came closer to a control system, with one exception: the standards of reference could be modified by joint agreement during the Management Meetings. The objectives of projects and programs are dynamic variables which are liable to change over time. Kenya's SRDP originated with a concern for school-leavers and rural employment, but moved towards a concern for equity and income distribution. Reporting and evaluation in the early stages would have concentrated on school-leavers. Fortunately, sufficient flexibility was built into the programming exercise and management meetings to allow concentration on the adjusted objectives. The reporting system faithfully reflected the adjustments. (462, p. 123) PIM was designed to deal with specific problems, and therein lies its success.

The MIS system designed for Masagana 99 is a control type system which had to meet a far different set of problems. Masagana 99 is a large and expanding service (or contract) type program and the MIS designed for it seeks to obtain standardized data for a number of pre-determined key data elements from participating provincial field technicians. Centrally processed data is analyzed comparatively and feedback copies of reports are sent to Provincial Governors and their Provincial Action Committees for follow-up action.

1/ See chapter 13, "Extension and Research", for a definition of these terms.

2/ See Figure 4, pages XVI-17 to XVI-19.

FIGURE 4

MONTHLY MANAGEMENT REPORT FOR KAGURU DIVISION FOR NOVEMBER 1971

Based on the meeting held in the Area Coordinator's Operations Room on Tuesday 30 November 1971.

Present (Name)	
	District Officer, Chairman
"	Assistant Agricultural Officer, Kaguru
"	Assistant Community Development Officer
"	Assistant Cooperative Officer
"	District Range Officer
"	Superintendent, Roads
"	Livestock Marketing Officer
"	District Livestock Officer
"	Assistant Livestock Officer
"	Health Inspector
"	Area Coordinator, Secretary

Next Meeting: Wednesday 29th December at 9.00 a.m. in the Area Coordinator's Operations Room.

PROGRESS AND ACTION SUMMARY

PROJECT/ OPERATION	TARGET BY 30.11.71	ACTUAL AT 30.11.71	ON TIME	ACTION REQUIRED	
				ACTION	BY
Dips					
1.c. Agreed by MFP	Letter rec'd by MOA by 31.10	Not yet rec'd	No	Expedite	MFP
2. Funds Release	AIE for £3,300 rec'd by PDA and DIO	Not yet rec'd	No	See 1.c.	MFP/ MOA
5.a. Organise self-help funds collection	Complete for 8 dips	Complete for 9 dips	Yes	Continue	DO ACDO

PROGRESS AND ACTION SUMMARY (continued)

PROJECT/ OPERATION	TARGET BY 30.11.71	ACTUAL AT 30.11.71	ON TIME	ACTION REQUIRED	
				ACTION	BY
b. Obtain self-help materials	In hand	In hand	Yes	Continue	ACDO
c. Organise self-help labour	In hand	In hand	Yes	Continue	ACDO
Maize Credit					
3.c. Approval by AFC of loanees	AFC HQ approvals for 900 acres rec'd by AFC Branch Manager	Not yet rec'd	No	Expedite	AFC HQ

etc. etc. (additional projects)

PROGRESS AND PROBLEMS

Dips

Self-help contributions have improved. 9 dip committees have completed collection of Shs 6,000 each, one more than the end-of-month target. Obtaining self-help materials is well in hand for all 11 dips and local enthusiasm is so high that organising labour poses no problems.

Construction due to begin on 1 December is now held up by the release of funds. MOA has approved but MFP approval is still awaited. If funds are not released soon, the entire construction programme will be delayed and the local staff will be demoralised, having promised the dip committees that government would act as soon as their collections were complete. Early action requested.

MFP and then
MOA, PDA, LO

Maize Credit

This project in which a great deal of staff time has been invested and which has roused the hopes of some 450 farmers, many of whom have prepared their land, will have to be abandoned if the AFC HQ approvals are not received by the AFC Branch Manager by 10 December, as the rains and planting will not wait. Even if the authority is received by 10 December, it will be very difficult to get the seeds and fertilizer to the farmers on time. AFC HQ

etc. etc. (additional projects)

PROJECT PREPARATION

Family Planning

A draft workplan for 1972 is being prepared by the Provincial Medical Officer with the assistance of the Area Officer, Family Planning Association, for the experimental family planning/rural health project. Funds for this project were included in the 1972/73 Draft Estimates proposals. The workplan runs from February 1972 to June 1976. It will be considered at the next MMM on 29 December 1971.

