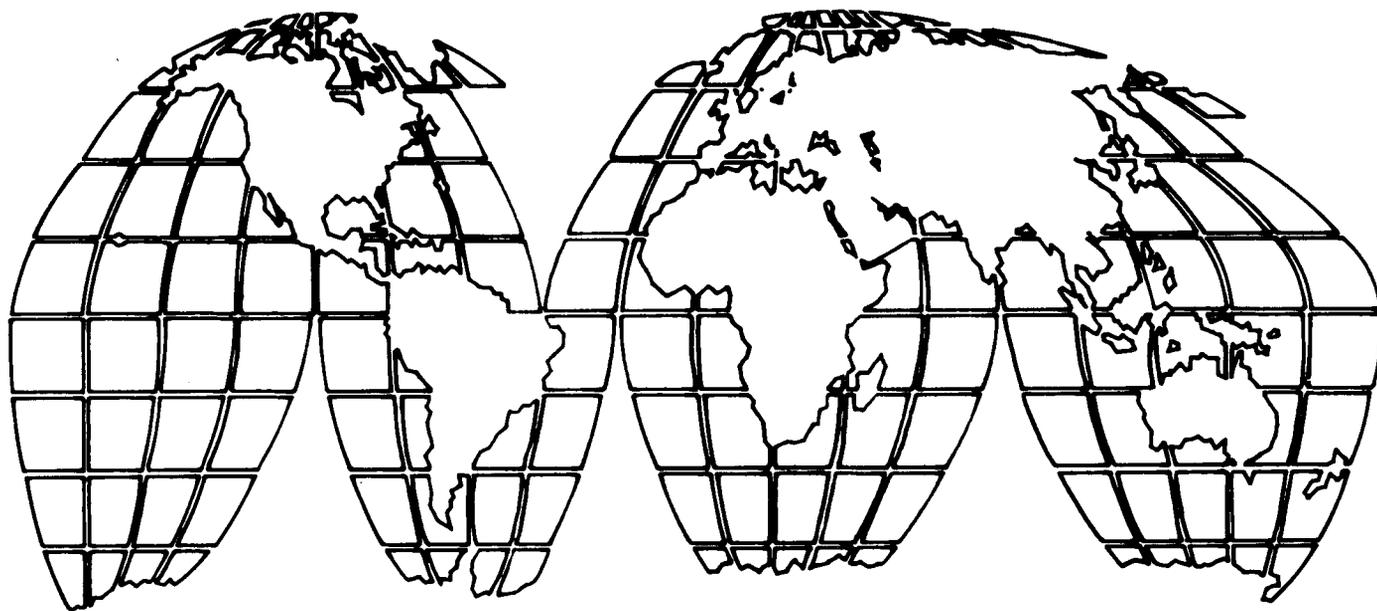


A.I.D. Program Evaluation Discussion Paper No. 21

**The Development Potential Of New Lands
Settlement In The Tropics And Subtropics:
A Global State-Of-The-Art-Evaluation With
Specific Emphasis On Policy Implications**

BEST AVAILABLE



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**The Development Potential Of New Lands Settlement In The Tropics
and Subtropics: A Global State-Of-The-Art Evaluation
With Specific Emphasis On Policy Implications**

Executive Summary

A.I.D. Evaluation Discussion Paper No. 21

by

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Institute for Development Anthropology
and
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U.S. Agency for International Development

September 1984

**The views and interpretations expressed in this report are those of the
author and should not be attributed to the Agency for International
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PREFACE

The Center for Development Information and Evaluation's interest in this paper grew out of our work in both integrated rural development and irrigation. The lessons and analysis have been useful in our reviews of both. The paper was written in 1981 for AID's Bureau for Science and Technology, Office of Rural and Institutional Development. The continuing interest in resettlement throughout the Agency indicated the importance of getting this experience widely disseminated. Therefore, the two offices joined in reprinting this excellent work to exploit the report's potential to the fullest.

The length of the full report (406pp.,) limits us to reprinting the executive summary. The Johns Hopkins University Press is publishing a revised and updated version in book form so the full report soon will be available to the general public. Meanwhile, we hope the readers find this summary version useful and interesting.

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FOREWORD

An earlier edition of this paper was submitted to The Rural Development Division, Bureau for Science and Technology in October, 1981 as the executive summary of a global evaluation of the development potential of new lands settlement in the tropics and subtropics (AID/DSAN-G-0140). The history of that evaluation dates back to 1977 when the Institute for Development Anthropology (IDA) submitted an unsolicited research proposal to AID. This attracted the interest of Dr. Alice Morton who played a major role as the responsible project officer in eliciting the interest of several country missions and in securing approval and funding during 1979. Evaluatory research began that summer under my supervision and continued until October, 1981 when a 406 page report was submitted to AID. Since both the 1981 report and the executive summary have received only limited circulation, I am delighted that the A.I.D. Center for Development Information and Evaluation has decided to publish the summary within its ongoing series of evaluation reports.

As outlined on page seven, the methodological design of the 1979-1981 evaluation included three components. These were a literature search which provided systematic information on over 100 settlement areas in 35 countries plus Micronesia and Melanesia; field studies in four countries in Africa and Asia by grantees funded through the evaluation; and site visits by myself to those countries and five others in Africa, Asia and the Middle East.

Though the initial evaluation ended in late 1981, assessment of the policy implications of new lands settlement as a development intervention continues today through the Clark University/Institute for Development Anthropology Cooperative Agreement on Settlement and Resource Systems Analysis (SARSA) which is also funded through ST/RD/RFD. Since SARSA has provided continuity to the research started in 1979 as well as the possibility of new research, it is appropriate that this report should be considered part of the Cooperative Agreement's published outputs.

Continuity of research continues in Sri Lanka where Kapila P. Wimaladharmasiri and I carried out evaluations of the settlement component of the Accelerated Mahaweli Project (AMP) in 1979, 1980, 1981 and 1983. While the earlier research was funded under "the global evaluation", in 1983 the Cooperative Agreement supported Wimaladharmasiri's ongoing involvement. As for new research, a Cooperative Agreement proposal that evaluatory research be undertaken in the San Julien settlement area in Bolivia has been well received by AID/La Paz and the relevant government agency (FIDES). Evaluatory research may also be extended to other settlement areas of the humid tropics of South America.

Since fieldwork under "the global evaluation" was not undertaken in Latin America, this research provides an opportunity to assess the utility of the conceptual framework and conclusions presented in this report against the Latin American experience. Also a possibility is an expansion of SARSA's involvement in the 1984 Mahaweli research program in

Sri Lanka to include studies of how the AMP can best realize its potential for generating more farm and nonfarm employment.

Current research on new lands settlement through the Cooperative Agreement, and through other Institute for Development Anthropology projects with a settlement component in Zimbabwe, Zambia, Sudan and India supports the major points presented in this report. Though over two years have passed since its submission to AID, I have no major revisions to suggest at this time. The Institute for Development Anthropology has begun an assessment of the World Bank's experience with new lands settlements which will be based on comparative analysis of the Bank's project completion and evaluatory audits for at least 30 settlement projects. To be completed later this year, this assessment will provide a further opportunity to test and expand the framework and conclusions which are presented in this report.

Thayer Scudder

I. GOALS

This global evaluation of new lands settlements in the tropics and subtropics has had two major goals throughout. The first was to provide a "state-of-the-art" analysis of new lands settlement as a development option for settler, farm laborer and nonfarm families; national development agencies; and international donors. The second was to demonstrate the development implications of current knowledge in order to provide information which could be used for improving settlement design, implementation, management, and evaluation.

II. NEW LANDS SETTLEMENT DEFINED

A. INTRODUCTION

New lands settlement is defined as the spontaneous and sponsored settlement of areas which are largely uncultivated at the time of their occupation. It includes what has been referred to in the literature as "colonization" (especially in Latin America and in Indonesia prior to independence), "resettlement," and "transmigration." All these terms emphasize the settlement of land by people rather than land reclamation or land preparation as such.

Aided by international development assistance, many national governments have attempted to plan and implement sponsored settlements as one of a variety of mechanisms to realize various economic, social, and political goals. Generally speaking, sponsored settlers are selected from established communities according to a relatively narrow set of age and other criteria and then are required to follow a closely supervised program of agricultural development for the production of annual and perennial crops. To date, returns have been disappointing, while costs per settler family have increased steadily. According to the World Bank's Agricultural Land Settlement (1978b:16), "Typically, evaluation of settlement projects three to five years after the start of implementation shows economic rates of return at least 50 percent below those in project appraisal documents." (Van Raay and Hilhorst [1981:7] make the same general point.) Even in the more "successful" cases multiplier effects have not been impressive. Unfortunately few evaluations are carried out over longer time intervals so that planners tend to be unaware of those cases in which major multiplier effects have occurred and, of course, they also tend to be unaware of the nature of these effects.

Governments have also exaggerated the capacity of new lands settlements to absorb population surpluses. According to the World Bank's Agricultural Land Settlement, massive government sponsored settlement in Indonesia over a twenty-year period has absorbed only

about 5 percent of the population increase in Java during the same time period, while Kenya's major settlement program over a ten-year period has only absorbed approximately 10 percent of the population increase. In Latin America, Nelson reports that new lands settlement has absorbed only 2 percent of the rural population increase (1973:198). This is the general situation.

It would be a mistake, however, to conclude that new lands settlement has insufficient potential to warrant government investment with or without international finance. A major conclusion of this evaluation has been that while planning expectations tend to be too high in regard to the rapidity with which early returns can be expected, they are too low in regard to possible long-term benefits. Throughout the tropics and the subtropics, the majority of settlers are small scale operators. This is a major benefit of settlement projects for low income rural populations. Whereas rural elites are apt to co-opt the benefits of rural development in old lands, in new lands settlements the overwhelming majority of settlers are low income to start with.

Though the term "settler" will be used time and again, it is essential to emphasize from the start that this term refers to the settler family as a production and social unit. Though this may seem to be so obvious as to not require special attention, national and international planners alike all too often write about the settler as if he was a single male, with the term "farmer" used time and again. Not only does this usage emphasize farm activities for the male head of household while neglecting the farmwife and the children, but it also emphasizes the agricultural component to the neglect of the off-farm component of the farming system, the recruitment of settlers with nonfarm skills, and the development of community diversification.

In the definition of new lands settlement, the phrase "largely uncultivated" is important since most new lands are in fact occupied by others (hereafter called the hosts) at the time of settlement or, if currently unoccupied, are almost always the subject to rights of customary use and tenure by the hosts.

In most cases, population densities tend to be relatively low. For this reason, and because the hosts also tend to have relatively low social status and little regional (let alone national) influence and power, their lands are frequently taken away without adequate compensation during the settlement process. And even if they do not lose most of their lands, rarely is a systematic attempt made to incorporate the hosts within the settlement design, hence increasing the chances of host/settler conflict.

The distinction between spontaneous and sponsored settlers refers to whether or not the settlers are self-recruited or respond to the recruitment initiative of a sponsoring agency. It has nothing to

do with the reasons or motivation for leaving current residence for a settlement area.

