Agribusiness and Rural Enterprise
Project Analysis Manual

FACTORS FOR ESTIMATING TARGET GROUP SUCCESS

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For:
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International Development
Development Support
Office of Agriculture
Agribusiness Div.
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AGRIBUSINESS AND RURAL ENTERPRISE

PROJECT ANALYSIS MANUAL

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CHAPTER ONE: EXECUTIVE SUMMARY

Introduction

The last decade has seen many changes in the focus of development programs and policies. A.I.D. and other international donors have become increasingly concerned along with most developing countries about the distribution of the benefits of economic growth. This focus has brought with it increased concern for rural employment which has in turn led to expanded interest in agribusiness and small scale rural enterprises. Agribusinesses (which include the processing of food and fiber products, agricultural marketing services and agricultural inputs) and rural enterprises of all types have recently received substantial attention as sources of increased rural employment and income. Not only can these activities provide income and employment directly, but perhaps as important is the indirect impact they have on small farms from which they purchase produce and to whom they provide inputs. Agribusinesses and rural enterprises occupy an important intermediate position between farms and consumers and their development can be a key factor in transforming rural development at all levels.

Much of the recent emphasis in development assistance thinking has been related to the apparent conflict between "growth" and "equity." One of the most important potentials of the agribusiness and rural enterprise sector is in providing growth possibilities without an equity conflict. Labor intensive, small scale and relatively efficient enterprise systems exist in most countries and their expansion has favorable impacts on the income and employment of the rural landless and nonfarm poor as well as favorable linkage to the small farm sector. While all of these potentials exist they are not simple to unlock; care must be taken in project identification, design and implementation in order to achieve important contributions to both growth and equity. Much is yet to be learned about the agribusiness and rural enterprise systems in developing countries and how to provide development assistance in successful ways. The purpose of this manual is to provide an overview of what is known about the role of these activities as it relates to A.I.D. project possibilities and then to outline project analysis methods for the identification, design, monitoring and evaluation of development assistance projects in this area.

A. Guide to the Use of the Manual

1. Purpose of the Manual

The purpose of the manual is to provide A.I.D. project personnel with background and project analysis methods for agribusiness and rural enterprise projects.

2. Use of the Manual

The manual is written for three types of A.I.D. project personnel, and three corresponding levels of detail are presented. The first group is project design, implementation, and/or evaluation personnel who are or may be

working directly with agribusiness or rural enterprise projects. For these direct project personnel, the manual and its technical footnotes should be useful both as a guide and as a reference. In those cases where the manual is unable to pursue a particular topic in sufficient detail to guide practitioners because of space limitations, the footnotes and bibliography usually suggest further references. For project personnel involved directly in design, implementation or evaluation of agribusiness or rural enterprise projects, the manual was designed to be read in its entirety, including footnotes

The second group of potential readers is A.I.D. project personnel who are involved only part time with agribusiness and rural enterprise projects. This would include central A.I.D., regional bureau personnel, and mission officials involved in project review. For this group an understanding of methodology and technical detail is less important. The manual was designed such that this group could obtain the necessary level of awareness by omitting the footnotes; almost one-third of the total material presented in the manual is contained in the technical footnotes.

The third group includes A.I.D. or other development agency personnel who have only a peripheral interest in agribusiness and rural enterprise projects. The executive summary was written especially for this group and presents an abstract of the main ideas of each chapter.

Readers who choose to read only the executive summary are cautioned that its brevity carries important dangers. It fails to provide analytical balance in that it tries to present the strongest but not the only reasonable position on many issues. It makes statements without supporting evidence and discussion which are contained in the body of the manual itself. The summary gains economy and brevity at the risk of oversimplification of a complex and difficult subject.

For those who would like to obtain a slightly increased understanding of the subject beyond that provided in the Executive Summary, Chapter Four is recommended.

The manual is intended to be a management oriented guide; it does not attempt to provide a comprehensive review of existing literature and research, but rather to select inside that literature useful examples which will either provide an overview of the field (Part I) or illustrate viable project analysis methods (Parts II-IV). The authors have had direct experience with agribusiness and rural enterprise project design and evaluation and have attempted to provide materials which will be useful to A.I.D. practitioners.

A manual is difficult to design which can satisfy the generally interested reader and the practitioner alike. When one is directly involved in conducting a cost benefit analysis of a project, for example, his level of interest in exploring the technical detail related to the task at hand is great. The manual attempts to strike a balance between these varying levels of interest. While it does not provide a project analyst with the necessary detail at the "cook book" level to teach and guide to successful completion, it does intend to provide the A.I.D. project manager with the necessary understanding to write a satisfactory scope of work for a project analysis, and the background necessary to be an adequate monitor of a contractor engaged in project analysis. The manual is intended to equip A.I.D. project personnel with sufficient skills and background that they can systematically "manage" the specialists involved in project identification, design, implementation, and evaluation. This is simply another way of saying that the manual is oriented to the A.I.D. manager and not the subject matter specialist.

B. Part I: Overview of Agribusinesses and Rural Enterprise Project Setting

1. Private Sector Approach

Almost all agribusinesses and rural enterprises in developing countries are in the private sector. A.I.D. projects in this field must enter at some stage into this private sector system. Public sector banking channels, technical assistance organizations, and research capability may be critical to project success, yet the projects are basically private sector oriented. Unlike agricultural technology which has been substantially developed and disseminated through public channels, the small scale and large scale technologies which can be drawn upon for agribusiness and small scale rural enterprise development have largely originated and become perfected in the private sector.

The central focus of most of this manual, and indeed of most A.I.D. projects in this field to date, is on assistance to indigenous small scale enterprises in rural areas or in urban areas but related to processing or distributing agricultural products. Larger scale enterprises which process labor intensive agricultural products and which link directly to small farmers are also included.

U.S. agribusiness can play a vital role in this process by providing training, risk capital, technology transfer and market connections in many cases to indigenous enterprises; however, this manual is not designed to be directly useful to U.S. businesses interested in developing projects of this type. Harmonizing the interests of U.S. agribusiness and indigenous enterprises presents significant potential in certain products which are characteristically labor intensive.

2. Growth with Equity

Agribusiness and rural enterprise projects hold significant potential for promoting growth with equity. Many of these activities are labor intensive, owned and operated by target group families, provide employment and income for landless rural populations, and at the same time are relatively efficient. The resource use efficiency of many of these enterprises implies that scarce capital resources will be appropriately expended in these projects from both "growth" and "equity" points of view.

3. Agriculture Sector Linkages

The rural economy in LDCs is an interknit system. Farms, small scale enterprises, commerce, and services operate in an integrated fashion whether or not a money economy predominates. Growth and development in this system also take place in an integrated fashion. This does not necessarily imply that each subsector will grow at an even pace. Growth may stem from an initiative in a single segment of the system and spread unevenly to other components of the rural economy.

Agroindustry and rural enterprise interventions are located in the middle of this backward-to-agriculture and forward-to-final-consumer system of linkages. These interventions are ideally situated to draw the system more closely together, to pass more evenly the growth potentials of one segment of the rural economy to the others, connecting potential producers with final markets.

Agribusinesses (both small scale rural and large scale urban and rural enterprises) utilize farm and rural products as their major raw material inputs. Expansion of these industries will have important impacts on the suppliers of these inputs.

4. *Public Policy*

A considerable public policy structure participates in framing the environment within which Small and Medium Scale Rural Enterprises (SMRE) function in any country. The policy setting (including the lack thereof) must be a part of the knowledge base with which the project planner avails himself prior to further identification of alternative project interventions.

Policies of obvious concern to the project planner are those that are targeted directly to SMREs, and impact either negatively or positively on viability and potential for growth of the subsector. Others that are not quite so obvious, but nevertheless affect the climate within which SMREs operate are: 1) general economic and trade policies that directly or indirectly affect the economic climate within which SMREs compete for raw materials, factors of production, and markets; and 2) policies affecting other subsectors strongly linked to SMREs as suppliers of inputs or purchasers of outputs.

a. Credit Policy

Credit is a tool by which adjustments in all factors of production can be achieved. Thus, public policies affecting the availability and conditions of credit and capital supply to SMREs and agroindustry are particularly important.

In looking at credit policies, it is important to examine not only those policies that seek to make credit accessible to SMREs in acceptable terms, but also those policies which access large-scale enterprises to supplies of capital (often at subsidized interest rates) that generally cannot be tapped by smaller rural enterprises. Capital markets in less developed countries often are not well developed, being generally limited to the capital city in smaller countries, and generally not reaching beyond major regional centers in larger countries. Although bank branches may exist in more remote areas, they generally exist primarily as depositories for funds and to facilitate noncredit transactions between the hinterland and the capital city.

In many cases, large scale enterprises have access not only to major national capital markets, but to international capital markets as well. In addition, special government industrial promotion programs often provide special lines of credit at subsidized interest rates. Such programs usually are administered from one office in the capital city or a limited number of offices in other major commercial centers. Paperwork generally is substantial and insurmountable for many SMREs. Because of geographic isolation and the sophistication required to access these special lines of credit, SMREs are not benefited by such programs, although they are not formally excluded. Their situation can be characterized as one of "benign neglect." Nevertheless, the net result of such programs often can be negative for SMREs, since they enhance the relative competitive position of larger-scale enterprises.

The point is that credit should not be looked on as one of the **essentials** of SMRE development, as are availability of raw materials, markets for output, managerial capability, etc. If these **essentials** do exist, then credit may **accelerate** the growth of SMREs, if the potential exists. Rural entrepreneurs may not lack capital or credit so

much as the motivation to use resources to develop their enterprises. There is ample evidence that credit programs for small businesses often can be wasteful of funds, or even counterproductive.

Despite the pitfalls, credit may be an important component of a project intervention aimed at assuring that the essentials to successful SMRE growth and development are in place. Credit policies then become important variables to be taken into account by the project planner.

Many specialists have marshalled impressive evidence that subsidized interest rates may be self-defeating in terms of making credit effectively available to these target groups. It should be kept in mind that if the profitability of the credit investment depends upon a few percentage points of interest, the investment probably is not sufficiently profitable to justify the use of credit in the first place. The most telling argument in favor of charging true interest rates is that economic viability of the lending institution cannot otherwise be sustained. Even in the case of a state lending institution, the government is not likely to continually replace the capital of a subsidized credit fund, and it will eventually become depleted.

b. Agrarian Reform and Agricultural Policy

An obvious need for the SMRE subsector is raw materials and markets. The skewedness or absence thereof in the distribution of productive wealth in rural areas obviously has an impact on the local availability of raw materials from agricultural production and the size of the local market. In cases where land previously held in absentee ownership, or previously concentrated in large units, is distributed to the former landless laborers or sharecroppers, disposable incomes in the local area may increase even if output does not increase (or even declines somewhat). This is because more of the total agricultural income is retained by local people and expended in the local area rather than being expended in the capital city or outside the country. Thus, an agrarian reform that results in nothing more than income transfer can be expected to increase local demand for goods and services. If productivity increases also are achieved as the result of programs supporting agrarian reform, the increase will be even more substantial. This results in an economic climate that should have a positive impact on SMREs that provide goods and services for local consumption.

c. Labor Laws and Employment Policy

Labor laws that impose minimum wages and relatively high levels of fringe benefits are common in LDCs. Where these encompass SMREs, they can seriously limit ability to maintain viability and expand. In many cases, such labor laws exempt enterprises under a certain size; e.g., with less than five employees. Exemptions set at low levels may be an important disincentive to expansion by SMREs, even where other factors are favorable.

d. Internal Fiscal and Tax Policies

Nationally administered property and income taxes probably do not impact negatively on smaller rural enterprises in most LDCs. Small enterprises often are specifically exempted from business taxes because of their size or organizational form and tax administration may be inadequate to monitor any but large business enterprises.

e. *Industrialization, International Trade Policy, and SMREs*

Often industrialization has viewed the SMRE as part of the backward, traditional sector which was to gradually diminish in size as the modern sector expanded, so no concrete attempts were made to subsidize them either. SMREs have been affected negatively by the import substitution policies in many cases. The high level of protection of infant industrial firms, for instance, provided a monopoly power to some local industries, resulting in SMREs having to pay monopoly prices for their inputs from such industries or in having to receive monopsony determined prices for their output sold to such companies. Direct and indirect subsidies had the effect of encouraging capital-intensive and import-intensive activities and techniques to the prejudice of SMRE production which tends to be more labor-intensive and intensive in the use of local resources. The whole industrialization policy resulted in a disproportionate direct and indirect taxation of agriculture through such mechanisms as discriminatory subsidies, overvaluation of the exchange rate, high tariffs on imported agricultural inputs, export taxes on agricultural exports, price controls of agricultural goods to subsidize local food consumption, etc.

By the mid-1960s, criticism of the import substitution strategy was widespread as it became evident that equity considerations such as employment and income distribution were little impacted by the growth oriented industrialization approach. Out of this criticism emerged two separate strategies—that of export promotion and that of small and medium scale enterprise development. While the former preceded the latter, which is just coming into its own, they bear similar objectives, and in some cases are intimately related, although this relationship has not generally been given sufficient attention. For many SMRE products the local market does not offer any significant opportunities to SMREs if they want to expand their production or to new SMRE firms wishing to start up. To some of these firms, exporting will offer the only viable way for some SMRE activities to grow.

There are many raw and processed agricultural goods for which the LDCs have a comparative advantage because of their labor-intensive requirements, and for which the income elasticities of demand are high, especially in the developed countries (e.g., vegetables, certain fruits, and oilseed plants) which can be successfully exported in competition with developed countries. The entry problems for SMREs are obvious. Quality differences and low quality production are common characteristics of SMREs. A SMRE will not have access to information regarding adaptation requirements of the foreign market, nor can it afford the high fixed costs of entering the foreign market alone, and an exporter will have little interest in dealing with a sole SMRE. These problems are surmountable, however, through appropriately designed interventions.

5. *Project Design to Benefit the Poor*

While agribusiness and rural enterprise projects have very attractive potential for generating growth with equity, this result is not automatic; considerable care in design and implementation are required to achieve useful results and project failures are not rare events. Three principal recommendations are made to increase the probability that positive employment and income impacts will result for the A.I.D. target group, the poor majority.