etc. etc. (additional projects)

The system calls for a high degree of technical capability and a prescription in advance of the tolerable limits of performance, that is, a statement by management of what it wants to happen, for example, an acceptable range of productivity in rice cultivation. (498, pp. 9, 21, 23)

Use of a system such as the Masagana 99 MIS presumes a high degree of competency by field staff who submit data, or at a minimum, a sufficient understanding by those reporting to guarantee data accuracy within acceptable limits. One report indicates that the MIS represents a new technology not yet appreciated at the provincial level in the Philippines, and that failures to understand the system have resulted in problems of reporting performances, including bloated figures in some cases. (505, p. 73) A modular training package was presented to provincial staff in May, 1976, however, covering the MIS, statistical survey and analysis, and time series analysis, in order to alleviate the reporting problems to some degree. (499, p. 7)

Projects do not normally use a comprehensive management information system because of the expense and the amount of time involved in establishing broad-based data banks requiring analysis by a good-sized staff. Such systems are therefore associated only with very long-lived, large-scale projects, or with continuing programs. (498, p. 7) Such systems have been developed for programs such as those operated by SUDENE, in Brazil's Northeast, to provide a continuing analysis of major foodcrops on a seed-to-consumer basis, covering all steps from planting through storage, processing, marketing, and retail sales.

D. Control Procedures

Traditional control procedures, which include budgeting, cyclic reprogramming, accounting, and auditing have long been widely if not universally accepted as management tools. (500, p. 4) Such procedures, while necessary for good management, are not sufficient to insure proper control in projects. Projects, because of their characteristics, require more, with the nature and extent of the additional control procedures determined by a number of factors. Major determinants include the type of project, the implementing organization, and the degree of deviance from established standards which is considered acceptable.

Considerable variance exists in the kinds of monitoring/reporting/control procedures which have been found appropriate for different types of projects. One major category of projects is what has been referred to previously as "problem-solving" projects. This includes such projects as those in the Comilla Program, in which the technical staff, by working with villagers and farmers, provided assistance in identifying basic problems and developing projects which the local people could carry out to overcome those problems. In such projects, the responsibility of the Comilla technical staff was not to provide pre-designed production inputs, but rather to assist villagers and farmers to define and solve problems they considered

most important. This required an approach in which problems were defined a little at a time, so that projects were designed by steps, as people became more able to define and manage solutions to their own problems. Critical path scheduling or even more general designation of quantified performance indicators in advance was not proper for this kind of effort. A further problem was that monitoring or measuring of inputs alone would have yielded no knowledge of progress.

When the local people had identified projects and roughly worked out solutions with the Academy staff's assistance, the Director of the Comilla program had to have a means of getting information about implementation. His areas of major concern were about what economic and social change was taking place in terms of acceptance of new agricultural practices, development of reading skills, rate of formation of village cooperatives, and rate of acceptance of new programs, such as women's education. (494, p. 495) Observation of previous local change programs, notably the V-AID programs in Pakistan. had led the Administrator to the conclusion that it is not primarily the outsider who successfully initiates planned change, but the insider from the village who first learns about the modern world outside, then returns to the village to talk about his new experiences. (493, pp. 12, 13) The Academy faculty had also discovered that while national development workers (N.D.O.'s) played an important part in disseminating information, the N.D.O.'s had little influence in changing farmers' practices, because they knew little about the practical aspects of agriculture. Rather, farmers got advice on agriculture from friends or acquaintances who were considered to be good farmers. The Academy staff reasoned that, because the government workers were only acceptable as dispensers of information, while trusted villagers or farmers were turned to for advice, it was more logical to use an influential villager or farmer as a teacher to begin with. On this basis the Comilla Thana Training System began. This was to be one of the most significant monitoring/reporting/control elements in the Comilla project. (493, p. 65)

Under this system, trusted, leading local farmers were hired by the Academy and given a short training session. Then they returned to the villages near their homes to try to organize groups of farmers who were interested in bettering themselves. When such a group was formed, an Academy staff member sent a cooperative organization expert to help the group organize a primary cooperative society. The group, as one of the steps in agreeing to a ten-point program for organization, agreed to select from their number a member whom they trusted, who was then sent to the Academy once a week for training. This person became the Organizer and teacher for the group. Regular member education discussions were held thereafter to disseminate information from the Academy. Conversely, the Academy modified its plans on the basis of feedback from the Organizer. The group would pass through a trial period while it practiced the ten points of the program. If it made a good start, it would be accepted into a pilot cooperative. (493, pp. 14, 15)