Though government administrators with settlement experience often remain skeptical, evidence from different parts of the world suggests that generally speaking spontaneous settlers make better farmers in less time and at a lower financial cost than do government sponsored settlers. The comparison here is with pioneer settlers, that is, those who arrive during the first time phase (hereafter called the pioneer phase) of the settlement process. A range of explanatory factors appear to be involved. There is considerable evidence for example that spontaneous settlers have access to more resources than do the majority of government sponsored settlers. Most government sponsored settlers are poor. They are more apt to be landless laborers or sharecroppers than spontaneous settlers whose resources often place them above the lowest 20 percent of the sending population in terms of income. Under such circumstances, it makes sense to combine both types of settlers in the settlement process rather than favoring one type to the exclusion of the other. Indeed, the evidence suggest that without government assistance spontaneous settlement alone cannot generate a process of integrated area development.

B. TYPES OF NEW LANDS SETTLEMENT

In classifying settlement types, emphasis is placed on both the type of settler and on the nature of the involvement of the sponsoring agency or agencies. Four types are separated out for purposes of analysis, although several different types may in fact be represented in a single settlement. These are the following:

1. Spontaneous settlement with very little government or other assistance.
2. Spontaneous settlement facilitated by government and other agencies.
3. Voluntary settlement sponsored by government and other agencies.
4. Compulsory settlement sponsored primarily by government agencies.

1. Spontaneous Settlement with Very Little Government or Other Assistance

In this era of project and program planning and of national development plans, we tend to forget that inhabited portions of the

world have been largely populated by spontaneous settlement. Even today the majority of settlers moving into the last frontiers of the humid tropics are primarily spontaneous, whether to locales in South America, the equatorial belt of Africa, Nepal, Indonesia, or the Philippines.

2. Spontaneous Settlement Facilitated by Government and Other Agencies

To date this type of settlement has been comparatively rare. While the evidence is impressive that spontaneous settlers time and again make better farmers nonetheless there are major disadvantages associated with spontaneous settlement. Three reasons in particular have been stressed. These are the low yields and environmental degradation associated with spontaneous settlement and the tendency of spontaneous settlers to displace the host population.

Though serious, these criticisms need to be placed in historical perspective. While systems of bush fallow or shifting cultivation (as practiced by many spontaneous settlers) have lower biological productivity than primary forests, they also provide the cultivators with the highest yields per unit of labor within the limits imposed by their current technology.

In relating to this influx of spontaneous settlers, governments have tended to emphasize one of three responses. These are (1) to condemn the process and vilify the settlers, (2) to ignore or even encourage such movement but with no provision of assistance to individual settler families, and (3) to facilitate the process of settlement. The first two responses have been historically dominant, although there appears to be a growing awareness of the need for the third.

Without assistance, most spontaneous settlers continue to be primarily subsistence farmers. Furthermore, research indicates that unassisted spontaneous settlement is not even an effective mechanism for land redistribution since over the years the vulnerability of small holders causes increasing proportions to sell out to both rural and national elites.

Accordingly a major recommendation of this study is that governments should assist spontaneous settlers if higher returns (at lower financial costs) from new lands settlement are to be achieved in the future. Assistance can take a variety of forms. All-weather access roads and potable water supplies are crucial, as is credit and some sort of mechanism to provide the settler with secure use rights to the land in question. Access roads and potable water may be best provided through a site and service approach such as has been so successful in a number of low income urban communities in parts of Africa and Latin America.

An especially attractive approach would be for government to establish communities of sponsored settlers around which spontaneous settlers would be encouraged to take up residence. The communities of sponsored settlers initially could serve as local service centers for both sponsored and spontaneous settlers alike. They might also be used to demonstrate appropriate farming systems and other research based programs concerned with community and settlement development.

3. Voluntary Settlement Sponsored by Government and Other Agencies

Sponsored settlement has been emphasized throughout the global evaluation. Proportionately the importance of government sponsored voluntary settlement has been increasing in recent decades in comparison to settlements sponsored by commercial firms and religious organizations.

4. Compulsory Settlement Sponsored Primarily by Government Agencies

Compulsory settlement is rarely carried out for the good of the people concerned, aside from occasional instances of removal as part of a disease control program. Rather it is a by-product of larger scale events in which the future settlers find themselves embroiled.

Because it represents such an extreme example, settlement based on compulsory relocation throws into relief a number of problems which to a lesser extent characterize all types of new lands settlements. These have been studied in considerable detail in connection with dam relocation in the tropics and sub-tropics. The results of such studies have been very useful in improving our understanding of settler responses to settlement, of settlement stages, and of a wide range of issues associated with each stage.

C. THE MAGNITUDE OF CONTEMPORARY SETTLEMENT

Both spontaneous and government sponsored settlement have increased since the end of World War II. While the World Bank's 1978 Issues Paper notes that there are no reliable global estimates on the amount of new land settled during this time period, it also states that "there is no doubt that the extension of cropped area has been a major source of agricultural growth in large parts of Latin America and Africa and, to a lesser extent, Asia" (p 20), with most of the increase being rainfed cultivation.

Looking to the future, the best general summary of the situation is contained in the World Bank 1978 Issues Paper which draws heavily on FAO data. According to those data, "cultivated land in 1970 constituted about 57 percent of the world's total potentially arable land" (pp. 20-21), with over 40 percent of the estimated reserves in Latin America (459 million hectares), followed by tropical Africa with between 15 and 20 percent. Though Asia contains only about 5 percent of the global reserves, approximately 50 million hectares are nonetheless involved. While the above totals are impressive, there is generally a tendency to overestimate the agricultural potential of arable lands in the tropics and especially in the humid tropics. Perhaps over half of the above totals would be better kept in silviculture in the humid tropics and in pasturelands in the semi-arid areas and more arid savannas.

The largest areas of under-utilized potentially arable lands are in the humid tropics where approximately 75 percent of settlement is spontaneous. Presumably, at present rates of settlement much of the remaining land in the humid tropics will be occupied during the next twenty years. The same applies for the savanna environments in Africa, which are the most extensive in the world.

D. CURRENT JUSTIFICATION FOR GOVERNMENT INVOLVEMENT IN NEW LANDS SETTLEMENT

I believe that there is a greater role for government involvement than I and other critics had previously realized. The authors of the Institute for Social Studies Advisory Service (the Hague) 1981 Draft Discussion Paper, Land Settlement and Regional Development in the Tropics: Results, Prospects and Options, have reached a similar conclusion. Noting persistent inter- and intra-regional imbalances in many countries, their summary stated that "the contribution of government-sponsored land settlement to a reduction of these imbalances could be more significant than tends to be the case at present" (van Raay and Hilhorst, 1981:ii). What they mean is that there is tremendous room for improvement provided certain lessons from the past are learned and translated into new approaches to design, implementation, management, and evaluation.

As another lesson from experience, the authors of the ISS Advisory Service report also propose that "land settlement may be an attractive alternative to the further intensification of agricultural production in already settled area [sic], especially if low-cost solutions of land settlement can be developed."

III. METHODOLOGICAL DESIGN

As a comparative and longitudinal evaluation of new lands settlements, the research on which this report is based consisted of three major components. These were (1) a global evaluation of the literature on over one hundred sponsored and spontaneous settlement areas in thirty-five countries plus Micronesia and Melanesia; (2) field studies in Egypt, Nepal, Sri Lanka and Sudan by grantees funded through the global evaluation of specific settlements which have been in existence for a minimum of ten years; and (3) site visits by myself, with and without consultants, to a number of settlement areas in nine countries in Africa, the Middle East and Asia. A special effort was made to select settlements which have been in existence for at least a generation and which were considered relatively successful by administrators and scholars.

IV. SETTLEMENT SUCCESS DEFINED

Successful settlements are those that stimulate an ongoing process of integrated area development. Essential to this definition are linkages between rural and urban sectors, with agricultural development stimulating the emergence of a hierarchy of service centers as well as manufacturing and industrial development within the region. The word "ongoing" means that the development process must be sustained at least into the second generation.

This definition of settlement success as a mechanism for initiating a process of integrated area development is so important that it requires further emphasis. According to the World Bank's 1978 Issues Paper on Agricultural Land Settlement, "future settlement activities should be viewed within a comprehensive development framework which recognizes the need for careful use of all resources in the project area" (p. 8). Moreover, a wide range of considerations "lead to the conclusion that settlement must be planned within an integrated regional framework which includes development of related agro-industrial and service sectors" (p. 40). In a 1978 ILO Working Paper on Employment and Income Generation in New Settlement Projects, Weitz and his colleagues (1978) conclude that successful settlement projects "must be multisectoral. Agriculture does not develop itself. It requires a complex institutional system to support it, market its products, and provide inputs, credit and professional advice. The full capacity of employment generation in new settlement projects beyond a certain size cannot be realized unless there is a simultaneous growth of agriculture and industry. The term 'simultaneous' implies an intrinsic link between the two sectors. . . . In other words, even though a project is based mainly on agriculture, it should include as an integral part of its plan, the establishment of industries" (p. 5). Furthermore, "from the evidence brought so far it seems clear that

integrated planning will bring about the best results from new settlement activities" (p. 65).

In their 1981 Draft Report on Land Settlement and Regional Development in the Tropics: Results, Prospects and Options for the Advisory Service of the Institute of Social Studies (the Hague, Netherlands), van Raay and Hilhorst come out even stronger for regional planning and integrated area development. In their opinion, without explicit linkages "between land settlement and area development, there is the real danger that minimal conditions for attaining a measure of viability cannot be met" (p. 55). And, "if there is one lesson to be learned from past failures, it is the fact that rural development is best served by a specific locational matrix of urban activities and functions. It is not the proximity vis-a-vis main metropolitan centres that matters most but rather the proximity in respects of urban and rural centres in the region" (p. 66).

As these recent statements indicate, the current consensus of those who have completed comparative studies of new lands settlements is that regional planning and integrated area development (including both agricultural areas, rural towns and regional towns) are essential for the development of successful settlement projects. Since the financial costs per settler family are high, averaging, for example, \$8,650.00 per settler family for World Bank-assisted projects between fiscal years 1962-75, major government funding is unlikely to be cost effective unless settlement is associated with major multiplier effects. While these are not frequently associated with government sponsored settlement projects and are rarely if ever associated with spontaneous settlement, area development has been attained in a small number of cases. Furthermore, the evidence is suggestive that it could have been attained in a still larger number if more attention had been paid to certain basic issues associated with the settlement and development process. These are outlined in the sections that follow.

A. SCALE

For new lands settlement to stimulate a process of integrated area development -- with a simultaneous evolution of agriculture, services, and industry -- settler families must number in the thousands rather than the hundreds. Few multiplier effects can be expected from the smaller settlements in terms of nonfarm production and employment. As Weitz and his colleagues state, "Obviously, the benefits of industry cannot be gained if the project is very small; a minimum volume of agricultural raw materials is required to create a market for perishable foodstuffs" (1978:6).

B. THE SPACIAL LAYOUT OF SETTLER COMMUNITIES AND THEIR RELATIONSHIP TO RURAL TOWNS

While there are obvious benefits to the settler of a homestead pattern where the family is surrounded by its fields, in terms of employment generation, the provision of services, and the facilitation of area development a nucleated settlement pattern has the advantage in most cases.

Summarizing various sources the World Bank concludes: "The interests of both settlers and their children are best served in most instances by larger, nucleated settlement. . . . The benefits are of several types -- greater employment opportunities, higher service standards, reduced infrastructure costs, reduced migration to large urban centers, and more balanced regional growth" (1978b:40).