The basic recommendations apply to all types of interventions and constitute an analytical checklist against which to test each intervention and its components. The three recommendations all have a common focus of building on existing enterprise structures and of maximizing the involvement of the poor through the utilization of their skills, resources, and products.

1. All interventions should be so designed as to focus first on the use of the most important single resource owned by the rural farm and nonfarm poor, their **labor.**
2. All interventions should be so designed as to focus on the second most important resource of the nonfarm rural poor, their **small scale enterprises and the entrepreneurial skills they have developed** to operate them.
3. All agroindustrial interventions (those using farm products as their inputs) should be so designed as to draw their raw material from the second most important resource of the rural farm poor, their **small farms and the entrepreneurial skills they have developed to operate them.**

The nonpoor are comparatively agile in most rural and urban situations It is they, the nonpoor, who can usually take advantage of new resources, new government programs and incentives, new market opportunities, etc. The nonpoor are the ones who by and large have the skills and mobility to shift, to adjust, and to capture the benefit of most realignments in the rural economy. Perhaps the best way to at least reduce the natural advantage of the nonpoor is to **directly** utilize the poor and their resources in the intervention itself.

a. Focusing Interventions on Employment Creation

There are two basic ways to insure that agribusiness and rural enterprise project interventions maximize their impact on employment creation. First, focus the intervention on products with a high labor intensity; that is, those which require large proportional quantities of labor relative to capital and land. Second, to utilize technologies and techniques in project interventions which are the most efficient using "shadow prices" for labor. In simpler terms, the first is to favor the production of goods which use large proportions of labor, and the second is to use techniques for the production of all goods which utilize higher proportions of labor. For example, labor represents a higher proportion of total costs in the processing of fruits and vegetables at almost all levels of technology than in wheat milling. Fruit and vegetable products may be thought of as "labor intensive" products compared to "wheat flour." These labor intensive products should be favored in interventions. It is possible to process either fruits and vegetables or flour with different techniques, each having a different labor intensity. Regardless of the product involved, interventions should favor those techniques or technologies which are more labor using or labor intensive. These two project choices, choice of product and choice of technique, should both be used to focus on maximizing employment creation.

Project design may favor labor intensive technology by choosing to intervene and support smaller scale enterprises. Though the precise structure needs to be analyzed for each country, most agribusiness and rural enterprise subsectors reveal an increasing labor intensity (for the same product type) as scale decreases. An important issue often raised when labor intensive technology is addressed deals with the efficiency of using labor intensive technologies. The concern is often that in the enthusiasm for generating employment, efficiency and profitability not be forgotten. It has been argued that in labor surplus economies even some technologies which do not have high private profitability should be supported because they have justifiably high "social profitability." Social profitability adjusts wage rates to reflect the presence of underemployment of unskilled labor. While this argument may be important, it is probably true in many, if not most, actual agribusiness and rural enterprise projects that such an argument is not even necessary to support the viability of labor intensive technologies simply because the private profitability of the more labor intensive technologies is acceptably high.

A second method for favoring labor intensive technology is to identify viable labor intensive technologies and support them directly. This alternative could be accomplished in a number of different ways. A project could take existing labor intensive technologies and, using industrial extension, methods encourage and train enterprises to adopt them. Where acceptably efficient labor intensive "packages" do not already exist, research activities could be undertaken to identify and test viable alternatives. In combination with technical assistance, or without it, projects could provide financial support for the installation and/or operation of labor intensive technologies. The support could be either in money or in kind in the form of actual machinery or labor intensive input packages.

b. Focusing Project Interventions on the Enterprises Owned and Operated by the Rural Poor

The objective of focusing on enterprises owned and operated by the rural poor is to harness the entrepreneurial capabilities of the poor in the solution of their own problems, and secondly to reduce the proportion of project benefits which is captured by the nonpoor. Since the rural poor generally own and/or operate small scale enterprises, this focus also tends to concentrate project intervention on small scale and rurally located enterprises. A second reason for emphasizing those enterprises owned and operated by the rural poor is that entrepreneurial returns and profits from these enterprises are captured by the poor in addition to labor incomes. To the extent that larger scale enterprises, not owned by the poor, are the focus of project interventions, the poor will benefit only in labor incomes and not in entrepreneurial returns or profits.

The major benefit of focusing on small scale enterprises is that the poor capture both the labor and profit incomes. If larger scale enterprises are the focus, the poor obtain only labor income and backward linkage incomes from increased demand for small farm production. The project choice should therefore depend on the relative size and probability of these two potential income streams. If more total income can come to the poor from added employment in larger scale firms and from the increased demand which is generated for small farm output than can be obtained in the form of labor and profits in small scale enterprises, then the choice should be in favor of the larger scale intervention. If on the other hand, the labor income, profits, and backward links generated by small scale businesses are greater, the choice should be in favor of the smaller scale enterprises. The finding that net income per month worked, profit margins, and capital output indicators are very satisfactory for very small scale enterprises indicates that there is a vast potential for income and employment generation resting inside the enterprises owned and operated by the poor themselves.

c. Focusing Interventions on Maximizing the Backward Link Benefits to Small Farms

The first factor which determines whether an agribusiness intervention will pass on large benefits to small farms relates to the nature of the intervention itself. If the intervention is directed at expanding agribusiness output, the logical result will be to require more raw material input. If the intervention is to change the technology of enterprises, to increase its profit margin, to improve its management, or any other change which improves the business without expanding it, it is not likely that additional raw material will be required and hence little benefit will be passed back to suppliers. It should be noted that there are intervention types which may actually result in a decreased requirement for raw material. One way to increase the efficiency and profit margin of an agribusiness firm is to increase the conversion rate of raw material into the final product. A feasible agribusiness intervention might be

to reduce raw material waste in the agribusiness firm, and this may reduce the raw material demand and actually injure the incomes of raw material suppliers. Thus the nature of the intervention type chosen (improvement vs. expansion) will have an important impact on the proportion of the benefit which is passed backward to suppliers, a part of whom may be small farmers and part of the target group. Enterprises with different product types spend varying proportions of their total expenses on raw material. This proportion is here referred to as the raw material intensity of production. A project intervention will pass a larger part of its total benefit backward to suppliers if it is made in agribusinesses that have a higher raw material intensity.

The raw material supplied to agribusinesses does not all come from small farms whose families are members of the target group poor. Large farms may supply a very large proportion for certain products. In the event that the raw material is supplied by large farms, expanding the demand for raw material will benefit the poor only as they are workers on the larger farms, which is an employment benefit, but not a benefit to small farms. Large farmers are more institutionally agile, and viewed by processors as more stable and higher quality suppliers. It is therefore likely that when given a choice, most agribusinesses would probably choose the large farm suppliers. There are two project intervention alternatives which will increase the impact of projects on the welfare of small farmer families:

- Select agribusinesses for project interventions which process those products for which small farms predominate in primary production.
- Arrange the project so that part of the intervention itself structures the supply of raw material so as to require or at least raise the probability that small farms are the input suppliers.

d. Specific Types of Interventions

The discussion so far in this section has dealt with a framework for choosing interventions which will maximize the benefits of agribusiness and rural enterprise projects for the rural poor. The discussion in the present subsection deals with the intervention types themselves and provides a short description of each.

Training: Short-term courses, on-the-job guidance, self-education aids, and preparatory training are some of the more common means used to transfer relevant technical or managerial information. Instruction in basic accounting, marketing (e.g., demand analysis, promotion, distribution), production (e.g., planning, quality control), finance, and organization (e.g., personnel, organizational structure) can enable the manager to improve his/her operations.

Research Services: Techno-economic services, which are often included within one or more existing government or private institutions, often include economic research such as general statistics by industry, market surveys, and industry feasibility studies, and technical research on production processes and appropriate/modern technology. As the objective of such services is to provide the necessary knowledge for the entrepreneur to make well-informed business decisions and the government to improve policy affecting that entrepreneur, the research services must be closely attuned to the needs of the country's SMREs. It is therefore important to establish effective communication between organizations such as extension services which are familiar with the specific needs of target industries and which can assist in disseminating relevant information. Some research services which have been included within organizations with wider responsibilities have suffered due to low priority relative to other tasks.

Advisory Services: Managerial and technical advice in all critical areas, i.e., marketing, production, accounting, management, and finance, is usually offered through a variety of mechanisms. In some programs, the government develops and supports an extension service within an existing body such as the Department of Industry. Un-

fortunately, government bodies have frequently been unable to recruit and retain highly qualified agents; civil service regulations limit the salaries and promotional opportunities, and those with real business acumen usually go into business themselves. In addition, many governments have been slow in committing adequate resources to technical assistance agencies, thereby seriously handicapping their ability to service SMRE entrepreneurs.

Credit Programs: Rural entrepreneurs frequently identify credit as their primary problem. Although in many cases credit is a major constraint, there are often other problems. Hence, though credit needs clearly need to be addressed, other factors should also be reviewed and perhaps included as project components.

Facilitating Procurement of Raw Materials/Equipment: Facilitating procurement of raw materials/equipment can involve several approaches. First, basic policies affecting the scarcity of goods, e.g., those related to inflation, foreign exchange, or capital formation, should be reviewed to avoid any unnecessary shortages. Second, concerted efforts to improve the efficiency and effectiveness of the purchasing and distribution system must be made. Increased availability of information on supply and demand conditions can minimize the vulnerability of smaller rural entrepreneurs.

Marketing Aids: Aside from training and advisory services directed toward improved marketing, other approaches include improving the flow of market information, strengthening associations, and/or providing government or cooperative outlets for goods, and improvement of marketing infrastructure.

6. *Appropriate Technology and Local Participation*

A theme which has received increasing attention has been the need for more appropriate technologies and local participation in the development process of less developed countries. The concept of "appropriate technology" (AT) has received an enormous amount of attention since the early seventies, yet it remains a controversial subject and its proponents share a broad spectrum of philosophies regarding both its basic rationale and its practical application.

The concept of AT was in part one of the outgrowths of the criticism which gradually emerged as large-scale industrialization and modernization strategies for developing countries seemed to provide few positive results. Development efforts neither improved the severe employment situation in the LDCs nor distributed the benefits of growth in an equitable manner. In reality, the industrialization strategy encouraged migration from the countryside to the cities where there were few opportunities and urban problems were severely exacerbated.

This criticism led to a number of explanations of the causes of the modest achievements of twenty-five years of development efforts. From this emerged the general recognition that the past strategy had focused too much upon the LDCs duplicating the capital-intensive industrial structure of the developed countries through the direct transfer of "Western technology," when their own factor endowments favored labor-intensive and local natural resource intensive production.

It became recognized that technological alternatives had to be examined and chosen with greater care to ensure that those most appropriate to the factor endowments of the locality of an activity were selected. In terms of LDCs, of course, this generally means technologies should be employed which are intensive in the use of abundant factors (labor and natural resources) and light in the use of scarce resources, capital and highly trained personnel. For this reason it is often referred to as "capital light" or "low cost" technology. Appropriate technology, however, has come to mean many things to many people, and there are many issues unresolved with regard to its practical application.

Appropriate technology offered a way of impacting employment, income distribution, and migration problems by focusing production processes on labor-intensive technology. It allowed a focus on the rural, traditional sector with links to agriculture in addition to offering small scale production which would not require concentration of economic activities in the cities, but allow their dispersion throughout geographical regions. And most importantly, it would maximize employment and income distribution goals through the more judicious use of scarce capital by employing more of the poor per unit of capital, especially those who had traditionally had no access to it.

Appropriate technology has been attractive for not only its economic implications, but also for its applicability to other socioeconomic problems proponents have identified as arising from the industrialization strategy. Commonly, AT literature treating the modern sector in which many larger agribusinesses fit tends to focus on the need to either adapt and modify existing techniques or rediscover techniques which used to be employed in the developed countries when the relative labor/capital costs were more similar to those of the LDCs today. This approach has led a number of AT organizations to search for older technologies among small shops in relatively backwards regions of developed countries, believing that this will broaden the technological shelf of information from which the LDCs can draw.

While this approach can undoubtedly be fruitful and has proven to be so in a number of cases, the survey methods outlined in this manual also offer an important approach for identifying firms already applying appropriate technologies. There are many cases where agribusiness firms have little access to capital subsidies and few ties with institutions and companies which promote "modern" technologies, so they of necessity develop more labor-intensive and capital light technologies. The survey will allow an identification of such firms in the same way as for small scale enterprises, allowing for a dissemination of their technologies to other firms.

C. Part II: Project Analysis Techniques

1. Profile or Assessment of the Agribusiness and Rural Enterprise System

The objective of an agribusiness-rural enterprise profile is to provide an overview of the sector, its structure, general technology level, and to provide a backdrop for rational identification of project opportunities. The Country Development Strategy Statement (CDSS) is the appropriate document for the general conclusions of the profile. Project identification can be commenced in a well done profile, which can also be the basis for determining what additional data would be required for further project development. In content, the profile is similar to what A.I.D. has called Sector Assessment and its intent is essentially the same, to provide a broad view of the sector and its problems.

A profile should contain a general quantitative description of the relative size of the various subsectors defined by product type, by region, by scale, etc. It is important for the project planners to start from a base line of relative size information. The profile should contain a description of the major institutions which provide services to agribusinesses and small and medium scale rural enterprises. The institutional profile should deal with such issues as the volumes of credit for each of the subsectors (product type, scale and regions) by institutional source. Technical assistance provisions should be outlined. The role of industrial associations, cooperatives, craft and trade organizations, etc., should be discussed and their relative contributions to various financial and technical services estimated. The institutional profile will often be the least quantified yet among the most important sections of a profile,

for it is at this point that limits on the ability of A.I.D. to intervene will begin to surface and areas of need will begin to take shape.

The profile should contain an assessment of employment potential of the sector and its subcomponents. The cost of generating additional employment is a vital issue to which a profile can direct its attention by presenting an outline of the labor intensity of each subgrouping. With this information, project planners can assess the relative potential of different product types, scales, and regions.