A second control facet was introduced by selecting one member of each village cooperative to serve as the Business Manager of the organization. This man became responsible for keeping proper and complete accounts and insuring that regular cash and in-kind savings deposits were made by the group. (494, pp. 493, 494; 493, p. 15) Gradually, however, it became apparent that friction and infighting occurred between the Organizer/Teacher and the Business Manager, and the two roles were combined into one. (494, p. 494)

Feedback, and to some extent feed forward, were built into the system at Comilla. The ten-point program provided both guidelines and a broad way of gauging progress. Selection of the Organizer by the people placed a great deal of monitoring and managing/control authority with the people. Yet another link in the control chain was put into effect by direct monitoring by the Academy staff and frequently by the Director himself. There is often no substitute for direct contact, and the size of Comilla thana (about 100 square miles) made such contact relatively easy.

At the opposite end from the project oriented to problem solving is the project which has as its primary concentration the delivery of a package of practices or inputs. (This is analagous to the "contract" project defined in chapter 13, "Extension and Research.") These projects often have the objective of increasing farm income by providing technological innovations which, if applied systematically, are known to result in increased farm yield. Assuming that there is a direct relationship between the visits of extension agents, farmer agents, or others who can provide instructions on the use of the technological package, and farm outputs, and assuming that supplies and equipment are available so that farmers can make use of the technology on time and at an adequate level, it is possible to establish a schedule in advance of implementation which can provide reporting and control reference points. Most of the projects in this category are ones applying to cash crop development, an example of which is the Kenya Smallholder Tea Project.

External financing for tea processing in Kenya was possible only if the quality and amount of tea which would be forthcoming were to be guaranteed by a planning and organizing body. The Kenya Tea Development Authority (KTDA) was created to fill this role. The KTDA was to exercise close control over annual planting, nurseries, field supervision, inspection and collection of green tea leaf, and the sites and operations of factories. This close supervision was necessary because the quality and yield of tea depend greatly on meticulous, specialized care by the grower. Planting, pruning (pegging), plucking, and other steps in the growth cycle must be precise, or both yields and quality of lead can fall drastically.

The KTDA is governed by a Board, tea committees at divisional, district and province levels, an executive staff, and a field staff. The Board, consisting of governmental executives, growers, and lenders, is responsible for major policy and financial decisions, and it selects the General Manager. Tea committees discuss local

policies and disseminate policy decisions to growers. By allocating planting material and by attracting the more successful growers, the committees exert a strong control function over other growers. The committee members also adopt and influence others to accept production standards. The executive staff, located in Nairobi, administers leaf collection, supervises nurseries and growers, and handles most operational matters. The field staff is seconded from the Ministry of Agriculture. The two Senior Tea Officers supervise field development, inspection, and collection of leaf for their regions, each supervising a number of Tea Officers who are in charge of development and extension operations in the Senior Officer's district. Each factory also has a Leaf Officer in charge of leaf collection, keeping a record of green leaf delivered, and paying growers for delivered green leaf.

Under such highly technical and supervisory conditions, control is an ongoing process which is measured both by inputs and outputs. Visits by Tea Officers and Leaf Officers come at prescribed times, and techniques of planting, husbandry, and collection are overseen and recorded. It is thus possible to use scheduling devices and periodically to check progress against pre-set schedules. KTDA maintains a tight record over its junior staff, which is required to visit each of its growers about six times a year to grade his growers against established standards, through a field records system. When leaves are plucked, they are taken to a drying center where each batch is weighed and registered. By all these measures, the KTDA operates as an autonomous and authoritarian body, which has proven to be highly successful in improving tea quality and yield while increasing returns to the smallholder. The operating cost for producing green tea in 1970-71 was about only one-tenth of the 1960-61 cost.