There is overwhelming agreement that settlement projects "must be based on a hierarchy of communities" (Weitz et al, 1978:70), with settler communities linked to, in increasing order of magnitude, rural service centers and rural and regional towns. A major failing of settlement planning throughout the tropics and subtropics is the lack of attention paid to rural towns as opposed to smaller rural service centers with their cooperatives, schools, clinics and other service facilities but with virtually no industrial capacity. In over 100 cases examined during the global evaluation, rural towns were planned in connection with only eleven, and in most of these cases regional towns -- which play a major role in retaining multiplier effects within the area -- were insufficiently emphasized.

If we examine these eleven cases, the majority pertain to the 1970s, suggesting that the trend is moving in the right direction. Partly this is because of an increased emphasis on area development and regional planning. Welcome as this is, the eleven examples nonetheless relate to only five countries. Furthermore, in most cases there is a tendency to emphasize new towns rather than the enhancement of existing towns, even where suitable existing towns exist. Not only is this a more expensive undertaking, but frequently the old town will continue to out-compete the new one.

C. DIVERSIFYING FARMING SYSTEMS

There are three important reasons for diversifying the farming systems of settler families in terms of multiple cropping and the combination of the crop and livestock components. First, such systems tend to be more resilient and ecologically stable and productive economically. Second, they tend to make better use of family labor providing some farm income and status to various family members in the process. And third, they provide food for nonfarm labor and agricultural produce (including crops, livestock, forest products and fish) for processing.

Under reason one, multiple cropping, including the cultivation of a wide range of essential food stuffs, makes sense for the farm family which can then rely on their own produce where necessary. The evidence is also increasing that multiple cropping and diversification of the farming system tends to increase yields per hectare. According to Innis (1980:7), "Research on three-crop mixtures, which is closer to traditional methods, but more difficult to handle with machines, shows that the closer researchers come to traditional methods the higher the yields are for the same inputs."

As for the second reason, diversification has important economic and social equity advantages as it relates to the farm family as a production and social unit. It also better distributes family labor throughout the annual cycle by providing each family member with a variety of activities which tend to be better distributed throughout the year. As Weitz et al (1978:4) state the case for diversification: "Only through the introduction of properly planned additional enterprises into the crop pattern is it possible to fill the gaps of underemployment in the slack season of the agricultural year."

Thirdly, diversification of settler farming systems is still more directly related to area development in that it provides foodstuffs for nonfarm families and raw materials for agricultural and other industries.

D. NET INCOME OF SETTLER FAMILIES

If new lands settlements are to initiate a process of area development, far more attention needs be paid to the net income of settler families than has been the case to date.

The settler family, not the land or the water resources, is the main resource, and the new lands settlement can only catalyze a process of area development if the settler family has the incentive and the opportunity to produce.

Concerning the dynamics of the settlement process, so long as settlers remain close to the subsistence level, it is reasonable to expect them to be risk adverse. As net incomes go up, however, investment strategies change and consumption goes up, hence increasing demand for goods and services which in turn provide increased nonfarm employment opportunities. This point has been documented time and again. In their Agriculture and Structural Transformation: Economic Strategies in Late-Developing Countries, Johnston and Kilby (1975:301) note that "as per capita output in the economy rises a growing share of household expenditures are devoted to manufactured and processed commodities."

Where planners do take into consideration the multiplier effect of increased agricultural production, the conventional wisdom is that most employment generation will be in agro-industry. But what evidence is available (and only some of this applies to settlement projects) suggests that this is not the case. In their World Bank study of the Muda Irrigation Project in Malaysia, Bell, Hazel, and Slade (1980) reported that for every dollar of direct benefits generated by the project, there were eighty-three cents of indirect benefits. Of that eighty-three cents, fifty cents came from increased farmer demand for consumer goods and services rather than from production linkages (with rice milling accounting for only ten cents of the total). After recounting this case, Carroll adds that agro-industry may not be the best way to generate rural employment. Referring to a summary of research studies (in the form of a undated manuscript entitled "An Approach to Spatial Planning for Rural Development" prepared by U.S. Aid's Working Group on the Rural Poor), Carroll (1980) concluded that "small enterprises for production of local household consumption goods engaged about two-thirds of the nonagricultural labor force" (p. 15).

In the literature on new lands settlements, various authors have stressed the risks associated with net incomes which are either too low or too high. As a general proposition, target incomes both in terms of settler incentives to farm and increasing settler demand for a wide range of producer and consumer goods and services, might be best based on the "average national income" or even the "average urban income," depending on the nature of rural-urban terms of trade. Though raising target incomes in this way would reduce the number of settlers employed on the land, in the long run it would probably facilitate area development, including employment generation. Since settler incomes that are too low are a serious constraint to subsequent development, it is better to err on the higher side than on the lower side.

Almost by definition a successful settlement process will create a new rural elite among both settlers and nonfarm families. As they move from the transition to the stage of economic development, many successful settlers can be expected to pursue dynamic investment strategies as their incomes go up. The challenge for planners is to "set the stage" in such a way that settler initiative is encouraged without being too exploitative of others. This can be done in a number of ways. Ready availability of credit for annual production needs and strong settler dominated producer and marketing organizations will help spread the benefits of settlement to a larger proportion of the settler population.

E. EMPLOYMENT GENERATION

Empirical knowledge is scant for assessing the potential of different farming systems and settlement designs for generating employment. Yet the topic is a critically important one, especially

in countries with rapid population growth and high rates of unemployment and underemployment.

New lands settlement have the potential to increase three general types of employment. These are, first, employment of owner/operators and their families on farm holdings; second, the employment of permanent and seasonal farm labor; and, third, nonfarm employment. With few exceptions the planning and implementation of new lands settlements by government and donor agencies has emphasized the first type of employment while ignoring the other two types.

1. Owner/Operators and Their Families

Owner/operators and their families are the key to subsequent development including increased agricultural production, rising living standards, and employment generation including nonfarm employment.

In terms of employment generation, there is no alternative to emphasizing recruitment of settlers working small holdings versus those working medium and large holdings. Not only does emphasis on small holders increase the number of farm owner/operators, but as Johnston and Kilby note, "where income is more or less evenly distributed over broad segments of the population, the result is large markets for comparatively simple goods" (1974:304). Since the production of these requires little technical and managerial sophistication, such goods can be produced within settlement areas, hence increasing the scope for nonfarm employment.

There is an upper limit, however, to the number of small holders who can profitably be settled in a particular area. Unfortunately planners tend to forget this point -- so that increasing the number of settlers beyond a certain level actually reduces employment generation since settler net incomes are insufficient to increase demand for locally manufactured goods and services, and since local production is not sufficiently great or diversified to meet the demand of nonfarm workers for locally produced foodstuffs and raw materials for local processing, the farm enterprise becoming mainly a subsistence operation which perpetuates rural poverty rather than alleviating it.

2. Seasonal and Permanent Laborers

With only a few exceptions, it is unrealistic to expect successful settlers to continue to employ only family labor. Yet time and again settlements are planned on the assumption that settlement allotments must be cultivated with family labor. This position not only ignores the natural development cycle of the family but it also ignores the dynamic nature of settler investment strategies once Stage

Three (economic and social development) begins. As net incomes rise, settlers begin to substitute nonfamily labor for family labor in regard to less desirable and/or less productive agricultural activities. This recruitment of seasonal and permanent labor occurs even on small holdings of several acres.

Furthermore, it is not in the interests of either employment generation or the welfare of farm laborers to pretend that they do not exist or to deemphasize their existence. In large-scale irrigation based settlement projects seasonal workers during the harvesting seasons may outnumber adult settlers. Though hire of laborers is less significant in regard to farming systems based on rains cultivation, even there large numbers of seasonal laborers are used during certain stages of the production cycle.

3. Nonfarm Employment

The general literature on linkages between agriculture and industry, though sparse, suggests two conclusions. First, that the potential multiplier effects of agricultural development would appear to be considerably greater than realized in terms of employment generation in rural areas and, second that national development policies must share much of the blame for the failure of new lands settlements to realize their development potential in terms of employment generation and multiplier effects.

According to the World Bank (1978a), over half of all nonfarm employment in Africa and Asia is still in rural areas -- a situation which we tend to forget because of the ongoing influx of rural peoples into urban areas. Furthermore, nonfarm activities in rural areas provide a primary source of employment and earnings to approximately one-third of the rural labor force where rural towns are included (my underscoring), with this proportion rising to 40 percent where town population in rural settings increases to twenty to thirty thousand residents.

Not only do rural nonfarm activities appear to employ more people than previously expected but these activities also provide a significant proportion of the income of rural households. Chuta and Liedholm present data from six countries which show nonfarm earnings accounting for over 20 percent of the income of rural families. Estimates of 22 percent and 23 percent are presented for Korea and Pakistan, respectively, versus 43 percent for Taiwan and 70 percent for Japan. While the Japanese and Taiwanese cases represent special features nonetheless it should be possible to eventually achieve similar results in carefully selected settlement areas in the tropics and subtropics with careful planning and plan implementation.

F. NATIONAL DEVELOPMENT POLICIES

It is very difficult for new lands settlement projects to sustain themselves through time in the face of adverse national development policies and private sector policies. Where rural-urban terms of trade are unfavorable to the rural sector new lands settlements face a major constraint from the start.

The generation of nonfarm employment in manufacturing and other activities is more directly constrained where industrialization policies favor the development of large scale urban based industries through a range of direct and indirect subsidies. Government and private sector credit policies may be especially critical for both the agricultural and industrial components of new lands settlements, Katzman arguing that the increasing proletarianization of the agricultural labor force in the Northern Parana settlement area of Brazil is due in part to adverse government and private sector credit policies.

V. NEW LANDS SETTLEMENT STAGES

A. INTRODUCTION

A major goal of the global evaluation was to develop a framework which could be used for the systematic analysis of new lands settlements and more specifically for their planning, implementation management and evaluation. In attempting to explain the relative success or failure of new lands settlements which have been in existence for at least a number of years, I developed a four-stage framework. Before outlining this, a cautionary warning is warranted about the use of stages. These are merely tools for coming to grips with a complicated and dynamic process. They amount to simplifying assumptions which attempt to break the settlement process into a series of critical time periods during each of which a range of basic issues need be addressed.

B. SETTLEMENT STAGES

The four stages cover at least a generation and are as follows:

1. Planning, Initial Infrastructural Development, and Settler Recruitment
2. Transition
3. Economic and Social Development
4. Handing Over and Incorporation

In order to be successful, a new lands settlement area must pass through all four stages though the order of the third and fourth may be reversed. These last two stages are "crucial if living standards and productivity are to rise and if continuity and development are to continue" (Scudder, 1981c:13). Though ideally a settlement area should pass rapidly through all four stages so as to realize its development potential at the earliest possible date, in fact a wide range of internal and exogenous factors are apt to interfere, so that a steady movement through the four developmental stages tends to be the exception rather than the rule. Furthermore, many spontaneous and sponsored settlements never reach the third stage of economic and social development but rather evolve directly from Stage Two to Stage Four.

In spite of such variations and various analytical difficulties, it proved to be relatively easy during the global evaluation to place different settlements within a particular stage or between two stages. Furthermore, "the very concept of stages draws attention not only to the fact that new lands settlements have histories but also that these histories are remarkably similar" (Scudder, 1981:13). It follows from this that people and the sociocultural systems in which they are imbedded and interrelated (including settlement agencies) respond to new lands settlement in predictable ways. And these responses have major policy implications.