Profitability is an important concept for the profile because it relates to the financial feasibility of expansion or indeed starting up an enterprise. It contains information on the efficiency of technological and managerial processes, the market demand for products, and the necessity for technical and managerial assistance. A profile of profitability provides the project planner with a rather broad understanding of many factors at once. It is particularly important to utilize all of the groupings mentioned in the "definitions" discussion Product type, scale and regional distinctions in profitability profiles will illuminate important project design issues.

Since increasing incomes of poor households is the principal aim of most rural enterprise interventions, the profile of income generation is perhaps the most important. The income profile also assists to lay the basis for the selection of a project target group by indicating the types of enterprise households that fit A.I.D.'s rural poor definitions.

Where statistics permit, an over-time trend should be profiled in the growth patterns of output by sector. In most developing countries, rural enterprises employ large numbers of women in worker and manager roles. Rural enterprises have the potential of being the most important avenue for improving the status and welfare of rural women, and it is important therefore that the profile include information on the nature and magnitudes of their role.

Analytical methods for a profile should be limited to simple statistical comparisons and accounting methods. Profitability and productivity ratios represent the most difficult methods feasible given the time and resource limitations of most profile efforts.

2. *Project and Target Group Identification*

A.I.D. has outlined an orderly process of project identification which begins with the CDSS document. This process leads in a relatively systematic fashion from general five year A.I.D. strategy to the identification of particular projects The development of the CDSS and supporting sector assessments and profiles is an important part of identifying projects which will address the overall needs of the poor. Moving from an overall A.I.D. country strategy (CDSS) to analyses of particular sectors (Agribusiness and Rural Enterprise Sector Assessment or Profile) and then to individual project identification (PID) allows for an orderly review of information at increasing levels of specificity and reduces the probability that projects are identified simply because some A.I.D. or Host Country official has a particular project in mind.

Project identification and development is divided into stages by the A.I.D. programming cycle. This project analysis manual is designed to fit into and to complement that cycle. The cycle implies increasing certainty and level of detail at two principal levels, first at the project identification level (PID) and secondly at the project paper level (PP of CAP). Analysis appropriate for the first (PID) stage is outlined in this section, while the more detailed and elaborate analysis appropriate for the preparation of the project paper is treated in Chapters 8-11. All of the constraints analyzed in this section on a preliminary and superficial fashion based on the sector profile would be re-

examined based on enterprise data drawn from actual target group enterprises. It is important that this preliminary analysis be very simple and require at most a few weeks if it is to fit in appropriately to the project identification stage of A.I.D.'s programming cycle.

One of the major purposes of the sector profile and the preliminary constraints analysis is to facilitate the selection of a target group for a particular project or for an integrated set of projects. Two separate steps in selecting a target group are facilitated by the two separate mechanisms:

a. The sector profile facilitates the process of determining what subpopulations or subgroups of enterprise households qualify as poor by A I.D.'s definition.

b. The preliminary constraints analysis should suggest which subgroups have a high potential for improvement with interventions of the type A.I.D. can provide.

These two steps, first determining qualifying subgroups, and secondly identifying subgroups with potential for improvement with A.I.D. interventions, set the stage for the identification of a project implementable target group. In many cases the groups qualifying for assistance and amenable to improvement may be so diverse (both geographically and conceptually) that it is not practical to implement a project to access them. The last stage in target group selection is therefore to search for practical groupings around which a single project mechanism or institution could reasonably implement an intervention.

There is an obvious interaction between determining which groups can be positively affected by an A.I.D. intervention and identifying project. The most important element which must be added which target group identification lacks is the addition of an institutional mechanism. Project planners must conceive of an existing or feasibly creatable institutional structure to make the needed intervention. It should be remembered that most often project planners begin with an institution and a more or less completely h ched project idea before any target group identification or sector profile work is undertaken. In this more common case the information surfaced should not be used to justify that conception, but rather to refine it within the boundaries imposed by the institution selected. The more advisable course is to begin with an overview of the sector in the form of a profile, add to that an examination of the constraints which limit improvement for different groups in the sector, define a target group based on their level of poverty and potential for improvement, and last of all select mechanisms to attack some critical set of constraints.

3. Target Group and Enterprise Analysis

The purpose of the target group family analysis is to provide project planners with a comprehensive view of the families to be benefited by project interventions. Three major dimensions of family welfare are important in the profile:

—a profile of family income and economic activity

—a profile of family employment patterns

—a profile of other dimensions of family welfare such as housing, health, nutrition, and education.

This analysis would also cover the economic and technical characteristics of the enterprise itself. The enterprise is the vehicle for increasing welfare and it is important to examine its principal characteristics in an adequately structured profile. A topic for the enterprise profile is the concept of efficiency. Efficiency should be broken into financial efficiency or profitability, economic efficiency with capital productivity as its primary indicator and labor

efficiency using labor productivity as the indicator. The second general area for a profile is the structure of the enterprise, its output patterns, resource endowments, etc.

4. Estimating Project Potential

In the A.I.D. context agribusiness and rural enterprise projects are undertaken to improve the welfare of the poor majority. Chapters 9, 10 and 11 deal with three basic project issues:

–What will the project benefits be? (What is the magnitude and probability of improvement in target group welfare if the project is implemented as designed?)

–Can the project be implemented as designed? (What is the probability that the project is feasible?)

–Do probable project benefits justify project costs?

Project analysts familiar with A.I.D. and other international donor procedures will recognize the last two issues as the traditional project analysis topics of "feasibility and cost benefit analysis." One of the major intents of this manual is to emphasize the importance and common neglect of adequate analysis of the first issue, which relates to estimating the potential of the project to create improvements in target group welfare. The most common inadequacy in current A.I.D. project analysis is the weak basis for estimating target group benefits which would be caused by the project intervention. Very often projects contain adequate exploration of project feasibility (institutional and enterprise level capacities) and relatively extensive benefit/cost analysis, but lack any systematic evidence that the assumed benefits will actually happen. The potential of a project for welfare improvement depends directly on whether the project intervention addresses an important and correctable need in the targeted enterprises. Identification of critical constraints at the firm level must be an integral part of project design and estimation of project potential.

A second way to explore the relative importance of alternative firm level constraints and potential project interventions is to ask the entrepreneurs themselves in large enough numbers that the results could be expected to be representative. Given the subjective nature of questions about constraints, the method for interviewing is fraught with possibilities of misunderstanding and inaccurate reporting. It is, however, useful to do so since it gives the project designer a reasonably representative view of at least how entrepreneurs respond to questions about their businesses and what factors are holding them back. How the entrepreneur perceives his problem is important project information even if it is decided from more objective data that his perception is incorrect. In the last decade there has been a general and growing consensus that small farmers are rational economic men and very often have correct perceptions about how to manage and improve their businesses. While there is less concrete evidence available on small scale enterprises, the evidence extant would support the idea that the small scale entrepreneur is reasonably rational; his opinions about constraints should be seriously considered.

Estimating the potential of the project to increase income, employment or some other welfare impact will require a different technique for each type of intervention. There are, however, some general principles which may apply to most of the common project types. Most projects propose to provide some added service, input or infrastructure to the enterprise. Each project operates on a hypothesis about change, that the chosen intervention will cause additional welfare. At this stage we are not asking project feasibility questions, we assume that the project intervention is feasible. The issue addressed in this analysis is the magnitude and probability of income or employment impact if the project is carried out as planned.

5. *Project Feasibility*

A project may have excellent potential for improving the welfare of the target group and yet not be implementable due to any of the following infeasibilities:

–The institutional structure is incapable of providing the service, input, or infrastructure intended

–The enterprises targeted are not willing and interested in the services or inputs of the project; there is no demand for the project intervention in the way it is offered

–The project intends to expand output and there is insufficient demand for the product or project enterprises cannot price compete with alternative producers.

Each of these situations raises a feasibility issue questioning whether the project can be implemented as designed, can the institution do it, will enterprises be interested, is there a market for the product?

A wide variety of institutional capacities ought to be the subject of feasibility analysis. In many cases, this analysis is complicated by the fact that one of the common project objectives is to strengthen particularly weak aspects of the institutional structure. Where institution building is one of the central objectives of the project, the analyst must first estimate the feasibility of the institution building component (i.e., is the institution capable of absorbing and internalizing the proposed improvement?) and then proceed to analyze whether the institution as improved will be capable of realizing the other project responsibilities. The methods for examining institutional capacity are not standard or systematic enough to be the subject of extensive exposition. Some factors can of course be quantified, yet in the main the subject is more one of judgment than of statistics.

While firm level profitability implied by any intervention is a useful element in many aspects of project analysis, it is never more important than in the feasibility section. If an intervention does not have a very high probability of increasing profits to the entrepreneur, it should not pass the financial feasibility test. This seems so obvious as to not need restatement, yet very few project analyses provide satisfactory evidence of this potential beyond the assertion that the intervention will be profitable. Firm level data based on enterprises in the target area, or at least in similar areas, indicating profitability measures where the proposed intervention has already existed should be presented to support the assertion that the intervention is financially feasible. In addition to concerns about firm level profitability, there is the concern that the particular project proposed will not return sufficient funds to allow the institution to retain its financial viability. This is particularly true of credit operations, but may extend to technical assistance and research programs in that project activities may drain institutional resources without proper allowance for their replacement. Interest rate policies, public commitments to institutional budget allocations are all topics of analytical concern when examining the question of institutional financial feasibility.

Credit interventions depend centrally on the interest of entrepreneurs to undertake additional liability, and there is considerable concern indicated in the literature that small scale rural entrepreneurs may be overly cautious in avoiding risk which may impel them to avoid even wise borrowing. An important project feasibility issue for credit projects or credit components of broader projects is whether there is sufficient interest and willingness to borrow among target group enterprises. The process of estimating demand for a service such as technical assistance or advisory services is more difficult than is the case with credit. The first part of the problem is that it is much more difficult for the entrepreneur to sense the direct need and benefit which may come from technical advice. It is therefore possible that negative responses from entrepreneurs if asked about their interest in receiving technical assistance may not be conclusive evidence that they do not need or would not benefit from such advice.

Even if there is interest in and demand for project inputs, and there appears to be demand for project outputs, there remains the important issue of competitive production from other sources which may invade that demand and prevent project participants from even implementing the interventions contemplated by the project. In order to examine this possibility, some comparative cost analysis needs to be undertaken to establish the feasibility of project productive activities competing with possible other sources of production.

6. *Cost Benefit Analysis*

Chapter Eleven deals with the process of comparing the benefit potentials (discussed in Chapter Nine) with the costs of undertaking an agribusiness or rural enterprise project.

a. *Estimating Benefits: The Core of Adequate Cost Benefit Analysis*

The most important failing of most cost benefit analyses conducted by or for A.I.D. lies in the inadequate data and method used to estimate the size and probability of expected benefits. It should be remembered that the methodology of cost benefit analysis does not assist in estimating the probable benefit, but only provides a way of comparing that benefit, once known or estimated by other means, with project costs. Little added work is necessary to transform a well developed estimate of project potential benefit into a cost benefit ratio; almost all of the work, effort, time and intellectual energy is consumed in making the original estimate of expected benefit. It is unfortunately true that in most A.I.D. cost benefit analyses, little data and effort have in practice been expended on measurement of the benefit; the time and work have been focused on the arithmetic of cost benefit methodology. In a general sense there are two overall avenues of approach to estimating the probable benefits which would flow from an agribusiness or rural enterprise intervention. The first would be to compare actual with and without situations and measure the final difference in result or benefit to family incomes, health/nutrition and other welfare. The second is to describe the assumed causal mechanism by which final impacts are to be reached and using data (which could range from very reliable and systematically gathered to simple guesses) attempt to estimate the magnitudes of each of these probable causes to the final result.

We cannot normally control adequately all of the factors which could cause welfare in a **with and without** comparison, nor is it likely that we understand how enterprises and households operate in diverse cultural and economic situations and how each possible cause will finally affect the complex enterprise and household systems. The A.I.D. manager is left with a choice between approaches which are both questionable. It is difficult for the project planner to make judgements about the relative inaccuracy of method and the tendency is therefore to simply reject all methods which require substantial time. The approach most often taken is to simply sum the best official guesses as to expected benefits and spend what little time and money are available on manipulating these **best guesses** inside the internally consistent and easily controllable arithmetic of cost benefit computations.

A better alternative would be to carefully review the relative confidence which A.I.D. and outside analysts have in the factors which determine the accuracy of the two alternative techniques and choose one of these approaches for estimating potential benefits. Definitions are given as follows:

Comparisons: With and without intervention comparisons of existing enterprises and households. The things compared are final welfare indicators such as income, employment, health and nutrition, housing, sanitation and education.

Projections: With and without intervention accounting projections of what is expected to happen to each different probable cause resulting from the intervention. The attempt is to show the expected magnitudes and connection with the project intervention of welfare impacts. Each important probable effect must be estimated.

The **comparisons** method requires field enterprise and household data from the target group; there is little possibility of conducting this type of analysis based on expert opinions or judgement. The **projections** method is much more flexible; it can be conducted at almost any point along the continuum from extensive field data to office best guesses, and while the results may vary tremendously in quality depending on the reliability of the data source, the results do not vary in form. By looking at the final analytical result one cannot tell in the **projections** method a careful and reliable estimate and a "seat of the pants" guess. It is probably the result of this flexibility and not of a systematic review of the alternative which has led almost all A.I.D. project analysts to choose **projections** as the method for estimating benefits.

Review of Methods for Estimating Benefits of Agribusiness and Rural Enterprise Project Interventions

The Basic Question is Which Can We Do Better?	Better Method to Choose
1. Identify the ways this set of project interventions will change enterprises and households, how they will react to these changes and how they will in sum affect household income, employment, health, nutrition, housing and sanitation	Projections
2. Identify households and enterprises with and without the kind of interventions proposed but from similar cultural and economic situations	Comparisons

b. Benefits, For Whom?