Comilla and KTDA represent almost polar extremes in project types in terms of the problem-solving and technologically complex package of services concepts, yet both enjoyed more than average success. Each employed an approach that was appropriate given the objectives of the two projects, and the monitoring/reporting/control techniques adequately reflected the objectives and overall operational approach in each case. Looked at another way, Comilla was an experimental project which reached only the pilot stage before being cancelled out by political events. The KTDA, by comparison, reached large-scale production. As projects move along the path from research to pilot to demonstration to production, it is usually possible to monitor and perform control procedures with a greater degree of specificity -- although implementation at each stage brings new problems and not a few surprises. Control at all stages must therefore be able to be applied flexibly in response to changed conditions, but this is especially true for projects in the early stages.

The Programming and Implementation System (PIM) used in Kenya's Special Rural Development Program (SRDP) represents an intermediate approach between a problem-solving and an inputs delivery (contract) approach. It was developed to deal with a problem of planning, programming of funds, time, and people through procedural means. The

designers of PIM saw a great need to move away from an over centralized control system in which orders originated at the capital and were transmitted downward, to a system in which field staff and responsible workers would respond to management which gave them a part in drawing up their own work plans and setting their own work targets. (462, p. 78) The concentration was not so much on the ultimate users, i.e., the client groups in Kenyan society, as on the bureaucracy itself. There was no guarantee that this approach would change the target audience itself, for example by reorienting the field staff's efforts away from larger farmers to smallholders and subsistence farmers who needed assistance most desperately. Field staff have as often directed their efforts toward those who are prepared to accept new practices, which means the more successful, cash-crop farmers. Nonetheless, the designers of the PIM approach reasoned that a bottom-up planning/programming approach would lead to a more effective control system for the SRDP, and worked for the institutionalization of PIM procedures with this in mind. (462, pp. 78-83) While there may have been many reasons for this, the significant consideration for managers and field staff is that it is more difficult to assist client groups to identify and resolve their own problems by planning and implementing projects if the manager has himself had no experience with a bottom-up or decentralized effort. PIM allowed the field staff of the SRDP to experience directly what it meant to plan and put into action their own ideas, under supervision and with guidance from above.

One effect of the PIM system was the way in which it changed the role of workers and managers at different levels in the SRDP. Before PIM, centrally-set work programs called for field staff to respond to targets from above, and to submit fairly detailed progress reports. When detailed reports are submitted from the field to headquarters, there can be one of two results: the reports can be read, consuming considerable managerial time; or, they can go unread, in which case they are of less than zero value, for they have already consumed the time of the preparing staff. Whichever course is taken, valuable time is lost. With the PIM system, clear agreement was reached in the Annual Programming Exercise as to the nature and scope of proposed projects. This clarity and expressly stated responsibility was further developed during the periodic (often monthly) Management Meetings. As one consequence, an unheard of reversal in communications began to take place. Whereas before PIM all orders were directed down, now requests for commodities and resources began to flow upward. Field staff began to request of Area Officers and Area Officers of headquarters, assistance to meet project schedules and objectives as jointly agreed to. Control had moved down the hierarchy, with concentration on details at lower levels, and more time consequently freed for managers at higher levels to concentrate on broader issues.

Most projects fall between the extremes of problem-solving (e.g., Comilla), and inputs delivery (e.g., KTDA). For such projects, a control system may have to incorporate aspects of both systems. Project designers and managers should be cautious, however, not to attempt to use procedures which have proven successful for problem-solving when inputs delivery is the major task, nor to attempt to impose a rigid overseer type of control when a more gradual and open type of problem-solving is called for.

E. Multiproject and Program Monitoring, Reporting, and Control

Aspects of the Masagana 99 MIS, the PIM system, and the Red Book system have been described insofar as they provide guidelines to project monitoring, reporting, and control. In addition to the lessons they and other systems have to offer with regard to individual projects, they may also be studied for their application to multiproject and program management.

PIM's procedural aspects -- the Annual Programming Exercise and Phasing Form, the Management Meetings, and the Action Report -- are both the tools used to achieve a successful management process and the reflection of that process in practice. They were used to refine and build on practices that are common in ministries and agencies, such as planning sessions, periodic reviews, and the issuance of reports to keep offices and divisions of agencies informed. PIM was not a shockingly new concept which called for broad-scale reorganization, but was a technique for improving the effectiveness of existing organizational efforts. Nor was PIM expensive. The Special Rural Development Program (SRDP) had field staff already assigned; PIM was designed to make better use of them.