1. Stage One: Planning, Initial Infrastructural Development, and Settler Recruitment

This stage lends itself to further division into two substages: the first relating to feasibility studies, planning, and design and the second to settler recruitment and the construction of such initial infrastructure as roads and irrigation facilities.

a. Feasibility Studies, Planning, and Design. Ideally, the feasibility studies which are carried out during this substage should consider a wider range of alternatives before a decision is made to proceed or not to proceed with a particular type of settlement. Under planning, a wide range of issues need be considered -- including the scope and scale of the intended farming systems and the settlement as a whole in relationship to regional development. Weitz and his colleagues assume, for example, that multiplier effects are correlated with diversification of the farming system, farm family income, and settlement scale and scope. During the planning phase, consideration should also be given to the extent to which the hosts will be included within the settlement project on social equity, economic, and political grounds.

b. Construction of Initial Infrastructure and Settler Recruitment. The wording "initial" infrastructure suggests that infrastructural development should be phased, with planners establishing priorities for implementing in time different types of infrastructure for settler families, administrators, and other nonfarm families.

As for settler recruitment, far too much emphasis in the past has been paid to the recruitment of individual men as opposed to settler families where attention is paid to both spouses. But settler recruitment should be still more broadly linked during the planning process to the consideration of what types of production systems, what types of communities, and what types of societies are desired so that recruitment can seek out both farm and nonfarm families with the necessary aptitude/orientation, experience, and skills.

2. Stage Two: The Transition Stage

The use of the word "transition" is used to emphasize two points. First, that this is a stage of transition for settlers who in many cases are moving from one habitat to another and, second, that this transitional period must come to an end before settler families can be expected to take risks and increase significantly their productivity. While the duration of the transition stage may be less than a year for a minority of families in settlements which subsequently reach Stage Three, for the majority it would appear to last for at least two years and more often for five to ten years.

During the transition stage many settlers are risk-adverse, which explains why few technical, organizational, and sociopolitical innovations are adopted at this time. Risk-aversion appears to be a coping response to the stress and uncertainty associated with moving into a new habitat -- where settler families need not only come to grips with a new physical and biotic environment but also with new neighbors, an increased government presence in the case of government sponsored settlement, and frequently with a new host population. While "learning the ropes," most settlers adopt a conservative stance, their first priority being to meet their subsistence needs. They favor continuity over change; and where change is necessary, they favor incremental change over transformational change. Where possible, they cling to the familiar by moving into new settlements with relatives, former neighbors, and co-ethnics. They also try to transfer area-of-origin house types, farming practices, and other skills even though they may not be suited to the new habitat.

The transition stage comes to an end when enough settler families shift from a conservative stance to a dynamic open-ended one, hence initiating the third stage of economic and social development. This shift is most apt to occur after settler security is increased

through the production of sufficient food to meet family needs and the settlers begin to feel "at home" in their new habitat.

At this point it is worth mentioning certain policy issues associated with the transition stage. Granted the security oriented and conservative stance of the settlers at this time, it is unreasonable for governments and donors to expect rapid increases in productivity through agricultural intensification during the first five years.

The logical way to improve project performance during these early years of implementation is to shorten the length of the transition stage. This can be done in a number of ways. One relates to settler recruitment. The advantages of recruiting settlers from different villages within the same locale and ethnic area as opposed to different ethnic areas are overwhelming during the transition stage. There are two reasons for this. The first is that neighbors and co-ethnics are much more likely to form self-help groups for land clearing and house building during the early years of settlement which so often are characterized by serious labor shortages. The second is that the potential stress and uncertainty of having to adapt to new neighbors is lessened when those neighbors come from a similar ethnic background.

Another way for governments to shorten the length of the transition stage is to make a conceptual distinction between settlement and development stages. During the settlement stage, the emphasis should be on helping the settlers feel secure in their new habitat at the earliest possible moment. Such an approach does not mean that development activities should be ignored at that time. Just as land negotiation and tenural arrangements should be completed during Stage One to expedite subsequent development, so too are there a similar range of developmental activities which can be implemented during the transition stage. These include, for example, continual provision of crucial physical and social infrastructure and construction, equipping, and staffing of schools. Schools are especially important because one of the first investments made by settlers is in childrens' education. If schools are inadequate in number and quality, government sponsored settlers are less apt to bring their families to settlement areas, hence contributing to instability and labor bottlenecks.

Other developmental activities which can be undertaken by sponsoring agencies include fielding of an appropriate unified extension service, the encouragement of appropriate private and public sector marketing services, and setting the stage through extension and training for the emergence of settler-dominated participatory action organizations. All these activities, however, must be carefully formulated and implemented so they actually facilitate settler initiative and independence rather than promote a sense of dependency which can bog a settlement down in the transition stage for years to come.

To sum up, the early years of pioneering a new settlement area are difficult and stressful. They require a period of adaption which is rarely less than two years and usually much longer. Though timely governmental interventions can shorten the length of this difficult period of coping and transition, it cannot be eliminated, hence underlining the unreasonableness of sponsor expectations that settlers will intensify their production from the very start.

3. Stage Three: Economic and Social Development

The contrast between Stage Two and Stage Three is dramatic: the first characterized by a population of risk-adverse settlers and the second by a population of risk-taking settlers. Since the same people are involved, a dramatic change occurs.

While most settlers concentrated previously on a domestic mode of production involving extensive agriculture, during Stage Three we have observed a wide range of investment strategies designed to achieve higher levels of labor productivity through diversification of the family estate. While more data analysis is necessary, it would appear that settlers follow the same sequencing of investment activities in different parts of the tropics and subtropics. Initially they invest in education for their children. Subsequently additional farm land is sharecropped, leased, and/or purchased and the farming system is expanded into cash crops (including labor intensive, higher risk crops), while the crop component is expanded to cover livestock and nonfarm activities.

Nonfarm activities tend to start on the farm homestead, taking the form of small business enterprises such as crafts, baking, and tailoring which are located within the home. Subsequently, investment expands to nonfarm activities off the homestead but within the settlement area, with these including small general stores and transport for hire in the form of two- and four-wheel tractors, trucks, taxis, and mini and other buses. Still later, investments may be made in urban real estate and businesses.

As incomes go up, many settlers prefer to hire laborers for a increasing proportion of agricultural tasks. Especially in irrigated settlements in Africa, Asia, and the Middle East, the number of seasonal and permanent laborers may exceed the number of settler families.

Farm diversification and increasing net income among settlers also facilitate the development of commercial and service centers which process the produce and serve farm and nonfarm family needs.

4. Stage Four: Handing Over and Incorporation

a. Handing Over. Because of the observed inefficiency of long-established national and special project settlement agencies and because of the frequently negative impact of educational systems on the willingness of settler children to continue farming, I do not consider any settlement to be a success until a degree of handing over control to settlers and other local institutions has occurred and until a second generation of settlers has taken over. Handing over activities to departmental, local government, and settler organizations is a tricky business which can proceed both too rapidly and too slowly. On the whole, however, the problem in the postcolonial era is that settlement agencies retain for too long a period a wide range of activities which could be more efficiently carried out under a policy of devolution to local organizations. Since it is natural for bureaucrats to endeavor to perpetuate themselves in space and time, the problem of inefficient national and special settlement agencies is a major one during the later stages of settlement projects. Indeed, it is so major in some cases as to possibly offset the undeniable advantages of such centralized and hierarchical organizations during the initial stages.

Because of the nature of the educational system and the propensity of settler families to invest in the education of their children, a number of older settlements are having difficulty in passing on farm activities to the children of settlers as the first generation retires.

b. Incorporation. Incorporation refers to the process whereby a new lands settlement becomes an integrated part (rather than a special enclave) of the region within which it is situated. Physical handing over alone is not sufficient. The incorporating agencies must have the personnel and capital resources and the will to take over essential settlement services so these services do not subsequently break down.

Part of the problem is political incorporation, since settlement organizations will not be able to compete for regional resources after handing over unless they are integrated within the political economy of the region. So incorporation has a number of aspects which extend beyond the process of handing over. Furthermore, if larger and more diversified new lands settlements are to realize their potential for catalyzing a process of regional development, incorporation must enable the settlement area to play a major role in influencing regional policies and the implementation of those policies.

VI. BASIC ISSUES ASSOCIATED WITH STAGE ONE [Planning, Initial Infrastructure Development, and Recruitment]

A. INTRODUCTION

Each settlement stage is associated with a wide range of basic issues which must be addressed by planners, administrators, and settlers. Though their proportional importance may shift through time, certain issues characterize all stages; others are primarily associated with a single stage.

To avoid repetition, certain major issues (like settler net incomes, employment generation and multiplier effects) which have been already assessed are not dealt with again except in passing. Other important issues which have already received considerable attention elsewhere in the literature are also not emphasized.

B. PLANNING

1. Keeping the Plan as Simple as Possible

Evaluation after evaluation has emphasized the need to carefully prioritize interventions, stressing a relatively small number of "projects" at a given time in order to realize more complicated program goals.

2. Keeping Financial Costs per Settler Family Within Reasonable Limits

Financial costs are broken down into capital and recurrent expenditures, both of which can be significantly reduced by following courses of action which should actually enhance possibilities for success rather than reduce them. The paragraphs that follow are not meant to be inclusive; rather their purpose is to illustrate a range of policy options which could reduce costs without jeopardizing the chances for project success.

a. Settlement Type. Financial costs go up as the proportion of sponsored settlers increase relative to hosts and spontaneous settlers. According to Judith Tendler, the incorporation of spontaneous settlers within a portion of Brazil's Alto Turi project nearly halved costs per settler family by increasing the number of beneficiaries, on the one hand, and by decreasing the costs of land allocation and settlement per beneficiary, on the other.

b. Location of Settlement. In discussing lessons learned, van Raay and Hilhorst (1981) emphasize that "market proximity is the major determinant of the economic viability of a land settlement

scheme, the general rule being that the highest net income per ha can be realized nearest the market centre" (p. iv).

c. Involvement of the Private Sector. Because of the complexity of integrated area development and its financial costs it makes sense to involve nongovernmental organizations in the development process from the very start. As in Malaysia, private lumber and building contractors can play a major role in clearing settlement areas of timber and in constructing major infrastructure. Such private companies might also be willing to shoulder more of the financial costs of settlement if assured of some of the benefits with lumbering companies, for example, contributing to access and feeder road construction in return for lumbering rights.

Joint ventures between government settlement agencies and commercial companies are another way for organizing a type of cooperation between the public and private sectors that would facilitate land settlement. Such ventures could involve forest product and mining companies as well as agribusinesses. Here I am not referring so much to the provision of infrastructure as to the actual settlement of people around the margins of a forest product, mining, or agribusiness enclave -- with settlers providing produce to the enclave both as food and, in the case of forest product companies and agribusiness, as products for processing.

There are also other ways in which the services of the private sector can be used both to reduce financial costs to the government and to provide a range of management and other services. Current government policy in the Mahaweli Basin of Sri Lanka in connection with the Accelerated Mahaweli Programme is of special interest here since the Mahaweli Authority of Sri Lanka is experimenting with a number of mechanisms for involving the private sector. For example, the MASL has arranged for Hatton National Bank Limited to have exclusive lending rights to settlers in part of System H, while the Ceylon Tobacco Company, Limited, has recently begun to manage H-9.

d. Worker/Settlers. Periodically, attempts have been made to recruit worker/settlers who will clear and prepare their own lands for cultivation, and construct the infrastructure serving those lands.