Traditional cost benefit analysis was concerned with total benefits without focus on any special group in the economy. The Congressional Mandate has made it clear that A.I.D. projects must focus on benefits accruing to the "poor majority." Cost benefit analysis conducted for the purpose of enlightening project choice of A.I.D. investment should explicitly focus on the poor who benefit. Integrating considerations of poor beneficiaries into cost benefit analysis is not easy because it departs immediately from one of the attractive properties of the benefit/cost ratio; i.e., that if properly calculated, projects with ratios more than 1 are acceptable investments and those with ratios less than 1 do not have benefits to justify their costs. If only a part of the benefits are included in the numerator of the ratio there is no reason to think that ratios above and below unity (1) have the same significance. As comparative tools the ratios would retain their utility if adjusted to account only for income benefits to the poor, but the significance of the absolute ratio and its position above or below 1 would disappear.

For direct benefits and reasonably immediate indirect benefits it may be possible to keep accounting track of the income level of the beneficiaries so that they can be classified as poor or nonpoor. For truly indirect benefits it is virtually impossible without extensive "input-out" models to make such a distinction. The poor who benefit from agribusiness and rural enterprise projects in a reasonably direct fashion fall into the following groups:

–Poor entrepreneurs or owners of enterprises (benefits come in the form of increased profits, returns to invested capital, or returns to management and labor.

–Poor wage or salary earning laborers who work in affected enterprises (benefits come from increased employment or increased wage rates).

–Poor farm families who own and operate farms supplying raw material to the affected enterprises (benefits come as increased farm profits, return to invested capital or returns to management and labor.

–Poor farm laborers who work for wages on farms (poor or nonpoor) supplying raw material to the affected enterprises (benefits come in increased employment or wage rates).

If it is possible to measure the proportion of each affected group which lies below the poverty line, it will be possible to use one of the methods described in Chapter Eleven to make the cost benefit ratios reflect a direct concern for income to the poor majority.

c. *Costs in Cost/Benefit Analysis*

The denominator in benefit cost ratios is considerably less troublesome than the numerator; except for a few adjustments the cost side of the ledger can be generated from existing data.

Chapter Eleven examines techniques for selecting discount rates, shadow pricing labor and imported inputs, and the arithmetic of basic cost benefit computations

D. *Part III: Data Gathering for Project Analysis*

1. *Data Gathering Alternatives*

Chapter Twelve elaborates a typology of data utilized in the various stages of agribusiness and rural enterprise project analysis and an inventory of the alternative data sources which can provide the necessary data. A considerable description of data and data gathering methods is dispersed throughout the other chapters; the role of Chapter Twelve is to gather these disperse data uses into a limited number of general types and indicate alternative sources. It is unfortunately true that most of the sources which may be relied upon for existing data for enterprise analysis fail to provide the necessary household information for A.I.D. project analysis. The focus of the Congressional Mandate for A.I.D. is on the household, its income, employment and other welfare dimensions Agribusiness and rural enterprise projects may be important contributors to household welfare, but they are only a part of the system which impacts on households. Household members usually work in more than one employment type; farm employment and enterprise employment are important complements. To analyze enterprise employment in he absence of other household employment activities would be too partial for adequate project analysis.

Only two data gathering alternatives hold significant hope of providing the necessary household data for project analysis. These two are an A.I.D. initiated sample survey or a case study effort. Existing census, survey, institutional and secondary data sources are unlikely to contain the household welfare information which is required to link agribusiness and rural enterprise analysis with household benefit, and household resource allocation issues vital to A.I.D. project analysis.

2. *Case Study and Informal Data Methods*

a. *Case Study Methods*

Two major compromises are involved in selecting the case study approach to generating enterprise and/or household data. The first is that the statistical reliability of the data is uncertain; the second is that with a limited number of cases, the richness of comparisons is very thin. Both of the weaknesses focus attention on the method by which cases are selected for inclusion in the study. Utilizing a census or survey to classify (or stratify) the enterprises into classes, the case study can draw one firm from each general type with some confidence that the resulting cases have some desired level of coverage of the sector or target group as a whole. With some overall data to use as a weighting scheme, the relative importance of the findings of different enterprise case studies can be roughly estimated. For example, if small baking enterprises represent only 4% of the target group, the case study on baking will be placed in its proper perspective. If the 4% position of baking is not known, the relative importance and weight which ought to be given to its case study will likewise not be known.

Selection of cases for maximum representation is therefore accomplished by stratifying the population into its major components based on the best global data available. If the cases must be drawn in a truly haphazard fashion, there is no way to know how to interpret the results. In saying that careful stratification will increase the representative nature of a series of case studies, it should be remembered that there is little basis for choosing the enterprise or household to be studied inside the stratum, and it is not likely that one single case could possibly be statistically representative of the group as a whole. To achieve any stable kind of statistical reliability from case studies there would have to be at least 30 cases from each stratum, and by the definitions used in this manual the study would then be a "sample survey" and not a case study. A continuing emphasis in the data requirements of project analysis has been the need for "comparison" data of many types Data with and without project interventions, data to compare before and after project interventions, and data to compare and look for differences which may give rise to possible project interventions with significant potential. The selection of cases will have a direct impact on the ability of the analyst to make these comparisons and should be kept in mind during the case identification process.

If the case study method is adopted, for example, in an evaluation context to provide data for estimating project impacts, then cases would need to be selected which matched participant cases with nonparticipants, or which treated "before" cases and "after" cases on the same enterprises or households. If the case study method is adopted to estimate project potential, selected cases would need to include enterprises with and without the proposed interventions. The comparison use of case studies can contribute added detail for analysts and should be seriously considered whenever micro analysis is chosen.

b. *Informal Data Methods*

The central burden of A.I.D. project data gathering has always been, and continues to be borne by field trips and interviews with host country officials. While these methods are generally inadequate because of their inability to provide even token reliability and are subject to personal bias, there are situations in which they are the only acceptable mode of data gathering. The gradual focus of A.I.D.'s interest in household level impacts and in

enterprise level interventions in which the poor participate in their own development has increased the difficulty of working with field trip and informal discussion as the basic vehicle of data and information gathering.

Where the data to be gathered are about the commitment of an institution to a proposed project intervention, the best way to gather that information is by direct discussions with the institution concerned. There may be objective indications in the form of documentary commitments of funds or other indicators, yet direct discussion is probably the best method for ascertaining intent. Institutional capability may be assessed most adequately in these informal ways with experts whose long experience in similar situations qualifies them to draw capacity conclusions from the face-to-face interchanges. Outreach capacity is an exception to this general rule; statistical evidence of the historical outreach accomplished is superior to discussion as a source of data. Informal methods have the advantage that they can fit almost any project development time frame, work with almost any problem, in any season, and require only limited administrative support. Their flexibility is at once their principal advantage and disadvantage.

There is an old axiom which is held in many different forms in different A.I.D. missions, but means the same thing: You can almost always predict the result of a consulting visit if you know the consultant well, know his field and his interests and opinions. This is an important disadvantage of the less structured methods of data gathering and project analysis; and field trips and host country discussions are the least structured of all. In these methods the biases of the analyst may surface virtually untrammeled by actual data. To be sure, if the analyst is a particularly unbiased person this may not be damaging, yet even professional training gives economists, engineers, extension specialists, agronomists and all other competent professionals a particular outlook or focus or approach to problems. It is not difficult to understand why the sociologist fails to identify the engineering obstacles as the central issues, or why the engineer does not usually identify the religious attitudes as binding.

While informal methods may seem inexpensive because the total cost is a completely manageable figure, if the amount of data gathered per dollar is calculated the method turns out to be one of the most expensive ways to obtain information. To most practitioners the field trip would not be justified as a "data gathering" exercise; most field familiar professionals who think that field trips are very beneficial (the author included) would argue for them based on the "field sense" that is obtained by simply spending time probing haphazardly around. While it may be easy to argue for this, it is difficult to justify field trips as a cost effective method for obtaining project analysis data.

3. Sample Survey Methods

The most comprehensive method for obtaining project analysis data which are representative of the target group population as a whole, and of its principal components, is a sample survey. By a sample survey we mean a carefully selected subgroup of enterprises and/or households whose resemblance to the total population can be predicted with standard and well practiced statistical techniques. Information from the sample will represent at some measurable reliability the characteristics of the enterprises not surveyed.

There are many decisions to be made regarding a sample survey. Chapter Fourteen is decision-oriented—its objective is to provide the A.I.D. project team with the necessary level of understanding that they could write a scope of work for a survey, and then monitor the process. It is not possible to condense into a treatment of that size all of the necessary information to allow managers to become survey research statisticians, but it is possible to raise the level of awareness such that the A.I.D. manager can interact with survey experts to make certain that he gets what he wants.

At each decision point in a survey project there are options; this chapter attempts to outline those options and without detailed description suggest the pros and cons of the major alternatives. There are six principal areas of choice in a survey. They are:

1. A method for selecting the sample must be chosen.
2. The number of visits at each observation must be chosen (one visit, return each week, etc.).
3. If a control group is needed, how will it be selected?
4. The instrument must be chosen (Recall Questionnaire, Record Keeping, Direct Measurement).
5. The methods of selection, training and supervision of field workers must be chosen.
6. The approach to coding and data processing must be selected.

Each of these topics is discussed in a separate section of Chapter Fourteen.

E. Part IV: Implementation and Evaluation

1. Implementation

Implementation is here defined as the period of a project's life after design is completed when planned activities are carried out in the field. It is the direct action phase. While volumes have been written on methods for project design and evaluation, comparatively little has been written on the methods for improving implementation. Allison has referred to the analysis of implementation as the "Missing Chapter in Conventional Analysis" and though a careful recent review of the implementation literature by Ingle identified copious documentation on the subject, yet implementation remains the project stage which has been most ignored by analysts.

Chapter Fifteen distinguishes between two types of activities which take place during the implementation phase of a project. The first of these is termed "implementation," the second, "monitoring." Implementation is taken to be the project activity itself, undertaking project tasks; while monitoring is defined to be the information gathering and reporting which provide project monitors and managers with the necessary knowledge of project progress to make improved implementation decisions.

a. Project Implementation Problems: Prevention vs. Cure

If the analysis process outlined in Chapter Ten (Examining Project Feasibility) is followed before projects are approved, many of the problems which later surface during implementation will be prevented. Institutional feasibility analysis conducted during the project design phase should suggest areas where implementation bottlenecks are likely to arise and where increased staff, staff training or added resources and assistance will be required to prevent implementation crises. There is great benefit in early identification of problems; in many cases the sheer momentum of a large project in motion prevents the solving of problems which were not identified early enough. Changes made in the project design phase are relatively painless, while modifications made later are costly, and in many cases impossible to make. One way to get a project design which is implementable is to include the people who will have to implement the project in the team elaborating the project design. Those who are faced with the responsibility of actually undertaking project activities are often more serious about making certain that the design is institutionally feasible.

b. *Experimental Approach to Implementation*

Three decades of development assistance projects without adequate evaluation have left a legacy of uncertainty about which technical assistance and direct investment approaches work. In this environment it is not easy to design projects around tested principles, yet the project review process demands a decisive and definite tone in project proposal documents. Project designers feel compelled to claim to know the right way even if they are uncertain. While there is in reality much that is experimental in almost all agribusiness and rural enterprise projects, project design teams rarely express the experimental nature of proposed activities, and more importantly, almost never design the implementation process as an experiment.

At a variety of decision points in the design process, analysts face two or three alternatives in the project design, none of which are clearly superior. Instead of establishing the project as a format for finding out which of the design alternatives work best, most design teams select one with very little reason. Implementation experiments need not be elaborate scientific structures; they can be as simple as trying one vehicle per rural loan officer in one area and three officers per vehicle in another to see if the added investment really results in sufficient added lending activity to justify it.

c. *Institutional Mechanisms*

Most of the work of implementation may be divided between "accessing" the enterprises and "intervening" in the enterprise. If the number of enterprises is small there will be relatively less implementation work in building and refining access channels. If the project involves large numbers of small scale rural enterprises, service and resource delivery systems will be a large concern of the implementation process. In most cases there are private and public alternative channels for the delivery of project services and resources. For example, in the case of enterprise credit there are public development banks, and in the private sector there are private banks, moneylenders, product purchasers, etc. Care should be taken to explore both of these alternatives. Where viable private channels are available, there are significant implementation advantages in utilizing and improving them. In many cases, however, public channels are the only viable alternatives.

Another implementation method is the linking of private U.S. intermediary mechanisms to LDC food and fiber delivery systems. Examples include both nonprofit and profit organizations, multinationals and medium size firms. In various ways these institutions link government, rural, and agricultural development goals with corporate profitability and operational abilities. In certain specific cases, Missions and host countries should examine the feasibility of utilizing these mechanisms to implement the project in regard to training, technology transfer, generate employment, increase agricultural production by small farmers, establish viable small business and satellite industries and promote cooperatives and associations.

A number of intermediate organizations have created some promising new initiatives to utilize the skills and resources of large corporations in food systems and rural development. In essence these organizations serve to link corporations to the local political and social environment and to the needs and aspirations of the host country in which they operate. The new processes they have developed use local labor, capital and natural resources, plus modest outside capital, to create viable enterprises which would not otherwise come about. Their projects all emphasize the transfer of technological and management skills to host country nationals. Most, though not all, manage to operate on relatively modest budgets.

Sources frequently overlooked in the implementation phase by field Missions, but ones that have been successfully adopted in some countries, are local institutions. On all projects, a determination should be made regarding local capacity to resolve most, if not all, of the barriers to rural development. This would include hiring or contracting under the project the service of local business schools, development and regular commercial banks, credit unions, marketing and production cooperatives, subsidiaries of multinational firms, indigenous private sector firms and universities. All these are possible sources of managerial and technical personnel and could be utilized in both the design and implementation phase.

d. Project Management

Implementation requires management skills and in this respect stands in sharp contrast to the other stages in a project's life which require analytical skills. Project management presents many challenges, some of which an international development agency like A.I.D. is not inherently equipped to confront. Management presents a problem due in part to the concern that for many projects, indigenous management is not sufficiently trained to handle the project implementation process.