The SRDP, in common with programs in general, was composed of groups of projects, to which funds, staff, and other resources were committed based on cyclic (usually annual) programming, budget formulation, review and approval. Project plans were drawn up and approval given at the central governmental level, and instructions were conveyed downward to field staff at the district and area level to proceed with implementation.

The designers of the PIM approach believed that the field staff -- middle-level managers and first-line field workers -- represented a potential for improving program operation by being able to exercise their initiative. In short, they believed that greater productivity and imagination would be possible if restrictions on performance could be removed, and performance guidelines substituted. The procedures forming the basis for PIM sought to enhance local initiative by involving field staff in project formulation through the Annual Programming Exercise under the direction of the Area Coordinator.

Because PIM was area-oriented, that is, designed to deal with the projects taking place in a geographic area, rather than sectorally oriented, the Area Coordinator (AC) became the multiproject director for each area. Multiproject control was exercised first, by virtue of the AC's role as chairman of the Annual Programming Exercise, and second, as director of the Management Meetings, when the AC met with those responsible for local level implementation. A further measure of "control" was exerted horizontally, to other agencies involved in implementation, and even upwards, to higher officials in the SRDP, by means of the Action Report, through which the AC identified issues needing action and described the

implications of delay. (462, pp. 45-47) Needed actions were clearly described, and the different levels -- ministry, province, district, sub-district, and local -- were quickly informed.

In terms of supervision of field staff, more informed choices for allocation of staff were made possible by the introduction of PIM, which allowed Area Coordinators to compare the needs of several projects, to determine where needs were the greatest, and to act accordingly. In addition to making choices between competing priorities, it also made it possible to undertake organized work planning for the staff and thus to assure work planning both by targets for crop seasons as well as for more routine activities associated with livestock and rural (community) development projects. (462, pp. 69-71)

Malaysia's Red Book system was one of the sources to which the designers of PIM looked for guidance. Malaysia had also suffered a gap between planning and implementation which the Red Book was designed to fill. In Malaysia, it was necessary to create the National Rural Development Council and State and District Rural Development Committees on a nationwide basis. From this standpoint, Malaysia's problems were enormous. Fortunately, the infrastructure for the development of the Red Book system had been developed by the British Army during its anti-communist campaign in Malaya. The Red Book system thus emerged in the paramilitary trappings of the operations room and areal maps. The District Operations Room, as the point in which information was gathered on all projects in effect in the District, became the "nerve center" for multi-project control.

During normal operational periods, the District Operations Officer was in charge of maintaining the Red Book and running the Operations Room. When the Deputy Prime Minister made personal visits to each district to see how the program was progressing in each area, he might himself take charge of operations and frequently issued on-the-spot orders to try to bring projects back on schedule or to insure that there would be no serious lags in implementation. Following the Deputy Prime Minister's visit, a summary note on his meeting was sent to the State Development Committee and to the Ministry of Rural Development within three days. (502, p. 147) The analysis of the most significant problems in each project during the same briefing made it easier to compare the projects and assign resources based on a priority sequence.

Because of the top-level political support given to rural development efforts by the Deputy Prime Minister, it was possible to accomplish the installation of the Red Book system across the nation in a relatively short period of time. Further, widespread reorganization was effected in Malaysia which will not be possible in the short run in some countries. It is not possible to separate completely the effects of political support from the other valuable aspects of the Red Book system in the case of Malaysia. It can be conjectured that without political support, the Red Book system would not have worked. It is probable that without such support,

it would not have been nearly as effective as it was. But as the PIM system shows, it is possible to bring about many salutary changes by procedural means by building on the reservoir of potential ability that exists in middle and lower level staff.

Multiproject control systems designed for research and development projects in the United States reflect some of the same problems faced by the designers of the Red Book and PIM systems. One system designed for the Radio Corporation of America (RCA), a leading U.S. firm, was devised to allow management to control a number of both production and research and development projects of varying duration and technical complexity. RCA needed to deal with projects which cost anywhere from a few thousand to millions of dollars and which could last from a few months to a few years. While the company had control systems for individual projects which worked effectively, they needed a system of project review which would give an overall picture of costs and scope of efforts so that each project would not have to be dealt with in a "brushfire" approach, in response to emergencies that arose.