Worker/settlers often arrive without their families simply because living conditions tend to be extremely difficult. Because of these difficulties and because worker/settlers often come alone, every effort should be made to ready the land for cultivation and family occupancy during the first year; otherwise the hardship and suffering of worker/settlers is apt to be reflected in low morale, increased illness, suspicion of government intentions, and high "drop-out" rates.

e. Housing. Roads and government built permanent housing tend to be the two largest single costs associated with settlement

based on rainfed agriculture. While the former are necessary, the latter are not. In addition to high financial cost, government provided housing often is both culturally and sociologically inappropriate. It may constrain family activities and the normal developmental cycle of the family because of regulations as to how the housing and the house plots are to be used. Permanent housing also tends to be associated with relatively small house plots on which it is not possible for the settler's heir to build his/her own housing so as to be near aging parents. In effect, government provided housing locks the social organization of the settler family into "concrete," so to speak, while the size of the household plot more often than not is inadequate for the keeping of animals and the planting of household gardens. For all these reasons, it makes sense for settlers to build their own housing wherever possible.

f. Roads. Time and again roads are the major capital expenditure associated with new lands settlement. In Latin America, for example, they accounted for 38 percent of public expenditure in connection with fourteen settlement projects assessed by Nelson. It is best to recognize such high costs from the start before asking in what ways they can be reduced. When cost reductions are then considered, a number of possibilities come to mind. These include location of settlement areas as close as possible to settled areas and major market centers and involvement of the private sector.

g. The Phasing of Infrastructure. The phasing of infrastructure has two major implications in regard to financing of new lands settlement. On the one hand, it can postpone certain major capital expenditures until a later time phase of the settlement process; on the other hand, it may provide a source of income for partially financing subsequent infrastructural investments.

h. Facilitating the Development of Existing Rural Towns. We have already noted the propensity of planners to create new rural towns from scratch, often with unsatisfactory results. Granted the undeveloped state of the art in the planning of new townships, it makes far more sense to stimulate the development of existing rural towns if such exist. Though no comparative data exists, I presume such an approach would also be significantly cheaper financially.

3. Feasibility and Planning Studies for Siting New Lands Settlements

Because new lands settlements are situated in relatively unknown areas there is no substitute for feasibility studies for considering possible development options and for planning studies to explore particular options in more detail. Such studies can be divided into two broad types, the first dealing with the physical and biotic environment and the second with the host and prospective settler populations. Time and again settlements are planned and

implemented without adequate information on the physical and biotic environment. Time and again a major reason for their subsequent failure or inability to realize their development potential is due to the failure to carry out appropriate climatic, hydrological, and soil surveys or to utilize available data. Socioeconomic surveys of the hosts should provide data on their numbers, their systems of land tenure and land use, their water rights, and, to an extent, their socioeconomic systems. Surveys of the numbers and lifeways of the host population are needed to establish the total population that will be impacted upon by a possible settlement project and to assess their attitudes toward being incorporated should settlement proceed. Studies of land tenure and water rights are needed to define host concepts of tenure according to customary law. It is fair neither to the hosts nor to the settlers to ignore customary tenure, since future land disputes can jeopardize the entire settlement process. As for the study of host systems of land (and water) use, these can yield invaluable information on the resources of the area and how to utilize them.

Information on prospective settlers has two major uses. First, it can provide data of use in planning and implementing the settlement itself. Second, it can provide information of how the emigration of a significant number of people from a particular locale can be used to facilitate the development of that locale.

C. PLANNING FARMING SYSTEMS

1. Introduction

Agricultural diversification in terms of the integrated planning of farming systems, fisheries, and silviculture is a rare feature of settlement projects. The same applies even to farming systems diversification, both in connection with diversification within a particular farming system and between farming systems. Throughout the tropics and subtropics, new lands settlements have been planned and implemented as agricultural production schemes based on a relatively small number of crops for export and domestic consumption in that order of priority. Yet diversifying agricultural systems and, more specifically, farming systems increases the development potential of new lands settlements. In the discussion that follows, the need for diversification must continually be kept in mind.

2. The Need for Research

There is no substitute for research for agricultural development. Simply because so little is known about new lands settlement areas, this must start at the earliest possible moment. Because most new lands settlement areas will be colonized by small

holders, agricultural research should be oriented toward the creation of more productive farming systems. While I am not suggesting that conventional crop research be deemphasized, I am suggesting that every research station should include an area which simulates in size and other conditions the different kinds of settler holdings.

Regardless of focus, all research programs both on the research station and in the field should be both comparative and longitudinal. Researchers should also be on the lookout for "breakthrough" possibilities which could significantly alter or even revolutionize small holder farming in existing settlement areas, and which could open up new agro-ecological zones for settlement.

To sum up, I am suggesting that agricultural research stations in new lands settlement areas not only place more emphasis on appropriate farming systems research, but also that they serve as the institutional base for carrying out a broader range of research relating to the development of agricultural systems. For example, serious consideration should be given to basing monitoring and evaluation activities at agricultural research stations, with the necessary facilities attached. Since effective extension must be research based, it also makes sense to place training facilities for both settlers and extension staff close to research stations.

D. PHASING INFRASTRUCTURE

A common characteristic of settlement agencies is their attempt to provide instant infrastructure from scratch. Not only is this a very expensive procedure but, also, it seldom works. For the majority of settlers, the first few years tend to be the most difficult. At that time the critical items of infrastructure would appear to include potable water and certain disease control programs, access roads, primary schools, and in the case of irrigation projects the timely completion of the irrigation infrastructure and of land preparation so to ensure the timely delivery of water in the right amounts to the settlers.

Since settler health tends to suffer during the initial years, a clean supply of potable water is a major need which, in fact, is rarely supplied.

All weather access roads service a variety of needs. First, they provide access not just for the settlers but also for a wide range of essential goods and services. If access roads are adequate, private sector entrepreneurs are more apt to move into the area to provide transportation facilities, and to built general stores and other retail outlets. Second, access roads provide exit routes. Their very existence reduces the degree of isolation for the settlers. Like access roads, the early provision of primary schools also

encourages settlers to bring their families and to remain in settlement areas during those initial years of hardship. As for the timely provision of water in irrigation based settlements, that is a crucial input which time and again has been delayed with very detrimental impacts on settler morale, departures rates, and relationships with the settlement and other government agencies.

From the settler point of view, the need is much less urgent to provide secondary schools, a hospital, postal and banking services, and other types of infrastructure during the first five years of the transition stage. Such items are far more important from the point of view of administrative staff and other government and private-sector nonfarm personnel. For them, however, it is both cheaper financially and quicker to upgrade existing facilities in established rural towns than to build new towns.

E. SETTLER RECRUITMENT AND POLICY

1. Introduction

Pioneer families tend to be relatively young, often with only one or two small children. Over the years family size can be expected to increase significantly, usually exceeding the national average in terms of the number of children. The planned size of the household plot should take into consideration the needs of this growing family unit, including the probability that in their old age the first generation of settlers will wish their heir to build on the same plot during the period of handing over.

2. Settler Mix

The global experience is that there are more than enough good candidates for sponsored settlement. The desired nature of the mix will vary between countries and from one agro-ecological zone to another. Generally speaking, in countries with large areas of under-utilized humid rain forests and with heavily populated old lands with a significant proportion of landless farmers, spontaneous settlers tend to outnumber sponsored settlers by three or four to one. The proportion of spontaneous settlers tends to be significantly less in areas with rainfall deficiencies during the main cultivation season.

If planners are aware of the history of spontaneous settlement within the different agro-ecological zones of a particular nation, obviously they are in a better position to forecast the possible response of spontaneous settlers to the opening up of new areas and, based on such estimates, to work out the settler mix. What the mix should be will also depend on other factors. Since financial costs per spontaneous settler family tend to be lower, this factor alone may

be significant — although a site and service approach to sponsored settlement can also reduce settlement costs. Another factor relates to whether or not sponsored settlers come from without the settlement area or are hosts. In the latter case, the global evaluation suggests that the best strategy is to incorporate them within the settlement area if they are willing.

A major conclusion of the global evaluation is that far more emphasis should be placed on facilitating spontaneous settlement and combining it with sponsored settlement as a mechanism to tap into the initiative of spontaneous settlers, to diversify settlement areas in terms of occupational specialization, and to cut the financial costs of the settlement process.

3. Recruitment

Where new lands settlements are a major development intervention, serious thought should be given to formulating a national set of recruitment criteria. While desirable criteria will vary, some generalizations appear valid. Of these perhaps the most important is to recruit settlers as families rather than as individuals. Another is to use a formal point system whereby both spouses are evaluated according to desirable criteria with recruits being those families with the highest number of points.

Time and again settlers are interviewed by sponsoring agencies or local leaders as if they did not have wives or families, and with little effort made to learn if wives wish to move -- and if they do, as to whether they have appropriate skills. Special planning is needed to correct this situation. As a starting point, it makes sense to recruit only families in which both spouses wish to become settlers. As for establishing a point system, not only does that require more careful thought about the relative merits of different criteria, but it also reduces the possibility of favoritism within the selection process.

Though it is far more difficult to generalize about the desirability of specific criteria, and very difficult to weigh them in relationship to each other, even here the global evaluation has led to some tentative conclusions. Most frequently emphasized are health, education, skills, background, and number of children. Granted the hardship associated with the initial years of settlement, good health is clearly important. On the other hand, the correlation between education and becoming a productive settler is not clear in spite of a good bit of attention to this factor in the research literature. Ideally, sufficient education to be able to read simple instructions and to keep simple accounts makes sense. Other than that, what appears to be more important than the number of years of education is the type of education and the expectations associated with being educated.

If new lands settlement is to initiate a process of integrated area development, obviously people must be recruited with both farm and nonfarm skills. This applies at all community levels, since even small settler communities need barbers, carpenters, masons, blacksmiths, curers, midwives, religious leaders, and other skilled personnel. Background relates more to occupational and class background. Throughout the tropics and subtropics, we found that sponsored settlers were overwhelmingly low income rural residents. In this sense, sponsored settlement is an effective mechanism for assisting low income populations.

The fifth criterion relates to settler family size and more specifically to number of children, a criterion with which most settlement planners are concerned. They are faced with a relatively difficult choice. While younger couples can be expected to be in better health, and hence more capable of dealing with the early rigors of settlement, older couples with more, and older, children will have a larger labor force of family members during those same critical years. One factor that tends to be ignored are the sociological implications of a settlement population which initially contains very few three-generational families and, in comparison to old lands, a very small proportion of older people. Assuming that a broader mix of people of different ages is desirable, planning consideration could be given to actively recruiting older couples to provide the necessary nonfarm occupational skills. Older women, for example, could be recruited as midwives and older men as carpenters, masons, and blacksmiths. Older couples could also be recruited as health practitioners and religious leaders.

4. Middle-Class Settlers

Periodically governments and settlement agencies have experimented with the recruitment of middle-class settlers, usually as a minority within a settlement dominated by lower-class settlers but occasionally within their own settlement. One or two reasons tend to be used to justify a policy incorporating middle-class settlers. The first is that they will make more successful farmers. The second is that they will provide leadership within the settlement.

There is no evidence that middle-class settlers make better farmers. On the contrary, what evidence is available suggests that yields per hectare generally speaking are lower on middle-class allotments than on peasant holdings within the same settlement.