A common thread running through much of the recent legislation and literature of development policy involves the topic of local "participation." As it relates to agribusiness and rural enterprise projects, "participation" means the participation of beneficiaries (entrepreneurs and benefited families) in both the benefits and the management process of the project. Project decisions should involve participating entrepreneurs and producing families to the extent possible. A number of both theoretical and field studies have indicated the importance of participation in insuring eventual project success. The most obvious gap in all implementation processes is the availability of capable and motivated people to manage. Even a poorly designed project in the hands of effectively trained and motivated managers has a very good chance of success. It is important that the dominating influence of individual managers not be overlooked.

While the capacity of local managers is an important constraint, it is also true that there are many capable people in most developing countries who may be drawn to project management tasks if there is sufficient incentive and initiative on the part of the project itself. While it is unlikely that there is any simple solution to this problem, an important contribution is a personnel management plan integrated into the project design. It is unfortunate that while almost all development analysts recognize the importance of personnel management, it is rare indeed that a project design devotes much time or energy to a personnel management and incentives plan. "Personnel" as a subject matter is dealt with as one of the four or five standard blocks of management knowledge taught at management schools, yet as a subject in project design it is almost always ignored. There is seldom any systematic plan for insuring that the best knowledge in the "personnel" field is employed to contribute to project success.

Where capability of management and implementation personnel, however selected, is weak, a training component will be a vital part of the project design. Funding and planning will be required to make the training component an efficient and effective tool for improving project implementation. Implementation is more likely to be affected by its success or failure in attracting competent management than any other single factor. Analysis of institutional competence will not substitute for personnel analysis. The competence of the handful of individuals who end up managing the project, and not the general competence of the organizations involved, will probably be the predominant factor influencing the success of project implementation.

e. Project Monitoring

An important element in most agribusiness and rural enterprise projects is an institution building focus which seeks to strengthen an existing institution, or in some cases to build a new one. Monitoring the progress of these institution building objectives differs so widely, depending on the particular institutional aspects to be assisted, that general guidelines on method would be virtually useless. Specific objectives and targets should be set and the performance on these targets should be tracked.

The project log-frame contains the basic logical structure for fleshing out a monitoring design. Most project log-frames provide the basis for a sufficiently complex monitoring system to adequately track the "intermediate" part of project objectives. Tracking the final impacts of projects during the implementation stage has a number of problems. First, it is probably true that the final impacts on households would not mature in the early stages of project implementation. Secondly, even after they do begin to mature, it is largely inappropriate to evaluate such impacts as a part of the monitoring system, since such a mid-course evaluation is probably already built into the project evaluation plan. The role of monitoring final impacts during project implementation may be seen, however, as providing a different perspective on final results than a mid-course project evaluation. It may, in fact, be very useful to begin gathering data on final impacts even before it is expected that there will be any resulting from project inputs. As the project progresses over time the monitoring results will blend into the evaluation design. Not only will final impact measurement enhance implementation by signaling changes in focus, but it should build a serious basis for evaluation.

2. Evaluation

The most immediate purpose of evaluation is to determine the effectiveness of a particular project. The evaluation should b planned around the Logical Framework which states project purpose and goal level indicators. These log-frame indicators should be used to evaluate project performance and to provide a structure for the evaluation effort since in a sense the log-frame may be viewed as a plan for evaluation at a general level. Evaluation efforts may be undertaken during the course of the project to provide project managers with mid-course information on project performance and may lead to changes in the ongoing project as mentioned in the monitoring discussion above. Beyond the obvious need to ongoing and final information on project performance and success, there are other potentials in the project evaluation process.

a. Project Design Guidance from Project Evaluation

Designing effective projects requires a wide variety of information about project potentials and implementation mechanisms which will work in practice. All international agencies have expended considerable effort to improve their project design work. Additional analysis is conducted before making project funding decisions to assure that the project has a good chance of making a cost effective contribution. There are, however, many strong factors which hinder pre-project analysis and have rendered it relatively impotent in practice. Chapter Sixteen argues that for both practical and conceptual reasons, adequate evaluation of prior projects of similar type usually benefits project design more than an analysis undertaken during the project design. In project design the analyst wishes to

determine what will work, to estimate the potential impacts of doing one project as opposed to another, or doing the project one way as opposed to another. In the design stage, project potential can be estimated either by the educated guesses of experts or by the analyzed experience of past interventions. Certainly time will not permit the project designer to analyze past interventions carefully if that work has not already been done; s/he must rely upon his/her own best guess, which can hardly be classified as design "analysis." If effective project evaluation information is not available, project design analysis must be shallow because there is no analytical setting for the design analyst to test his/her bald hypothesis. Effective evaluation would gradually build a reservoir of project impact and design information which would reduce the burden of pre-project analysis and would help alleviate the bureaucratic and practical problems which beset the A.I.D. programming cycle. Many A.I.D. officials have spoken about the need to develop an institutional memory which learns from its experience. Project evaluation analysis is the core of this vitally important activity.

b. Evaluation of Final Project Impacts on Target Group Households

For the purposes of evaluation, it is useful to outline a chain of events which causes a project intervention to have a favorable impact on target group households. While any causation chain involving human behavior is endlessly complex in reality, simplified versions which are admittedly lacking in accuracy may help to structure an analytical process. The general project chain for agribusiness and rural enterprise projects outlined below is divided into impacts or changes which occur at three different and sequential levels:

1. Institutional level—an institution lends credit or provides technical assistance.
2. Enterprise level—the enterprise increases its output with the increased credit, or its efficiency with the technical assistance.
3. Households level—the household members obtain more net income or live in a better home as a result of the increased efficiency or output.

This particular conception of the causation chain is most useful because it provides a structure for evaluation and fits neatly into the Logical Framework which is an already functioning part of the project programming cycle and documentation. Each of these levels should include an evaluation component so that results can be used to draw judgements about the performance of the project evaluated, and to provide project design guidance for the future. The congressional mandate requires that A.I.D.'s projects seek to demonstrate an improvement in the welfare of poor families. Too many decades of effort have gone by with attention to institutional changes, but with insufficient evidence of improvements at the family level. Family or household level impact analysis should be the core of any A.I.D. project evaluation.

c. Data for Evaluation

The importance of original project data for evaluation cannot be overemphasized. Almost all evaluations proceed without any direct data on project enterprises or households. Data gathering from households and enterprises in developing countries is a difficult and painstaking process; as long as evaluations are accepted which avoid this extra effort, there are few incentives to undertake it. A review of most project evaluation documents reveals that evaluators saw their role as interviewing host country and C.I.D. officials to glean their opinions as to what

happened. This collection of official impressions and opinions, linked with at times insightful observations about the institutional process have come to be accepted as adequate "Project Evaluations." There are exceptions to this general rule, and it is important to note that these exceptions are more distinguished from the rule by the data they gathered than by the methods they used to analyze it. The gathering of the basic data, not its interpretation, is the hardest part of an adequate evaluation. More effort needs to be made in developing usable data gathering methods than in refining statistical techniques for evaluation analysis. If the data gathering effort is poorly structured and inadequately controlled, no amount of sophisticated analysis will be able to salvage usable results

The core of a good evaluation is an appropriately designed and carefully managed original data gathering process at the enterprise level. While many other elements are necessary, this segment will carry the system if done correctly, and ruin it if done incorrectly. The central issues which A.I.D. rural enterprise project evaluation must focus upon are few and should not be lost as discussion seeks its simplest outlet in institutional and organizational examinations. The objective of evaluation should be to determine if target households and enterprises obtained increased income and non-income welfare as a result of the project intervention. Since the impact to be measured is at the household and enterprise level, the achievement of these objectives requires household and enterprise level data.

d. Comparison Methods for Evaluation

The most practical method to determine whether project objectives have been achieved in target households, enterprises, or institutions is by using comparisons. This is both an analytical and a data gathering method. The data themselves must be gathered in such a way as to permit the correct comparisons. The comparing task is that of gathering comparable data and comparing the right things at the right time. The analytical methods described in the next section add very little to the comparisons which could be made in the raw data if it is gathered correctly.

There are basically two types of comparisons which can be harnessed to provide conclusions on project impacts for evaluation purposes. The first is comparisons of project participant households, enterprises, or institutions over time in "before and after" fashion. The second is comparisons between participants and nonparticipants with similar characteristics. In the first type (over time comparisons) we are attempting to see if the project has changed the participant entity from what it was before, with the implication (later to be examined) that the difference is "caused" by the project. This type of comparison of the same household, enterprise or institution over time is termed a "longitudinal" comparison. In the other case, where participant enterprises are compared with similar nonparticipant enterprises, we wish to observe differences, which by implication are "caused" by the project, since it is the only difference between the two enterprises. This comparison made at the same point in time between two different households, or enterprises, is termed a "cross-sectional" comparison.

In both the longitudinal and the cross-sectional comparison, the analyst and data gatherer are trying to isolate project influences from the endless other influences which may change households or enterprises, in order to identify changes which are reasonably "caused" by the project. Since no one believes in single factor causation, that is that any effect is "caused" by any single factor, the project evaluator is not looking for what a logician may term true "cause." Instead, evaluation analyzes "project associated impacts," "changes related to this project," or changes "strongly influenced" by the project. The process of isolating project influences from all others is an imperfect one, but it is an inescapable struggle if project choices are to be enlightened by project experience.

CHAPTER TWO: INCOME AND EMPLOYMENT POTENTIAL OF AGRIBUSINESS AND RURAL ENTERPRISE PROJECTS FOR THE RURAL POOR

As agricultural output increases, new opportunities develop for providing goods, services, and markets in rural areas. Farmers require additional farm inputs and processing and marketing facilities for outputs. In addition, rising rural incomes create new demand for consumer products. By providing a supportive environment for rural based enterprises, governments can potentially improve the welfare of rural populations and further stimulate agricultural production. Following is a discussion of how agribusiness and rural enterprises can contribute to the overall economy and what mechanisms have been used in attempts to stimulate their development.

A. Definition

The term "agribusiness/rural enterprise" is used in this manual to refer to the small and medium rural enterprise (SMRE) located in a non-metropolitan area. Defining "small" and "medium" is difficult as the term has different implications in each country. In Ecuador, for example, "small" has been defined as those enterprises with less than $11,000 in fixed assets, while in Korea the term is used to refer to firms with less than $200,000.[2.1]

Working definitions which would encompass SMREs best serving A.I.D.'s priority interests should include three dimensions: number of workers, fixed assets, and labor intensity. Small scale enterprises for A.I.D. priority would be those with a maximum of 20 workers, $50,000 in total assets, and maximum capital costs per workplace provided of $5,000. A workplace should be defined as 12 person-months of work, not by the number of employees or workers. Medium scale A.I.D. priority enterprises would be those with a maximum of 150 workers, maximum of $500,000 in total assets and maximum capital costs for providing one workplace of $15,000. (It should be noted that medium scale enterprises in particular may provide substantial indirect employment which should be considered when evaluating labor intensity.)

While these definitions are admittedly arbitrary, they attempt to capture those types of agribusiness/rural enterprises with the largest potential for the achievement of A.I.D. objectives. There is a need for exclusionary definitions in A.I.D.'s operations because of the very real tendency in all countries for the larger enterprise to be more agile in obtaining scarce resources, money, and other assistance. If there are no restrictions on the types of enterprises to be included, or if the limits are set so that few enterprise types are excluded, the bulk of the assistance may tend to be concentrated very near the upper limit.

The measure of labor intensity, i.e., capital costs per workplace created, is important since size and locational characteristics do not determine the cost per job for a given enterprise. Labor intensity, for example, varies

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2.1/ United Nations Industrial Development Organization, *Technical Services for Small Scale Industry* (New York: United Nations, 1970), p. 7.

much more widely by product types than by scale of operation or location. The income potential of rural enterprises for the poor (however measured) shows significant change depending on the type of industry. This is not to say that scale and location are not important characteristics which should be used to define an area of interest to the Agency, but only to caution against the exclusive use of these characteristics in determining the boundaries of that interest. Smaller scale does tend to increase labor intensity,[2 2] rural industries are on the average more labor intensive, yet these averages conceal large differences between the labor intensity and income potential of different product and service types of enterprises For example, the range in capital required to provide one workplace varies widely within the SMRE subsector types A study in El Salvador indicated that approximately one-third of the small enterprise product types require less than $1,000 per worker, approximately half from two to eight times that much, and a small but not unimportant number from $8,000-$15,000[2 3] It is therefore important to segment the SMRE group into subgroups, not only by fixed assets and employment levels, but also according to their labor intensity in order to determine which set of SMREs best meets A I D 's objectives

As the nature of specific industries (i e , size, location, and labor intensity) varies by country situations, no attempt will be made to define or limit the types of industries to be emphasized SMREs considered for project support should initially include all enterprises found in nonmetropolitan areas Many of this group will not produce a product, but rather provide marketing, transport, or other services. At least one third of the priority SMREs in most developing countries will come from the service category Food, fiber, and wood processing make up almost all of the remaining priority small scale enterprises, and only a very small percentage consists of the handicraft products. SMREs may range from very small, craftsman type operations to fairly sophisticated businesses with complex internal organization and production processes.[2.4] (See Table 2 1)

B Role in Developing Economy

SMREs can play an important role in a developing economy, though their ability to do so depends on the existence of an adequate environment to support SMRE growth As the largest percentage of SMREs will generally be dependent on the demand of the domestic population for SMRE goods, development of SMREs requires the existence, or at least the simultaneous development of, an expanding agricultural sector. Stagnation or slow growth in agriculture will generally restrict opportunity for substantial development of new or existing enterprises.

2.2/ In a World Bank study of the characteristics of 315 sub projects financed by that institution through development finance companies (most of which were submitted for financing in 1975), the following was found:

> "The correlation between firm size and the employment created shows a surprisingly good fit in a logarithmic regression analysis: $R^2 = 0.50$
>
> $$Y = 1.56\ X^{0.65}$$
>
> where Y = number of employees
> X = fixed assets of sponsoring firms in thousands of dollars
>
> The size of the exponent (1) indicates a diminishing rate of employment growth as company size increases above a certain level ... Although the sample sizes for each subgroup are small, the data tend to confirm a relative greater labor intensity in smaller-scale operations and a significantly greater capital intensity in companies with fixed assets over $2 million."