Under the system adopted, project managers developed the action plan for implementation of the project and submitted the plan to top management for review. Periodic reviews of progress were then made, using a Program Status Report form. This form enabled project managers to present cost, schedule, and technical status simultaneously, allowing management to assess quickly which projects required special attention. Each project manager was required to evaluate his projects and to answer whether they were running on schedule, stayed within planned costs, received adequate funding, and met technical performance requirements.1/

Because a large organization might have many projects to review, and since the time of top managers is always difficult to obtain, RCA took a further step to aggregate and display multiproject information visually. In common with the PIM Action Report and the Malaysian Operations Room graphs and charts, the Program Status Report and project status board are designed to give higher management officials a rapid overview of programs composed of numerous discrete projects. RCA, for example, reviewed about 100 projects at a time with this system. The RCA review system was more akin to the Red Book approach in that reviews could be held at any time for any project, because some projects which are more complex or more innovative require more frequent review. It is not expected that higher management would find it necessary or even possible to review all development projects within a province, for example, on a daily basis; however, some projects may require considerably more attention than others, and a "de-cycled" review schedule may be more appropriate. In other cases, the PIM approach, emphasizing rather regular Management Meetings, may be more appropriate.

1/ See 528, p. 32, for an example of the Program Status Report.

Evaluations of the effectiveness of the multiproject control systems discussed herein have been heartening. In Malaysia, the Ministry of Rural Development is reported to have been successful in attaining output goals and to have disseminated organizational innovation. By standardizing funding request procedures, the flow of money and resources for development from national and state levels for rural development was increased. The "pipe line" of allocated but unused funds was reduced, narrowing the planning to implementation gap. From 1960 forward, there was a steady increase in the proportion of actual to allocated development funds. The actual Red Book system itself spread throughout the country, and university students produced a Blue Book to help in the development process. Internal problems which had to be overcome in the Bureaucracy included coordination of diverse elements and stimulating increased productivity. By orienting the bureaucracy to output goals and by providing avenues through which flows of communication were channeled, the Red Book system enabled the potential of the bureaucracy to be tapped. Rigid and highly specialized agencies had developed out of the colonial bureaucracy base which Malaysia had inherited, and overspecialization and compartmentalization of activities was only overcome after a long struggle. The areal base of operations, i.e , district operations centers for all activities in the district, was one of the tools which broke down the inter-agency jealousies and isolated operations.

Evaluations of the PIM system, while not giving quantitative measures of PIM's impact, have observed that PIM was developed in cooperation with the field officers who were to use it, and that PIM was indeed oriented toward solving implementation problems. The field staff was ready to implement it, as they had become familiar with its provisions in the course of its preparation and testing. PIM was not, in other words, prepared at a central level and put into action by fiat, nor was it forced on the field staff by other means. There have been criticisms about PIM's future because, in some evaluators' opinions, the headquarters staff was not as well prepared as the field staff to accept and implement the new system, which called for wide decentralization of planning and coordination.

The key question raised by this evaluation is: will the District Officers be allowed to perform their job more capably if the PIM system does not receive strong support at high central levels? In any country, support at higher levels has been found to be extremely important to success, as evidenced by the support given by the Deputy Prime Minister of Malaysia to the Red Book; the support of the Office of the Presidency for the implementation of the PIDER rural development project in 100 micro-regions of Mexico, and the support of the top executives of RCA for the Program Status Report. Multiproject control systems must be designed not only to meet technical requirements, but must be workable in conjunction with other elements in the organizational and political system in which they are to be introduced. Decentralized control systems,

while they have proven to be effective, have not been successfully implemented in a short period of time. Consideration of the factors affecting higher management remains an essential factor in gaining acceptance. Concentrating on the successes of programs with proven records offers a positive means of gaining support.

The RCA multiproject system was first tried on a pilot basis in 1962, then expanded to other operations in 1966. Both areas where it was tried showed a reduction in serious implementation problems, while projects on time or ahead of schedule increased. RCA management concluded, as had the designers of PIM, that project managers will accept responsibility for effectively dealing with the problems of their projects if authority is clearly delegated, and if the project manager is involved in drawing up project work plans and revising them as necessary. The management of RCA was pleased with the results of the system, which was neither complex nor expensive. As has been true of many other effective systems, the RCA approach encouraged managers to accept responsibility for the outcome of their projects, while making clear to them the kind of results and level of quality which was expected of them. (528)

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