As for providing leadership, the issue is more complex. Though Farmer (1957) notes that middle-class settlers in Sri Lanka "have on the whole done little or nothing to provide any form of leadership for nearby peasant colonists," small holders at Tahaddi (Egypt) told members of the Pacific Consultants team that graduates were useful in pressuring the settlement authorities to live up to

their responsibilities in terms of operating the irrigation system and providing inputs. At Way Abung, an Indonesian transmigration settlement in Sumatra, middle-class settlers had been instrumental in establishing a senior secondary school and other social services which were then available to all settlers. On the negative side, however, is the tendency for middle-class settlers to dominate positions of leadership not just on school boards but also within cooperatives and other production and marketing oriented settler organizations, becoming a new rural elite in the process which impedes the subsequent development of more broadly based settler organizations.

Against this background, there appears to be little justification for combining middle- and lower-class settlers in the same settlement. Rather settlements of small holders should produce their own leaders, a conclusion which Farmer reached in the 1950s after his analysis of settlement in Sri Lanka.

5. Exclusions

Though the evidence is overwhelming that new lands settlements benefit the poor, nonetheless exclusions occur on sociopolitical grounds. Most frequently such exclusions pertain to host populations, although they may also be more specifically ethnic. Though exclusions may be justified in some cases, these would appear to be the minority. Furthermore, where the hosts are excluded, future conflicts can be expected to threaten the viability of the settlement process. Though the international community of donors has the opportunity to at least question (if not influence) exclusionary policies, rarely have they done so.

6. Settler Homogeneity

Though governments continue to see new lands settlement as a mechanism for integrating and nationalizing a heterogeneous population, the evidence appears overwhelming that settlers prefer to live and work with co-ethnics and that ethnically homogeneous settler populations facilitate cooperation, reduce potentially disruptive conflict, and are a contributory factor to a shorter transition stage.

Cooperation is especially crucial during the early years of the settlement process when settler families often have to clear and prepare their land, build temporary homes, and plant and care for their farms under unfamiliar conditions. Self-help groups for alleviating labor constraints are formed more often among co-ethnics than among settlers from different ethnic groups.

While there is very good evidence to back up the recommendation that co-ethnics from the same locale be settled within

the same community, one advantage of large scale settlement is that there is room for a range of ethnic groups within the settlement as a whole. In terms of spatial arrangements, it makes sense for co-ethnics to be clustered around their own rural service centers. Mixing between adult members of different ethnic groups would then occur at the next level in the settlement hierarchy -- that of the rural town where their children, for example, would mix in junior and senior secondary schools.

7. Land Acquisition, Land Tenure, and Land Use

a. Land Acquisition. In terms of fairness to both hosts and settlers alike, land acquisition must be carefully undertaken before the first settlers arrive so as to reduce the incidence of subsequent land disputes. Even then, some disputes are almost inevitable. In spite of this, formal land acquisition and adjudication policies tend to be neglected by settlement planners until after conflicts occur.

b. Land Tenure and Land Use. No generalizations are possible as to the relative merits of individual versus communal control and cultivation of land. Rather the key factor is working out a form of tenure which provides sufficient security to the settler family to encourage members not only to maintain their allotment but also to make permanent improvements, and to develop a form of cultivation which the settlers support. Within these limits many possibilities exist -- including family cultivation and control of land, family cultivation and settlement agency control of land, family cultivation and communal control of land, and communal cultivation and control of land. There is little doubt, however, that the majority of settlers in the tropics and subtropics prefer family cultivation and control of land. So do the majority of settlement scholars who expressed themselves on this matter.

Settlement agencies, on the other hand, tend to shy away from granting titles to settlers (even where promised), preferring tenancy type arrangements based on annual or longer term leases which theoretically can be terminated at the discretion of the settlement agency. This preference for tenancy arrangements and for long term purchase options can be largely explained in terms of two government concerns. The first is a concern for maintaining certain agricultural production goals -- goals which the settlement agency fears will not be met if settlers have full title to their land. The second is concern that settlers will sell their land to speculators, hence interfering with social equity goals -- or they will subdivide it among heirs, hence interfering with production goals.

Both of these concerns appear exaggerated when compared with the problems associated with lack of settler security over land

tenure. Productivity, for example, is more apt to suffer where the settler has a disincentive to produce and to make permanent improvements because of tenural insecurities, while subdivision may occur because of inability to obtain credit -- many institutional donors requiring land title for collateral. Finally, on a disproportionate number of the more successful settlements, settler families own their land.

For such reasons as the above, settlement scholars tend to favor granting land titles to settlers. While they also suggest that safeguards be institutionalized to reduce land sales and subdivision, I suspect that the best measures are ready availability of credit and the development of nonfarm employment for absorbing the second generation.

8. Target Income and Settlement Pattern

Though target incomes need be carefully thought out in each case, a starting point for consideration is either the average national income per employed person or the average income per person employed in the rural sector.

As for settlement pattern, the general consensus favors a nucleated settlement. Although a dispersed pattern does not preclude integrated area development, as shown by the Northern Parana case, it does make it more difficult to provide a wide range of production oriented services as well as social services.

9. Size of the Household Plot

A strong argument can be made for not reducing the household plot below a size which can support various economic activities for various family members (especially the wife), which can accommodate some family livestock, and which will allow extra rooms to be added as new family members appear.

VII. BASIC ISSUES ASSOCIATED WITH STAGE TWO [The Transition Stage]

A. THE DROPOUT PROBLEM: ILLNESS AND INDEBTEDNESS

During the early years of settlement, it is not unusual for relatively large numbers of both spontaneous and government sponsored settlers to drop out. Though there is no quantitative data as to why settlers leave their new homes, case studies indicate a variety of reasons. Of these, misfortune appears to be a more common explanation than deficiencies on the part of the settler family. Two types of

misfortune are mentioned time and again. These are illness and indebtedness, with the first not infrequently leading to the second.

Indebtedness can occur for a variety of reasons, including illness and death, crop failure, such social events as weddings, and fiscal mismanagement. Because of the general absence of other forms of credit, indebtedness is usually to local moneylenders. Though their credit is better than none, it is usually provided at very high interest rates so that debtors may find it virtually impossible to meet their debt servicing responsibilities, with the result that they either sell out or have their land taken over by their creditors.

B. DEPENDENCY AND SUBSIDIZATION VERSUS PAYING FOR DEVELOPMENT

1. Dependency

While spontaneous settlers frequently suffer because of inadequate government assistance, the amount of assistance and the way in which it is delivered to sponsored settlers may cause them to become dependent on the settlement agency. Dependency is undesirable for a number of reasons. First, it delays the arrival of Stage Three and reduces the development potential of new lands settlement by curtailing settler initiative. Second, where settler organizations do form, there is the danger that their activities will be disproportionately concerned with settlement agency-settler organization relationships. Third, settler dependency increases the financial cost of settlement since the settlement agency must retain a large staff and continue carrying out a range of activities which could otherwise have been handed over to local management. The best way to avoid these disadvantages is to attempt to involve the settlers in settlement decisionmaking and management at the very start.

2. Subsidization, Food Aid, and Paying for Development

While subsidization of settlers should be kept to the absolute minimum at all times, during the initial years of settlement special assistance may be necessary. This is especially the case in regard to worker/settler programs where the settlers need shelter, water, and food while preparing the settlement area. It also applies to cases, of which there are many, where it is unlikely that settlers will be able to meet their food needs during the initial months or years of settlement.

In all such cases planners should carefully assess ways to help the settlers become self-sufficient at the earliest possible moment with the least danger of a settler-settlement agency dependency relationship developing. Special attention should be given to procedures which enable the settlers to plant customary food crops

while the official farming system is being developed. More often than not, however, governmental aid will be necessary until the first adequate harvest occurs. A number of options are available here including food aid (both national and World Food Programme), wage labor on the scheme, and subsistence allowances until settlers are self-supporting. Where there is a choice, in my experience government provided food for work produces the best results, provided it is distributed in a timely fashion. The trouble with a food allowance is that family health may suffer if there is insufficient food for local purchase prior to the first harvest, if food prices are seriously inflated, or if the allowance is spent for other purposes. As for wages, the risk there is that the settlers may come to see themselves as laborers on a government farm rather than as owner/operators preparing their future holdings.

While some form of food aid/wages/allowances usually are necessary for a while on sponsored settlements, other types of subsidization should be avoided wherever possible. As a general proposition, settlers should be taxed to the extent that at the very minimum they pay for recurrent project costs. Whether or not they can be expected to eventually repay the government for capital investment will depend on the nature of that investment. As for recurrent costs, these should be covered by land development and/or water taxes which are carefully explained to the settlers from the start.

C. ORIENTATION

Whether in the form of orientation or extension, settler training is one of the weakest aspects of government sponsored settlement programs. Orientation virtually never occurs; in fact, among our cases I am aware of only one where a carefully thought out orientation program has been executed which is separate from extension. This is the San Julian (Bolivia) settlement orientation program. Heads of newly recruited settler families are brought together to the settlement area where they work communally to prepare the land that subsequently they will cultivate as individual families, and to build family housing. Throughout the four-month period they receive orientation and special training.

D. EXTENSION

Throughout the tropics and subtropics the large majority of settlers are unfamiliar with their new habitat at the time of their arrival. Clearly if they are to avoid costly mistakes and a lengthy period of adaptation, both orientation and extension are crucial. We have already seen that orientation programs are virtually nonexistent in regard to new lands settlements. As for extension, of the thirty-six government sponsored settlements on which we have sufficient

information, in nineteen cases (53 percent) extension services were either nonexistent or minimal, and in only four cases (11 percent) were they good to excellent in quality (and in one of those cases they were inadequate in regard to availability). In regard to ten spontaneous settlements on which we have adequate data, on nine (90 percent) extension services were either nonexistent or minimal.

In spite of the fact that most government sponsored settlement areas are planned and implemented as agricultural production schemes, data from the global evaluation show that most of the necessary early inputs into the implementation of viable farming systems are absent most of the time. These include soil surveys and research based extension services.

Though there is no easy solution to the extension problem, some guidelines can be given. First, the advice extended must make sense economically as well as technically in the context of the settlers' farming system or systems. Second, advice must be presented to the settler family in a consistent fashion and in the right way. The logical approach to the second guideline is a unified extension service with one field agent responsible for advising settlers in regard to the entire farming system (with back up advice provided by specialized technical officers at the district, section, or irrigation system level). Presenting extension advice in the right way refers not just to how the extension agent approaches the settlers but also to the sex of the agent. A frequent planning weakness of new lands settlements is that planners are apt to put more stress on the farmer rather than on the farm family. Not only is the agricultural role of women apt to be ignored, but agricultural extension personnel often are exclusively male.

A third guideline relates to terms of service for extension personnel -- whose morale is frequently low because of inadequate salaries, inadequate opportunities for advancement, inadequate housing, and inadequate local transport.

E. COURSES FOR SETTLERS AND TRAINING COMMUNITY EXTENSION AGENTS FROM AMONG SETTLER FAMILIES

The British introduced farmers' training centers in their former colonies, while the French paid special attention to training unpaid village volunteers who were selected by their fellow village farmers. Both types of training are applicable to new lands settlements though the actual mix will depend on the nature of the settlement as well as on the nature of any orientation and extension programs.