World Bank, *Employment and Development of Small Enterprises* (Washington, D C · World Bank, 1978), p 74

2 3/ S Daines, *El Salvador Agroindustrial Profile*, A I.D Mission to El Salvador, 1977 1965 Data for India show the amount of capital per employee in some groups of small scale industries to be 13 times greater than others *Employment and Development of Small Enterprises*, p 66

2 4/ An 11 country comparison of the composition of non-farm rural employment shows some similarities as well as pronounced differences. (See Table 2 2)

Table 2-1
Composition of Rural Nonfarm Employment, Selected Countries

Sector	Zambia[a] (1975)	Nigeria[b] (1966)	India (1966-67)	West Malaysis (1970)	Indonesia (1971)	Philippines (1970)	Republic of Korea (1970)	Taiwan[c] (1966)	Chile (1970)	Colombia (1970)	Brazil (1970)
	(percentage)										
Manufacturing	10.4	49.0	38.7	15.3[d]	24.7	34.1	30.3	23.0	19.4	33.0	24.1
Construction	12.1		13.6	3.7	4.7	10.7	10.3	3.2	10.4	8.4	14.7
Utilities	2.8	n.a.	0.5	1.3	4.4[e]	0.4	0.6	0.9	1.1	0.4	0.9
Commerce	34.9	25.3	13.6	15.3	29.1	15.2	23.4	11.5	10.1	18.9	12.9
Transport	5.1	6.6	4.7	5.6	– [e]	9.6	5.7	4.7	6.7	6.2	7.8
Services											
Government	31.3	19.1	24.1	12.3	22.5	30.0	8.6	25.5	26.9	33.0	1.7
Other				16.3			20.6	17.9			31.9
Miscellaneous	3.5	–	4.7	30.2	14.5	–	0.6	13.4	25.4	–	6.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: Details may not add to totals due to rounding.
[a]Data are for rural province of Puapula.
[b]Rural districts of Ifo, Otta, and Ilaro in Western state. Data include rural towns.
[c]Includes rural towns.
[d]Excludes rubber processing.
[e]Data on transport, communications, and utilities are combined together in the Indonesia data.
Source: Anderson, D., and M. W. Leiserson, **Rural Enterprise and Nonfarm Employment** (Washington, D.C.: World Bank, 1978), p. 24.

In general, the potential contributions which SMRE can make to a country's economy include the following: First, as SMRE usually tend to be more labor intensive than larger enterprises, the opportunities for increasing rural employment can be maximized by encouraging SMRE development. As most developing countries underutilize their rural populations by 25-50 percent, the reduction of this waste of human resources and the stream of attendant economic and social ills which it carries in its wake must be a first priority for the Agency. Much of the problem can and should be attacked through agriculture directly; many of the rural poor families are small farmers and will benefit directly from programs aimed at expanding and improving their production. Yet direct agriculture cannot hope to absorb all of the existing, and expanding, rural labor force. Recent research indicates, "Data from Asia indicate that in all the countries surveyed the landless and near landless constitute a majority of the labor force, the figures approach 90% in Bangladesh and Pakistan. In every country in Latin America the landless and near landless are a majority, exceeding 80% in Bolivia, El Salvador, Guatemala and the Dominican Republic. At prevailing rates of population growth and allowing for net outmigration from rural areas of one-third of the projected population increase, the rural labor force will grow by at least 50% in most of these countries by the end of the century.[2.5] Rural enterprise projects of all types present a viable and indeed critical alternative to providing productive workplaces for rural laborers. In some geographical areas, they may also have the advantage of opening employment opportunities for women who may be culturally or economically excluded from direct agricultural pursuits.

2.5/ Milton Esman and Associates, *The Landless and Near Landless in Developing Countries* (Ithaca: Cornell University, 1977), p. 2

Second, SMREs may contribute to the income and employment of small farm families. To begin with, it has been demonstrated in many countries that the most profitable alternatives for small farmers are intensive crops which carry attendant high risks, involve increased credit, require post-harvest processing and/or efficient marketing links to prevent massive losses through spoilage. SMREs involved in processing and marketing can be catalytic in allowing small farmers to pursue this high income alternative. In fact, in many cases it is the SMRE development which precedes the small farmer entrance into intensive crop production. SMREs can open markets, provide credit and technical links to small farmers which will directly expand the employment of both farm and landless rural families in agricultural production. In addition, on-farm enterprises owned and managed by the small farm family can absorb slack labor during the off season, and provide additional income sources from added value to farm production. Capturing as much income as possible from adding value to farm production before it crosses the farm gate may be an important income alternative in some commodities. Livestock, fiber and wood products are the best commodities for on-farm processing enterprises.

Third, SMREs have the potential to improve income distribution by increasing the number of workers participating in the labor force, improving income possibilities for small farmers, and, in the case of very small establishments, providing landless families with opportunities to become entrepreneurs rather than laborers. New opportunities for the landless are particularly important in LDCs where expanding rural populations and sluggish economic growth have resulted in a large and increasing pool of unemployed workers. While product markets have remained reasonably responsive and prices for products have risen consistently, wages have not. This situation, characteristic of much of the developing world, has meant that people whose income comes from the sale of products in the product markets have a brighter potential future than those who must enter the depressed labor markets for their income.

In both Guatemala and El Salvador the small farmer makes almost twice as much income from each day productively worked on his farm as he makes from each day worked as a laborer, due largely to this disparity between the labor and product markets. Hence, employment inside his farm should be looked to as a more attractive income alternative than outside. For the landless, more income will come to laborer-entrepreneurs in most depressed labor market situations than to laborers alone. Attention has focused in many international development institutions on the plight of the landless rural families who constitute a large proportion of the rural poor, and probably the poorest of the rural poor. More than one-half of all rural poor are without income productive assets except their own labor, and are thus locked into obtaining what income they can from the depressed labor markets. One of the largest potential contributions of the very small enterprises is to convert these landless laborer families into small scale entrepreneurs and allow them to enter product, not labor, markets for their incomes.

In attempting to evaluate the target group potential of SMREs, some analysts have measured labor productivity, and finding it significantly lower in small scale establishments, have reached the incorrect conclusion that they had little income potential In both El Salvador and Guatemala, labor productivity is about four or five times as high in large scale enterprises than in small scale ones, and one might think therefore that it would be better to expand large scale enterprises and provide increased benefits to the rural poor by employing them rather than to spread inefficiency by emphasizing small scale enterprise expansion. This argument ignores two important facts usually characteristic of the rural sector in developing countries. First, much of the added labor productivity is due to substitution of capital for labor, not increased labor efficiency, and may result in larger payments to owners of capital, while laborers stay at the minimum wage floor. Second, even at lower labor efficiencies, laborers will capture a

larger share of income in very small scale laborer owned and operated enterprises. Empirical studies[2.6] have indicated that in food, clothing and wood products, even though labor productivity is one-fourth that of large scale establishments, net income per worker is 15-55 percent higher in firms with less than five workers.

Fourth, by focusing on areas outside of the major metropolitan areas, governments can encourage decentralization of industrial development. Decentralization is a factor in improved income distribution and can contribute to stemming the migration to metropolitan areas. The potential of small and medium scale rural industry to decentralize the process and benefits of growth was found to be particularly important in studies on Brazil and Colombia.[2.7]

Finally, SMRE in appropriate lines of activity can contribute to growth of the overall economy by being efficient users of capital. Though the evidence is not conclusive, studies[2.8] do indicate that in many industries, the output per unit of capital is higher for small scale than large scale enterprises. Hence, in industries where this holds true, support of labor intensive SMRE will not be at the cost of increased output, but will rather be the best means to achieve improved social and economic welfare.

C. Selective Support of SMRE Development

If an underlying dynamism exists in the agricultural sector, SMRE growth will undoubtedly occur without government efforts. Reasonable support, however, has the potential to maximize their development in appropriate industries by improving the efficiency and effectiveness of their operations. Generally, specific efforts to support SMRE development will realize the best results in areas where SMRE enjoy competitive advantages. Trying to stimulate SMRE which have significant employment potential but which have no competitive advantage vis-a-vis larger, metropolitan enterprises often proves difficult, if not impossible, and fosters inefficiency.

Morse and Staley in Modern Small Industry for Development identify three primary influences which significantly bear on the relative competitive advantages of small and large enterprises: location, processes, and markets. Specifically, they argue that smaller enterprises are most suited where factors encourage dispersed locations, where scale economies are not pronounced or process advantages exist in small scale operations, and where markets are small or highly differentiated.

Locational influences favoring small and dispersed enterprises might include industries where: a) local markets and high transfer costs make localized production more economical (e.g., prepared animal feed, concrete blocks and bricks, ice cream, and soft drinks), b) raw material is dispersed (e.g., butter, cheese, grease, tallow, or wood products), and c) localized services are required to ensure timely and flexible customer contact (e.g., printing, typesetting, grain storage, and milling).

Favorable process influences include those where: a) operations are based on localized skills, which may include craft or precision handwork (e.g., furniture, leather goods, and blacksmithing), b) manufacturing operations are separable (e.g., machine shop products, castings, and dies and tools), and c) operations require simple assembly, mixing, and finishing (e.g., food flavorings, footwear, fertilizer mixing, and wood products).

2.6/ See S. Daines, *El Salvador Agroindustrial Profile,* AID Mission to El Salvador, 1977, p. 26.

2.7/ See S. Daines, "Analysis of Industrial Structure," Technology and Productivity," in *The Food Processing Sector of Brazil* (Cambridge: Massachusetts Institute of Technology, CPA, 1975),126 pp.

2.8/ See Eicher et al., *West Africa;* and Daines, *Brazil, El Salvador, Costa Rica. Agroindustrial Profile* (San Jose: USAID 1976).

Industries with market influences favoring SMRE would include those with: a) differentiated products which have low scale economies (e.g., women's dresses), and b) small markets which are best served by a locally based enterprise (e.g., fresh/frozen fish, cottonseed oil mills, carts and wheelbarrows).[2.9]

In general, SMRE engaged in activities in these classifications should enjoy a natural competitive advantage. By direct support selectively to these SMRE, government or other donor efforts have the potential to stimulate those enterprises which can theoretically make the most positive contribution to the overall economy.

D Problems Common to SMRE

The form of government support will vary with the problems specific to that country's SMRE sector. Following is a general discussion of problems which are common in many industries in many countries, though they may not be universal. Some of these problems are shared by large scale operations. In general, however, the problems are more pronounced for SMRE which, by virtue of their smaller size, are unable to resolve many of them without external support, be it private or public. Common difficulties include:

1. Government Disincentives: One of the most serious problems faced by SMRE are disincentives established through government actions. These can include:

   a. Distortion in factor prices which may result in investment in large, overly capital-intensive operations. Artificially low interest rates and overvalued foreign exchange make purchase of capital equipment more attractive when in fact abundant, cheap labor and scarce capital should favor the development of labor-intensive operations

   b. Burdensome rules and regulations such as those requiring overly detailed reports, records and licensing, which can consume valuable time and may discourage growth, as many of these requirements often become more involved as the firm grows larger.

   c. Taxes and tariffs which favor large firms, giving them artificial advantages in comparison to SMRE. Also, a tax structure which discourages growth of small enterprises by rapidly increasing taxes once the enterprise has reached a certain size.

2. Management: In many small firms, one individual is responsible for the production, management, marking and finance operations. The entrepreneur, who, for example, may be a skilled craftsman, often lacks expertise in all of these areas. Although the firm's operations may appear to be fairly straightforward, e.g., dressmaking, the entrepreneur still has to make decisions relating to each of the above functions, e.g., how many machines to purchase or workers to hire, how much money to borrow, and how to better sell his or her services.

The ill-informed businessperson can easily make decisions resulting in an inefficient use of resources and thereby seriously affect the enterprise's ability to compete effectively. These entrepreneurs are often reluctant to accept outside assistance and are unable to identify their specific problems. Many of the other difficulties outlined below stem largely from this lack of specialized management.

3. Technical Information: The entrepreneur's limitations are further aggravated by the lack of access to current technical information. Consequently, decisions regarding technology, production processes and planning,

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2.9/ E. Staley and R. Morse, *Modern Small Industry for Developing Countries* (New York: McGraw-Hill, 1965), pp. 112-124.

inventory levels, and related facts are often based on outdated and inefficient practices still in use in the immediate vicinity.

4. Marketing: Whereas large firms usually have the staff and contacts to keep abreast of market developments, rural, smaller firms do not. Consequently, their knowledge of new or changing opportunities is limited to their immediate environs. In addition, large firms can afford transport and storage facilities, advertising and product development efforts which an individual SMRE again cannot.

5. Credit: Most Small Scale Enterprises (SSE) and, to a slightly lesser degree, Medium Scale Enterprises (MSE) are forced to rely on personal savings, money from friends or relatives, and moneylenders. They therefore find it difficult to obtain working capital or long term credit needed for capital investment on an adequate or timely basis and on reasonable terms.

Formal credit channels are often closed for several reasons. The general problems faced by rural industry, compounded by the lack of accurate accounting records, make it higher risk for credit institutions which can lend to more stable customers or even invest funds in other money instruments. Also, lending to SMREs rather than larger, metropolitan-based industry usually means higher administrative costs due to the smaller size of the loan and the additional time bank personnel may need to spend in reviewing, monitoring, and assisting the rural customer. Banking practices further complicate the situation. They often require substantial collateral to insure the loan, and commercial banks in particular are often unable or reluctant to lend on a long term basis because most of their funds are short or medium term.

Government policies tend to aggravate the situation further when policies such as those discussed above foster "over-development" of larger, more capital-intensive operations and thereby make them favored customers.