F. LOCAL PARTICIPATION AND SETTLER ORGANIZATIONS

It is becoming increasingly clear that project success is associated with active local participation. In their Strategies for Small Farmer Development: An Empirical Study of Rural Development Projects, Development Alternatives (1975) stated as their primary findings that "to maximize the chances for project success, the small farmer should be involved in the decisionmaking process and should also be persuaded to make a resource commitment to the project" (Executive Summary:1). Generalizing for irrigation projects, Radosevich states that "at the local level, countries with the most successful irrigated agriculture have adopted some form of Water User Association" (1979), the effectiveness of which appears to increase where federated up to the irrigation systems level or within a river basin. Dealing more specifically with settlement, there is the impressive accomplishments of the San Juan flood refugees in Bolivia, whose local action greatly facilitated their settlement and served as a model for the San Julian orientation program.

Granted the lack of social integration which so often characterizes new lands settlements, settlement agencies should be prepared to facilitate the development of settler participatory organizations; indeed, the importance of these in terms of stimulating development and avoiding dependency is such that their creation should be built into the enabling legislation establishing settlement authorities.

Especially important are a wide variety of training programs for training leaders and staff of community farming associations, water user associations, and cooperatives. Here a word of warning is needed since there is a danger that such training programs may separate the trainee from his or her peers who subsequently view the trainee not as representing their interests but rather the government's. As for the scope of settler organizations which are encouraged by government and other agencies, it is especially important to not overload them with too many functions.

G. SHORT AND MEDIUM TERM CREDIT

The issue of credit is one of the most difficult policy issues associated with new lands settlement areas. Though there may be no correlation, nonetheless on settlement projects where credit is easily available through government channels, there is also apt to be a degree of settler dependency which may retard fiscal responsibility and initiative within the settler family. On the other hand, case after case shows that inadequate institutional credit can cause settlers to lose their land, especially following a wide range of misfortunes. In other words, there are special circumstances where

credit is needed if otherwise satisfactory settlers are going to survive as settlers.

1. The Type of Credit

For settlers, the primary need is for short term credit during the first few years, although medium term credit may be equally important where farming systems are based on animal traction. With most farming systems, however, the need for medium term credit increases as the focus of the settler family shifts increasingly from production for consumption to production for the market. This trend should not conceal the probability of an ongoing need for short term credit not just to deal with shortfalls in production and family misfortunes but also to deal with such seasonal activities as purchasing fertilizers and pesticides and recruiting labor for weeding, harvesting, and other activities.

As for small and medium scale entrepreneurs, their need is more apt to be for medium term credit to start up businesses, although small provisioners may need credit for replenishing inventories.

2. Individuals as Sources of Credit

A major function of local elites is to provide credit. Though they provide an important service here in the absence of alternate sources of credit, it is usually provided in a patron-client relationship which often enables the patron to profit at the expense of the client. Another noninstitutional source of funds, and one which should be encouraged since it helps develop fiscal responsibility, is the informal rotating savings association or tontine.

3. Institutional Sources of Credit

There are many possible institutional sources of credit, which can be divided into four general types. These are settlement agency sources, other government agencies (such as agricultural banks and agricultural finance corporations), private banks, and settler organizations.

a. Settlement Agencies. Though one of the more reliable sources, settlement agency credit is not without its problems. First, it tends to be tied to a limited number of cash crops in which the settlement agency has a major interest. Often these are export crops, with the ready availability of such limited credit interfering with farming system diversification. Second, the credit may only be available for a limited range of activities. Third, restrictions on availability, or on funds, often curtail the credit to a relatively

small proportion of settlers even in project areas with a major credit component. Fourth, the ready availability of credit through centralized or even decentralized settlement agencies can increase settler dependency at the expense of settler initiative.

In spite of such limitations, settlement agencies are a crucial source of credit during the start-up period of new lands settlements, when other types of credit institutions are either hesitant to become involved or, in the case of settler institutions, are not yet sufficiently organized.

b. Other Government Agencies and Private Institutions.

Throughout the world a variety of national government agencies make available credit to small farmers. The main limitations associated with such credit are the lengthy bureaucratic procedures which the settlers must follow and the limited funds available. Whether in the form of cash or kind, the credit may be received after the deadline for its use. The possibilities for involving private banks in credit programs for new lands settlements are greater than usually realized, with the result that they are an underutilized source of funds. Private banks tend to hesitate to become involved with small holder agriculture for a variety of reasons, including lack of collateral to secure a loan, the administrative costs of processing many small loans as opposed to a smaller number of larger ones, and low repayment rates. There are imaginative approaches, however, which can be used to solve these problems such as providing loans only to settler organizations rather than to individuals. In Sri Lanka, Hatton National Bank, Ltd. has been given a monopoly on supplying credit to small holders in H-5 on the basis of an earlier experiment during the 1970s whereby they provided credit to farmers on a small scale settlement.

c. Settler Organizations. The global evaluation suggests that one component that not infrequently is associated with more successful settlement areas is settler organizations which provide credit for their members. Possibilities include savings and thrift associations, cooperatives, water user associations, and community farm associations.

4. Interest Rates

These must be attractive enough to secure the participation of private banks and ensure the fiscal viability of other institutions allocating credit. What evidence is available suggests that settlers are willing and able to pay such rates, especially if we bear in mind their willingness to receive credit from individual moneylenders at much higher interest rates.

A word of caution, however, is needed here which once again emphasizes the initially poor information base dealing with new lands

settlement areas and the high exposure to risks from crop failure during the first few years. Such risks need be more carefully calculated by planners. Where they are especially high, the need may be more for a food aid program during the first few years than a major credit program, although again some settlers will need credit to cope with such special circumstances as the severe illness of the family head.

5. Repayment

Repayment rates tend to be better where settlers are required to market their crops through the project and where incentives to do so are high enough to forestall the development of too large a black market. Repayment also would appear to be better where loans are given through a settler organization which vouches for loans to members.

In sum, data from the global evaluation supports the Development Alternatives conclusion that factors associated with a good repayment rate include "group rather than individual credit liability; and compulsory marketing through an organization established by the project" (1975:24). Under such circumstances, however, it is important that credit be available for farming systems diversification rather than just for one or two crops.

6. Eviction of Settlers

Even where careful recruitment procedures are followed, inevitably some settler families will prove to be unsatisfactory farmers. This should be anticipated, with minimum standards of adequacy carefully worked out and explained to settler families as they are recruited.

VIII. BASIC ISSUES ASSOCIATED WITH STAGES THREE AND FOUR [Economic and Social Development; Handing Over and Incorporation]

A. MANAGEMENT

1. Introduction

A major conclusion of the global evaluation is that new lands settlements cannot stimulate a process of integrated area development without major external assistance -- the lack of such assistance being perhaps the major reason why spontaneous settlement has been so unsuccessful as a development intervention. The primary source of such assistance is government agencies.

Having emphasized the need for government assistance, it is also important to emphasize that inadequate government assistance and management capabilities may also become the major constraint facing settlement development. Partly for this reason it is important to stress the need for combining government initiative with local participation, and with private sector and private voluntary organization cooperation. Creating viable new lands settlements is a complicated ongoing task, with case after case indicating that where government agencies attempt to go it alone, they are apt to become a constraint on the very development that they are supposed to foster.

2. Centralized and Autonomous Government Management Agencies Versus Coordinating Agencies

The conventional wisdom is that large-scale settlement projects are best carried out by autonomous specialized or national settlement agencies. While such centralized agencies are parastatals established outside the normal departmental structure through special statute, coordinating agencies tend to be incorporated within a particular government ministry or department.

a. Parastatal Management Agencies. In theory parastatals have the flexibility to plan, implement and manage through time the complicated components associated with settlement and integrated area development whereas government departments do not. At least at the beginning they also are apt to have considerable political support which is translated into funds, personnel and influence. Powerful autonomous agencies are also in a stronger position to lobby for additional resources and to protect settlers against outside interests. To attract staff such agencies also tend to offer higher salaries, hence achieving better staff quality and continuity.

Though the strengths of parastatal settlement agencies have received considerable emphasis, less attention has been paid to their weaknesses. Three types of weaknesses, linked to an extent, appear with relative frequency. The first is an increasing inability to service the settlement area as time goes by, while the second relates to poor relationships with other government departments. The third relates to an inability to hand over managerial responsibilities to settler organizations, rural and municipal councils and other government agencies. This tendency to resist devolution increases the risk that the settlement bureaucracy will become more inefficient as the years go by, especially if political influence wanes with time, so that financial resources are cut and the better staff seek more rewarding job opportunities elsewhere.

While there are no easy solutions to the weaknesses outlined above, two types of approach exist -- the one political and the other based on budgetary inducements and constraints. Both have the same

goal -- to force parastadal settlement agencies to share power not just in the interests of efficiency but also in terms of facilitating integrated area development.

While political pressure from settlers does not appear to be an effective mechanism at this point in time for pressuring parastadal settlement agencies into handing over more managerial responsibilities, budgetary inducements and constraints would appear more promising. Budgetary constraints, for example, could be built into annual reviews in such a way that certain funds would not be allocated if it appeared that insufficient effort was being made to honor timetables relating to handing over and incorporation goals. The international community of donors could apply pressures here by allocating funds to appropriate institution building and training programs for local organizations, by more carefully monitoring their use, and by justifying different approaches on the basis of experience elsewhere.

b. Coordinating Settlement Agencies. The main advantages of using an existing government department to play the lead role in coordinating the settlement process relate to the later stages of the settlement process, and especially to handing over and incorporation. Both actions are less of a problem simply because the various departments being coordinated are usually the ones to which an autonomous settlement agency would hand over responsibility.

The weaknesses of using an existing department or ministry to coordinate the development of a new lands settlement relate to problems of flexibility and of influence. As Dalton (1981) has pointed out for area development projects, the coordination of complex development efforts involving many agencies is an incredibly difficult task demanding "an enormous and steady series of efforts directed at fostering communication and understanding among policymakers, technocrats and technicians", not to mention politicians and leaders of local organizations.

Two types of solutions to the above weaknesses suggest themselves, the first being institutional and the second budgetary. At the national level, the coordinating agency's influence and political clout could be enhanced if the coordinating committee reported directly to a prominent cabinet subcommittee or even directly to the vice-president or president himself. As for the local level, clearly local government agencies should be involved along with the participating government departments while at the district level, the senior district political official in most cases would be the logical person to chair the coordinating committee.

As for budgetary solutions, here funds could be allocated to the coordinating agency to "encourage" participating agencies to carry out activities that fall within their sphere of influence but which

they may have neither the motivation or the staff, equipment and finance to carry out.

B. MARKETING FACILITIES AND SETTLER RUN COOPERATIVES

Marketing facilities include appropriate handling and storage facilities on the settlement and transport from the farm to the market either direct or via government or private sector marketing agents.

Sponsored or spontaneous, marketing inadequacies are associated with the majority of settlements on which we have data. Whether related to availability or cost, frequently these are associated with inadequate feeder and settlement access roads, with the result that the settlers have to pay exorbitant prices to marketing agents to pick up their crops at the farmgate, have to hire laborers and transport to carry produce to the nearest government or cooperative depot, or have to use their own labor and transport.

In discussing possible solutions to marketing inadequacies from the settlers' viewpoint, it is important to emphasize that private traders, like money lenders, provide an invaluable service -- at a high price -- in the absence of other alternatives. Granted the complexity of the settlement process, and the difficulty of government sponsored agencies providing, at a lower price, equally efficient services, settlement planners should seriously consider providing alternative options to settlers as opposed to a strategy which attempts to give government marketing organizations a monopoly from the start by excluding both private traders and settler organizations.