6. Raw Materials/Equipment: Large-scale enterprises usually enjoy several advantages in purchasing raw materials and equipment; they can make bulk purchases, have specialized procurement staffs, and have more political, social, and financial influence with their government and suppliers. This affords a significant price advantage and invaluable control in LDCs where the supplier and sales networks are often inadequately developed and raw materials and equipment are usually in chronic short supply.[2.10]

7. Socio-cultural factors: Socio-cultural factors may be a serious handicap to the development of SMREs. The rural entrepreneur may be expected to share his/her wealth among relatives, which limits funds available for reinvestment; profits may be discouraged by the community, thereby discouraging aggressiveness and growth; leisure time may be highly regarded and consequently efforts are discouraged to utilize available equipment at full capacity, etc. In addition, the social structure in some countries may be such that an elite can control access to government, sources of credit and supplies, markets, etc., so effectively that it denies SMREs needed support for development. These considerations may seriously affect any program intended to develop SMREs and should be carefully evaluated.

8. Infrastructure: Many of the less traditional and larger SMREs require access to basic infrastructure such as roads, electricity, and water. Inadequate or unreliable access to such amenities can seriously hamper or even prevent new SMRE growth. Hence, external efforts to stimulate rural enterprises may often follow infrastructure development.

2.10/ Staley and Morse, *op. cit.*, p. 379.

CHAPTER THREE: PUBLIC POLICY OVERVIEW

Introduction

A considerable public policy structure participates in framing the environment within which SMREs function in any country. The policy setting[3.1] (including the lack thereof) must be a part of the knowledge base with which the project planner avails himself prior to further identification of alternative project interventions.

Policies of obvious concern to the project planner are those that are targeted directly to SMREs, and impact either negatively or positively on viability and potential for growth of the subsector. Others that are not quite so obvious, but nevertheless affect the climate within which SMREs operate are: 1) general economic and trade policies that directly or indirectly affect the economic climate within which SMREs compete for raw materials, factors of production, and markets; and 2) policies affecting other subsectors strongly linked to SMREs as suppliers of inputs or purchasers of outputs.

A thorough knowledge of the relevant public policy structure is important to the project planner for two reasons. First, since existing public policies heavily influence the environment within which SMREs operate, the project planner must understand which existing policies actively constrain the ability of SMREs to be viable and expand. Identification of such policy constraints suggest to the planner possible policy interventions that may become conditions precedent to project implementation. Or the analysis of constraining policies, and formulation and implementation of policy alternatives for alleviating such constraints, often can become the purpose of the project itself.

Second, policy gaps need to be identified which offer opportunities for formulating and implementing new policies that can impact on the viability and expansion potential of the entire SMRE subsector.

An overview of characteristics to be found in some of the more important policy areas is discussed in this chapter. The purpose of the overview is to make project planners aware of what to look for in reviewing public policy, and of some opportunities that might be available for project interventions at the policy level.

A. Credit Policy

Credit is a tool by which adjustments in all factors of production can be achieved. Thus, public policies affecting the availability and conditions of credit and capital supply to SMREs and agroindustry are particularly important.

In looking at credit policies, it is important to examine not only those policies that seek to make credit accessible to SMREs in acceptable terms, but also those policies which access large-scale enterprises to supplies of capital (often at subsidized interest rates) that generally cannot be tapped by smaller rural enterprises. Capital mar-

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3.1 Public policies are articulated in a number of places: in laws and governmental regulations, in internal regulations of implementing institutions, and in the practices of these institutions.

kets in less developed countries often are not well developed, being generally limited to the capital city in smaller countries, and generally not reaching beyond major regional centers in larger countries. Although bank branches may exist in more remote areas, they generally exist primarily as depositories for funds and to facilitate noncredit transactions between the hinterland and the capital city.

In many cases, large scale enterprises have access not only to major national capital markets, but to international capital markets as well. In addition, special government industrial promotion programs often provide special lines of credit at subsidized interest rates. Such programs usually are administered from one office in the capital city or a limited number of offices in other major commercial centers. Paperwork generally is substantial and insurmountable for many SMREs. Because of geographic isolation and the sophistication required to access these special lines of credit, SMREs are not benefited by such programs, although they are not formally excluded. Their situation can be characterized as one of "benign neglect." Nevertheless, the net result of such programs often can be negative for SMREs, since they enhance the relative competitive position of larger-scale enterprises.[3.2]

As credit policies are examined, both in terms of existing policies and apparent gaps for targeting credit to SMREs, it is important to be aware of the potential pitfalls of what has been termed the "need-creed" syndrome.[3.3] It is common to assume that all SMREs need loan funds to purchase raw materials and equipment, to finance inventories and marketing costs, etc. The view is that because of meager internal resources, the small entrepreneur automatically needs outside resources in order to modernize and expand.

Von Pischke points out some assumptions upon which this need-creed is based which may not be valid in specific rural enterprise situations (although Von Pischke is addressing small farmer credit, the principles appear to apply equally well to small rural enterprise credit). SMRE credit project proposals often assume that prior to the project, there were no stocks and flows in the enterprises to be assisted, or that they are so small as to foreclose any realistic alternatives, and that financial input requirements are relatively large and indivisible. However, it often may be the case that improvements in the output and profitability of the enterprise do not require credit. Or it may be that improvements can occur only gradually by a succession of small increments. Incremental change might well be financed largely through re-investment of savings of the enterprises themselves.

The point is that credit should not be looked on as one of the **essentials** of SMRE development, as are availability of raw materials, markets for output, managerial capability, etc. If these **essentials** do exist, then credit may **accelerate** the growth of SMREs, if the potential exists. Rural entrepreneurs may not lack capital or credit so much as the motivation to use resources to develop their enterprises. There is ample evidence that credit programs for small businesses often can be wasteful of funds, or even counterproductive.[3.4]

Despite the pitfalls, credit may be an important component of a project intervention aimed at assuring that the essentials to successful SMRE growth and development are in place. Credit policies then become important variables to be taken into account by the project planner.

3.2/ In D. Kochav et al., *Financing the Development of Small-Scale Industries* (Washington, D.C.: World Bank, 1974).

3.3/ A term coined for application to small farmer credit needs by J. D. Von Pischke in "A Critical Survey of Approaches to the Role of Credit in Smallholder Development (paper presented to Eastern Africa Agricultural Economics Society Conference in Lusaka, Zambia, May, 1974).

3.4/ See references in Malcolm Harper, "The Employment of Finance in Small Business," *Journal of Development Studies*, 11, No. 4 (July, 1975), p. 367.

Credit policies generally fall into one of the following categories:

1. Policies related to credit terms.
2. Policies related to channels through which credit flows.
3. Other credit-related public policy measures.

1. Credit Terms

The terms under which credit is offered often determine whether or not it can be useful to SMREs. Interest rates, security requirements, repayment terms (length of loan and repayment flexibility), and loan purposes are the major policy components of credit terms.

Considerable attention has been given in the development literature to the question of interest rates for small farmers and other small entrepreneurs.[3.5] In the past, many LDCs, often at the urging of donor agencies, have instituted credit programs for small farmers and other small enterprises at subsidized interest rates; i.e., interest rates that do not cover the opportunity cost of capital, the cost of administering the credit, and the cost of risk (and default). The rationale is that small enterprises are operated by poor people who ought not be charged interest rates high enough to cover the lender's costs because they cannot afford it, or because they need to be introduced to the borrowing process gradually.

The concept that poor producers need low interest rates to be able to use credit became a truism for many small farmer and small enterprise credit programs. In more recent years, many specialists have marshalled impressive evidence that this may not be the case, and that subsidized interest rates may be self-defeating in terms of making credit effectively available to these target groups. It should be kept in mind that if the profitability of the credit investment depends upon a few percentage points of interest, the investment probably is not sufficiently profitable to justify the use of credit in the first place.[3.6]

The most telling argument in favor of charging true interest rates is that economic viability of the lending institution cannot otherwise be sustained. Even in the case of a state lending institution, the government is not likely to continually replace the capital of a subsidized credit fund, and it will eventually become depleted.[3.7] Additionally, a subsidized credit fund administered by a state institution may draw customers from cooperative and other private institutions, thereby putting these sources of credit out of business, or seriously limiting their ability to capitalize and expand. Once the state fund is depleted, the client group has neither the state subsidized credit nor a private institution in a position to serve expanding credit needs. Furthermore, even if a subsidized credit fund can be maintained at a given level, there is no opportunity to capitalize earnings and thereby expand the funds available for lending to more clients.

The project planner should carefully weigh the potentially negative aspects of a subsidized interest rate before deciding whether or not to incorporate it into a credit program.

3.5/ M. Lipton, "Agricultural Finance and Rural Credit in Poor Countries," *World Development*, 4, No. 7 (July, 1976), pp. 543-553; and separate comments by M. Yudelman and S. Barraclough, pp. 555-559.

3.6/ P. F. D. de Araujo and R. C. Meyer, "Agricultural Credit Policy in Brazil: Objectives and Results," *American Journal of Agricultural Economics*, 59, No. 5 (December, 1977), pp. 957-961, point out distributional distortions caused by interest rate regulation.

3.7/ R. E. Soles, "Successful Rural Credit Projects in Latin America," paper presented to the 6th International Seminar on Cooperative Finance, Panama City, Panama, November, 1976.

There is one instance where subsidized interest rates may be used to improve the economic viability of lending institutions. Some projects have successfully accelerated capitalization and lending capabilities of cooperative lending institutions by providing funds on concessional terms to the national level of the organization for on-lending to local cooperatives (and in turn to members) at market rates of interest. In this manner, the national level organization is permitted to capitalize and expand services from the greater interest spread more rapidly than otherwise would have been possible. At the local level, more membership can be served, while at the same time improving economic viability of the various levels of lending institutions.[3.8]

Subsidized interest rates also may distort the purposes for which loan funds are sought and used. This may mean that scarce capital supplies are not used in their most productive way. The usual role of interest rates to serve as the rationing mechanism for distributing scarce credit to its most productive uses is subverted, and other less effective rationing mechanisms must be sought. These often become political criteria and/or the easiest loans to make and administer; e.g., the larger loans to borrowers that can offer better security.

Often, banking regulations and internal regulations of state lending institutions require that borrowers pledge some collateral as loan security. Documentation and paperwork involved in these collateral requirements, or the lack of adequate collateral will discourage or disqualify many SMREs. A more forward-looking lending policy is to emphasize repayment capacity of the borrower based on the income-producing potential of his enterprise. However, for many small enterprises, documentation of income-producing capacity also may be difficult. Alternatives include lending on the basis of reputation in the community and joint liability loans to small groups. For example, credit unions often require a borrower to have one or more guarantors who are credit union members in good standing.

The degree of flexibility in amortization arrangements may have considerable bearing on the ability of SMREs to make effective use of credit. Although lending institutions must be aggressive in encouraging repayment, it is also necessary to be sufficiently flexible to allow for rescheduling loan repayment when unforeseen circumstances warrant. Often, state lending institutions have unrealistic and inflexible repayment requirements which do not adjust to SMRE needs. This results in defaults that otherwise could be avoided. It also often leads to a large delinquent portfolio. These delinquent loans remain uncollected in many cases because of political pressures and public image, or because of lack of collection staff and capability, and the corollary high cost of enforcing collection of large numbers of small loans.

Such a situation creates problems for the lender and acts as a bar to further credit by the borrower. A clear-cut and strictly enforced policy for treating delinquencies in terms of renewal, collection, forgiveness and bad debt treatment are preferable both from the viewpoint of the borrower and the lender.

Many credit programs define a relatively narrow purpose for which loan funds may be used. There is considerable diversity in SMREs and in their credit needs. Also, most cottage-type enterprises do not distinguish between funds used in the business and funds used for family consumption. Too narrow a purpose definition in a credit program can result in lack of loan placement, or placement ostensibly for one purpose while, in fact, the funds are used for other purposes. In this respect, credit policies affecting producers of raw materials may have negative impacts on SMREs. For example, a small farmer credit program limited to loans for production of basic grains may have a negative effect on the supply of vegetables to an SMRE using them as raw materials.

3.8/ This method was implemented successfully in Guatemala. W. Rusch, F. Mann, and E. Braun, "Rural Cooperatives in Guatemala: A Study of their Development, and Evaluation of A.I.D. Projects in their Support," November, 1975.

2. *Credit Channels*

Policies related to promoting, discouraging (or neglecting) different credit channels may be of more importance to successfully accessing SMREs to adequate credit supplies than are credit terms. In fact, implementable terms depend to a certain extent upon the channels through which credit is to flow.

Noncommercial (or informal) channels supply nearly all credit to small rural enterprises in most traditional economies. Professional moneylenders, traders, raw materials suppliers, family members and friends channel most noncommercial credit to SMREs.[3.9] Another informal system that has received attention of more specialists recently is the indigenous savings and credit, or rotating credit associations or societies. Although there are many variations, these can be defined as "a group of participants who make regular contributions to a fund which is given, in whole or in part, to each member in turn."[3.10]

These informal associations appear to provide capital in many countries for members to start small rural businesses and shops.[3.11]

Informal credit systems, and especially moneylenders, often are criticized because they are considered to be exploitive and charge unusually high interest rates. However, some observers suggest that these rates may be necessary for the lender to cover the costs and risks of lending money (including covering the rate of inflation). In any event, experience has shown that it is extremely difficult for formal institutional channels to reach the poor, isolated target groups served by these informal channels. Public policy related to informal credit often attempts to limit maximum interest rates that can be charged. This usually is not effective since informal systems are difficult to monitor.

Part of the motivation for establishing formal government channels of credit is to provide poor borrowers with an alternative to being in the "grip of unscrupulous moneylenders." Yet, informal channels of credit continue to function.

An alternative policy choice is to attempt to upgrade informal channels and link them into supplies of funds that can permit expanded credit availability and result in lower interest rates because of less rationing. Bauman makes a case for integrating the indigenous savings and credit societies into the modern financial sector.[3.12] In India, banks organize so-called "chitties" that are similar in principle to these societies.[3.13]

Formal credit channels include: 1) state administered systems such as development banks and special credit programs, 2) private channels such as commercial banks and finance companies, 3) cooperatives, both service cooperatives (that not only provide supply input, marketing or other services, but also credit for financing these services) and savings and credit cooperatives (that receive savings deposits from and lend to members), and 4) mixed publicly-owned/private systems. In the latter systems, public institutions wholesale credit, while regional and local private institutions perform the intermediate distribution and local level retailing functions.