While some government marketing organizations are very efficient, the majority may well be counterproductive in terms of new lands settlements initiating a process of integrated area development. There are three reasons for this. First, concentrating on one, or a small number of crops, such organizations act as a constraint on farming systems diversification. Second, while often evening out price fluctuations, prices offered settlers tend to be low -- government marketing boards being a major mechanism whereby farmers are "taxed" to subsidize the development of the urban-industrial sector (Bates, 1981). Third, they are often highly inefficient, with delayed pickup of crops and delayed payouts.

Effective solutions to marketing problems often must provide not just prices, marketing facilities, and pickup and payout schedules which meet settler needs, but also help remove other constraints which increase settler dependency on private traders. Credit is a case in point.

Although a number of cases, including the Northern Parana one, indicate that the private sector can provide adequate marketing

services without competition from government and settler run organizations, we have argued throughout that settler participation is associated with project success. The emergence of settler run cooperatives is a major way to foster that participation. Indeed, during the global evaluation we came across a number of efficient settler run cooperatives which were able to outcompete private traders by offering members a better price and a range of other services.

C. ECOLOGICAL IMPACTS OF NEW LANDS SETTLEMENT

Of special concern is the replacement of highly diversified humid tropical rainforests with less productive cropping systems. Especially serious in Latin America because of the emphasis placed on conversion of humid forest to grassland for ranching, the elimination of primary rain forest is also occurring at a rapid rate throughout tropical Asia and in West Africa. Of concern is not just the removal of the forest cover but also the techniques being used for land preparation, with mechanical clearance more apt to remove the top soil and cause adverse compaction than hand clearing.

Another problem in the humid tropics as well as in savanna environments is declining soil fertility occurring over both the short and long run. In arid and semi-arid lands, adverse ecological impacts are more apt to relate to problems of salinity and water logging, coupled with declining fertility. A major problem relates to inappropriate farming systems for each agro-ecological zone. In terms of corrective action, a good starting point is the more diversified farming systems of host populations which are characterized by multi-cropping and interplanting, with both leading to a more intensive form of land use which is not carried out at the expense of soil fertility.

D. RESEARCH

Many of the conclusions in this study are based on a relatively small number of studies. They need testing against the results of further research. There is a special need for farming systems research, for research on the multiplier effects of new lands settlements, and for research dealing with the later stages of the settlement process.

There is a special need for experimental research, for topical research, and for long-term comparative research. Of these three general types, experimental research will deal in large part with appropriate farming systems. It should be based at agricultural research stations, provided the linkages to universities and other research centers exist to ensure that such research is not restricted to agronomic and technical components alone.

As for topical and long-term comparative research, a strong argument can be made that at least part of this research should be carried out by settlement agencies themselves.

IX. AN IDEAL SETTLEMENT PROCESS

Government sponsored settlement has a yet to be realized potential to catalyze a process of integrated area development in carefully selected portions of the tropics and subtropics. For while planners overestimate the magnitude of rates of return during the first five years, they underestimate the long-term potential. This potential relates to both irrigation-based and rainfed farming systems. In stating this I do not wish to give the impression such potential will be easy to realize. The majority of government sponsored settlements cannot be considered a success in terms of either direct or indirect benefits. Furthermore, they are fraught with problems for the settlers who are the major risk takers. For example, of forty sponsored settlements on which we have sufficient data, the majority were characterized by three or more major problems at the time of study, major problems including such factors as settler dependency; on-farm problems due to poor soils, lack of fertilizers and credit etc.; inadequate infrastructure; and institutional problems relating to inadequacies on the part of the settlement and other government agencies.

Such problems are not easily solved especially by government organizations with annual funding and relatively short-term horizons. But they are not intractable. For that reason they should be amenable to solution through more careful planning, implementation, management and evaluation.

The paragraphs that follow outline the distinctive features of an ideal settlement process. This is not presented as a new prototype or "model" to be superimposed on a particular area. Rather it represents a composite, based on features -- drawn from many settlement experiences -- which would appear to increase the possibility for success. These features have never been combined in a single case so that little can be said about how they would fit together and evolve through time. Furthermore, because of the distinctiveness of national ideologies and development policies, of the background and experiences of prospective settlers, and of the differential nature of agro-ecological zones, some features of the composite would be inappropriate. Notwithstanding these cautions, we know enough now about the settlement process that the presentation of a ideal settlement "model" can help national and international policymakers and planners, administrators, settlers and other settlement participants improve the planning, management, implementation, and evaluation process. At the very least, planners should consider the appropriateness of the "ideal" and not introduce major variations unless these are based on convincing reasons.

The major goal of an ideal settlement process is to catalyze a process of integrated area development with growing linkages between the agricultural and the industrial sectors within the settlement area. Though initially the settlement population numerically is dominated by settler families, as the settlement area evolves the proportion of farm laborers and of nonfarm workers increases until eventually nonfarm workers employed in rural service centers, rural towns, and urban areas predominate. To reduce financial costs and the type of organizational inadequacies which so often dominate sponsored settlements, careful attention should be paid from the start to the proper balance between settlers and other settlement residents, the private sector, and the public sector in the provision of inputs required for settlement success.

To realize such a goal, settler families must number in the thousands. Appropriate farming systems should be sufficiently diversified to provide economic opportunities to all family members to realize a net income high enough to stimulate demand for a wide range of production and consumption goods and services which can be locally provided, and to produce a variety of agricultural commodities for meeting the food needs of farm laborers and nonfarm workers, and for stimulating the emergence of agro-industry. Within the farm system, special emphasis should be placed on the crop and livestock but not the off-farm components.

From the start there should be major government involvement, with very careful attention given to how government inputs can be best provided through time in terms of organizational structure. Where a special or national settlement agency is involved, mechanisms should be built into its enabling legislation or terms of reference which not only encourage the handing over at appropriate times of certain managerial and other functions to the decentralized departments of relevant ministries, rural and municipal councils, and local and participatory agencies, but also include fiscal and other mechanisms to insure that such handing over occurs. Where a decentralized form of administration is established with one agency responsible for coordinating the activities of other agencies, that agency should report to a high enough authority (a council of ministers, perhaps, or the vice president, prime minister, or even president) to ensure compliance from other cooperating agencies in the achievement of clearly stated settlement goals.

Thorough planning should precede implementation, with feasibility studies including climatic, soil and hydrological surveys of potential settlement areas, and socioeconomic surveys of the land tenure, land use, and sociocultural systems of the host population. Once specific settlement areas are selected, more detailed soil, hydrological and host-oriented studies should commence, and appropriate agricultural experiment stations, with a farming system (as opposed to a crop specific) orientation, should be established.

The settlement type should attempt to include host, spontaneous, and government sponsored "outsider" settlers not just as mechanisms to provide opportunities for all three populations and to tap into the enterprise and initiative of the spontaneous settlers, but also to cut the financial costs of the settlement process. For settler recruitment, both spouses should be interviewed and settlers with a mix of farm and nonfarm skills should be selected.

All types of settlers should be encouraged to settle in nucleated communities in which household plots are large enough for women to grow vegetables and fruits and raise some livestock and for the second generation heir to build a home next to that of his/her parents. These communities should be articulated to a carefully planned and hierarchically organized network of higher order service centers and townships which should incorporate existing commercial centers wherever possible, and which should be planned with the needs of both settler and nonfarm resident (including government officials) in mind. Orientation courses for at least a minority of settlers (with some drawn from each community) should be undertaken as soon as possible after the arrival of each phase of settlers.

The provision of infrastructure should be phased, with initial emphasis on roads; potable water (and water for irrigation where relevant); preventive medical services (malarial control, for example); appropriate research-based extension advice; and credit. Generally speaking, settlers should be responsible for building their own houses, although in certain agro-ecological zones it may be necessary for government to stockpile local building materials. Throughout, initial government inputs should be targeted to achieve economic and social viability of settler communities at the earliest possible moment so as to facilitate the shift from the second stage of transition to the third stage of socioeconomic development.

Economic assistance should have priority over social infrastructure and housing — while the provision of such social infrastructure as schools, clinics and other community services should have priority over housing, which is best left to settler initiative. Under economic assistance I have selected out roads, research-backed extension services, and credit for special emphasis during the initial years because of their inadequacy, time and again, in settlement planning and implementation. Properly maintained access roads are crucial not only to move inputs into the settlement area and produce out of it, but also to reduce the sense of isolation from the point of view of the settlers. Appropriate research-backed extension advice is needed for both production related and ecological reasons, while credit is crucial from the start if the failure or "drop-out" of settler families and the risks of land consolidation in the hands of a few are to be reduced.

There is increasing evidence that production increases and project success in connection with rural development is closely correlated with the participation of local beneficiaries in the development process. For this reason, special emphasis need be placed on how best to involve the settlers in the preparation of the lands that subsequently they will be farming and to facilitate the emergence of settler dominated local organizations during the early years of implementation. In the case of such organizations as water user associations, community organizations, and cooperatives, these should be encouraged to federate up to the project level so as to increase their capacity not only to organize community labor for development purposes and to express settler needs but also to enable the local population to compete more effectively for scarce resources at the district, regional, and even national level.

Though marketing facilities usually are not crucial during the initial years when many settlers are struggling to achieve self-sufficiency, they become crucial as soon as settlers begin to produce for both local, regional, and national markets. As defined here, marketing facilities include those for both storage and transportation. These can be provided by a wide range of organizations, the exact nature of which need be worked out in each instance. The need for market centers right up to the level of the regional town increases as the settlers begin to shift from a Stage Two to a Stage Three orientation. At that time implementation of a policy to develop rural service centers and rural towns should be accelerated through such mechanisms as the provision of credit for business loans. At the same time, efforts should continue to make rural towns attractive places to live not just for the owners of commercial enterprises and their employees but also for settlement agency and other government officials. This can be done through the construction of appropriate housing (in contrast to the policy for settlers) and the phased upgrading and provision of educational and medical facilities, post and banking services, and recreational opportunities -- with the upgrading of existing commercial centers favored over the construction of new towns wherever possible.

General prescriptions become more difficult as the settlement area evolves, with the dynamics of the development process becoming more complicated. As more and more factors come into play, with ongoing shifts in their proportional importance, policy prescriptions which are not based on an ongoing process of monitoring and evaluation become more difficult. But a capability for carrying out ongoing monitoring and periodic evaluations should be present from the start since the identification and solution of one set of problems in itself can lay the basis for new problems. As the settlement area evolves, new constraints and strengths can be expected to continually arise. Rural/urban terms of trade at the national level may shift in such a way that they effect the settlement area either adversely or favorably. New health hazards (such as schistosomiasis in the case of irrigation projects) may sap settler vitality, while the proliferation of rats,

wild pigs, and a wide range of insect pests; the appearance of new diseases of crops and livestock; and major environmental changes (owing to increased land degradation and riverine siltation, or to an increased incidence of frost or drought) can bring on major setbacks. Though monitoring and evaluation cannot be expected to identify all problems before they reach critical proportions, properly done it can easily pay for itself in terms of what problems are identified and then acted upon in a timely fashion.

One function of monitoring and evaluation is to ascertain the appropriate time for handing over certain managerial responsibilities from the settlement agency or agencies to settlers and local government institutions. This, of course, requires monitoring and evaluating the capabilities of those institutions -- with weaknesses identified so that they can be offset by appropriate training and other assistance, and strengths also identified so that they can be built upon. Though aspects of centralized management may have to continue where settlement is part of large-scale river basin development projects or major systems of irrigation, this is not necessarily the case even there. It is still less necessary during Stage Four in the case of settlement based on rainfed systems of agriculture.

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