Public policies conducive to effectively accessing small rural enterprises to credit when needed and profitable are those which encourage: 1) local control and responsibility over resource allocation, 2) distribution of

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3.9/ R. K. Vepa, *Small Industries in the Seventies* (Delhi: Vikas Publications, 1971).

3.10/ F. J. A. Bouman, "Indigenous Savings and Credit Societies in the Third World," *Development Digest*, 16, No. 3 (July, 1978), p. 36.

3.11/ *Ibid.*, p. 41.

3.12/ *Ibid.*, p. 45.

3.13/ V. V. Bhatt, "Financial Innovations, Transaction Costs and Development," *Development Digest*, 16, No. 3 (July, 1978), p. 33.

credit resources through small groups or with group guarantees of repayment, 3) linkage of local institutions to capital supplies within the larger credit system, and 4) rates charged for credit that permit the various levels of institutions involved to capitalize earnings and strengthen their ability to expand credit supplies.

3. *Other Credit Policies*

Equity participation may be an important alternative to credit, per se, for some agro-industrial enterprises and other enterprises that are embarking on a nontraditional undertaking such as manufacturing of a new product where market demand depends on recent changes in the local or national economy (such as agricultural production changes). Instead of establishing a debtor-creditor relationship between the outside capital supplying institution and the local entrepreneur, the capital supplier takes shares in the business, or builds the plant and supplies the equipment on a profit-sharing basis, while sharing the business risks involved. In most cases, it is likely that the equity participation alternative is practical only for medium-size agro-business type enterprises.

Credit may be tied to some form of supervision or mandatory management advice. In fact, it may be a wise policy to include training and technical assistance for both the borrower and the lender in credit projects.[3.14]

In addition, the inclusion of other noncredit services to small borrowers may be more useful in terms of viability and growth than is the provision of credit.[3.15] Such services as bookkeeping assistance or skills training are examples of important noncredit services that can and in many cases should be coordinated with credit.

B. Agrarian Reform and Agricultural Policy

An obvious need for the SMRE subsector is raw materials and markets. The skewedness or absence thereof in the distribution of productive wealth in rural areas obviously has an impact on the local availability of raw materials from agricultural production and the size of the local market.

Present conditions and expected future trends for these two factors are of critical importance to SMREs that are linked either backwards or forwards (or both) into the local economy or into the rural sector as a whole. Agrarian reform policies may have either negative or positive effects on the size and dynamism of the supply and product markets for these SMREs.[3.16]

In cases where land previously held in absentee ownership, or previously concentrated in large units, is distributed to the former landless laborers or sharecroppers, disposable incomes in the local area may increase even if output does not increase (or even declines somewhat). This is because more of the total agricultural income is retained by local people and expended in the local area rather than being expended in the capital city or outside the country. Thus, an agrarian reform that results in nothing more than income transfer can be expected to increase local demand for goods and services. If productivity increases also are achieved as the result of programs supporting

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3.14/ Richard L. Meyer, "Financing Rural Nonfarm Enterprises in Low Income Countries," Economics and Sociology Occasional Paper No. 522, Ohio State University, Columbus, Ohio, October, 1978, p. 16.

3.15/*Ibid.*

3.16/Governmental Affairs Institute, "Managing Planned Agricultural Development," August, 1976, pp. 11-36.

agrarian reform, the increase will be even more substantial.[3.17] This results in an economic climate that should have a positive impact on SMREs that provide goods and services for local consumption.

The positive income impact of effective agrarian reform is demonstrated by the Taiwan case. There the index of farm family incomes in real terms increased from 100 to 160 in the 15-year period following the Agrarian Reform.[3.18] Further, non-agricultural incomes of farm families increased at an even greater rate than did agricultural incomes. This suggests that the stimulus of increased incomes from agriculture may have a high multiplier effect on rural nonfarm incomes.[3.19]

Of course, it may be possible that income transfers from agrarian reform will be absorbed entirely in increased on-farm consumption. In that case, the impact on SMREs may not be positive and could possibly be negative. It also is possible that an agrarian reform that creates large scale communal or collective farm enterprises could depress local demand served by SMREs, if such tenure forms are associated with centralized purchasing and marketing, and internal distribution systems, for farm worker consumption items.

Other agricultural policies can affect the raw materials supply and/or product market structure of SMREs. This is true for those depending on local markets as well as those serving broader markets.

Price policies that establish support prices for agricultural products used as raw materials may raise their costs to a point that will not permit market competitiveness for agro-industries. Or high support prices for one product may cause farmers to shift out of the production of another product which served or could serve as raw material for agro-industry.

Policies of providing agricultural inputs, or market outlets for farm production, through state-owned channels at subsidized prices of costs may preclude the establishment and expansion of private and cooperative farm input supply and output marketing firms. For example, a practice of marketing fertilizer at subsidized pricing through the state-owned agricultural development board in Guatemala results in considerable difficulties for agricultural input supply cooperatives to expand fertilizer sales to small farmers until the government adopted a program of passing on to cooperatives the subsidy margin being applied by the state-owned distribution system.[3.20]

C. Labor Laws and Employment Policy

Labor laws that impose minimum wages and relatively high levels of fringe benefits are common in LDCs. Where these encompass SMREs, they can seriously limit ability to maintain viability and expand. In many cases, such labor laws exempt enterprises under a certain size; e.g., with less than five employees. Exemptions set at low levels may be an important disincentive to expansion by SMREs, even where other factors are favorable.

Other legislation, such as unionization and contracts, severance, vacation and disability allowances, maternity leave, pensions, funeral expenses, food allowances, clothing, Sunday pay, etc., all conspire to exert an upward distortion in the price of labor which may effectively bar a significant percentage of the labor force from par-

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3.17/ It has been suggested that high yielding varieties will create more employment indirectly through services than they do directly on farms. See R Shaw, "Jobs and Agricultural Development," ODC Monograph No 3, October, 1970, p. 52.

3 18/ Yen-Tien Chang, "Land Reform and its Impact on Economic and Social Progress in Taiwan," pp. 13-16.

3.19/ Evidence from Sierra Leone supports this conclusion There it was found that a 10% increase in agricultural incomes resulted in a 16% increase in the demand for small scale industry products. C Liedholm and C. Enginna, "The Economics of Rural and Urban Small Scale Industries in Sierra Leone," Michigan State University, 1976, p. 118.

3 20/ See Guatemala Cooperative Evaluation, *op. cit.*

ticipation in employment.[3.21] Although much of this legislation does not apply to many SMREs, it may well serve as a disincentive to expansion because of concern about coming under its provisions.

Job protection provisions of labor laws, such as severance pay and disability allowances, often do apply to all non-agricultural employment. This may encourage SMREs to operate on a family labor basis, or limit outside employees to temporary hiring, in order to avoid having employees qualify for such benefits.

Government policies designed to provide employment to landless rural families may disrupt local labor markets and serve as disincentives for SMRE establishment or expansion, or actually cause existing SMREs to go out of business. This can occur when extensive public works projects are sited in areas where an equilibrium already exists in terms of employment levels.[3.22] For example, some observers believe that small rural enterprises have been negatively affected by the increased and sustained employment demand generated in many areas of Guatemala from extensive earthquake rehabilitation construction since 1976.

D. Internal Fiscal and Tax Policies

Nationally administered property and income taxes probably do not impact negatively on smaller rural enterprises in most LDCs. Small enterprises often are specifically exempted from business taxes because of their size or organizational form. Or tax administration may be inadequate to monitor any but large business enterprises.

In those cases where smaller size enterprises and unincorporated businesses are exempted by law from income or property taxation, the exemption level could serve as a deterrent to expansion beyond that size or as a deterrent to organizing as a corporation, thereby foreclosing shareholding as a form of business capitalization.

In some countries municipal license fees, other municipal rates and fees, and transaction or stamp taxes on purchases and sales documents and contracts tend to be regressive and may constitute a significant financial burden for small enterprises.

In many cases, the most important fiscal policies affecting the competitive position of SMREs in terms of raw materials and markets may be those that do not directly apply to them. Special fiscal incentive legislation has been enacted in a number of countries for encouraging establishment and major expansion of large-scale enterprises. Income tax and property tax exemptions for an establishment period, special allowances thereafter, raw materials and equipment import duty exemptions, subsidized financing, and equity or seed capital participation by the state, all have been used in LDCs to promote large-scale industrialization. SMREs often are excluded from participation in these fiscal incentives because of lack of knowledge or access, or as is more often the case, because such incentives are available only to a minimum scale of financial investment or employment.

Liedholm and Enginna, in their study of fiscal policies in Sierra Leone, found the impacts on small enterprises to be seriously negative.[3.23] There, certain large scale firms can qualify for a package of fiscal benefits as follows:

1. Exception from income taxes for 3 to 10 years.
2. Deferral of depreciation allowances until after the tax exemption period.

3.21/ D. T. Geltman and G. E. Landers, "Obstacles to Labor Absorption in a Developing Economy: Colombia, a Case in Point," *Journal of Interamerican Studies and World Affairs*, 15, No. 3 (August, 1973), p. 311

3.22/ World Bank, "Rural Enterprise and Nonfarm Employment," p. 46. Other national and local government projects and services in rural areas also are important employers and provide about 20% of all nonfarm employment.

3.23/ *Op. cit.*, pp. 111-112.

3. Exemption from import duties on building materials for plant construction, equipment, and raw or semi-processed production materials.

Small firms cannot qualify under this legislation. They find themselves at a considerable competitive disadvantage, especially where imported production materials are used.

Similarly, the structure of import duties in some countries may work against smaller firms. Again in Sierra Leone, Liedholm and Enginna found that in many cases the kinds of imported products used by small industries often have a high duty relative to many raw materials more common to larger scale industries.

E. Marketing Policy

Public policies in most LDCs impact significantly not only on the markets supplying many products of SMREs, but also on the markets for their raw materials.

For enterprises that trade in or process agricultural products, government intervention in the marketplace, through direct buying or controlled prices, may distort prices in a way that discourages use of these products as raw materials, or discourages trading in them. Onerous hoarding and speculation laws are major deterrents to private (including cooperative) sector entry into the field of agricultural marketing.

Perhaps one of the most effective policy areas for direct government impact on market opportunities for SMREs is in government procurement. SMREs often can be reliable and competitive suppliers for a wide range of products purchased by government agencies. Hospital and office furniture, school equipment, tools, uniforms, and many food items can be readily supplied by SMREs.

Examples of substantial impetus to SMREs through government procurement are found in India, Botswana, and Lesotho.[3.24]

Policies that promote subcontracting between large and small firms have been found to be effective stimulants to SMRE development in a number of countries.[3.25] Government policies to promote subcontracting include provision of brokerage services, technical assistance for quality control and design work, and skills training.[3.26] It may be possible to relate certain tax incentives and import or export exemptions for large firms to their linkages with SMREs.

Some cottage industries and enterprises producing for local markets may be able to tap demand beyond the local area. Linkage into the larger market often is extremely difficult or impossible for them. Market information may be helpful to assist the enterpriser to expand beyond local markets in these cases. Often, however, the lack of a marketing network to reach into rural areas for products and place them in the urban national and international markets limits the usefulness of market information to SMREs. The establishment of publicly-owned outlets, or assistance in organizing cooperative marketing networks, constitute policy options available to assist in removing these constraints. Brokerage and promotion functions to make potential urban and international wholesale buyers aware of product opportunities also can be helpful.[3.27]

3.24/ World Bank, *Employment and Development of Small Enterprises*, p. 25.

3.25/ *Ibid.*, p. 25. Japan, Korea, India and several countries in Latin America are cited as examples. See also Grant, *op. cit.*, pp. 18-19.

3.26/ E. Staley and R. Morse, *Modern Small Industry for Developing Countries* (New York: McGraw Hill, 1965), p. 381.

3.27/ *Ibid.*, pp. 379-381.

Perhaps the most important stimulus to SMRE development is effective and expanding local demand. This, of course, is influenced primarily by general economic policies and agricultural development policies that improve agricultural incomes and income distribution within rural areas. Investment in rural economic and social infrastructure, and policies affecting terms of trade between agriculture and urban sectors, are important determinants of demand levels and rate of increase in demand for SMRE products in rural areas.

F Regulatory and Incentive Structures

Health and sanitary regulations, transport regulations, controls on the movement of goods, including municipal government licenses and fees for entry and for doing business, all tend to be regressive in nature. Thus, they have relatively greater negative impacts on SMREs than on larger businesses. In many LDCs these types of regulations do not provide the necessary flexibility to distinguish between different scales of enterprises and different markets for goods. Often, enforcement is erratic or the degree of enforcement depends upon friendships or extralegal payments. Paperwork required for compliance with or exemption from certain regulations may be only an irritant to a large business, whereas it becomes an excessive burden for smaller enterprises.

Regulations surrounding qualification for special incentives, such as import exemptions, access to foreign exchange, special capital and credit programs, or technical assistance programs, even where ostensibly including SMREs, may have eligibility requirements that discourage or make impossible participation by many small firms. Such eligibility requirements may include such things as availability of financial accounts and documents, certified audits, income and sales projections, required corporate or cooperative form of business organization, etc.

In some countries, laws against hoarding and speculation can be a major deterrent to enterprises that need to store such products either for resale or for processing.

A number of observers suggest that important incentives for the growth of SMREs are those that: 1) facilitate access to information about opportunities, raw materials and markets; 2) assist in dealing with government offices that regulate or offer potential services; and 3) provide management and technical services and training. Effective responses to these needs often are more important in promoting SMRE growth than are financial services.[3.28] Indirect incentives also can be effective in many country situations. This may be particularly true where substantial policy constraints exist. In rural areas where basic infrastructure for economic and social development is lacking, investments in roads, electricity, schools, health, and community facilities may be a prerequisite to significant growth in SMREs.[3.29]

Regardless of the particular concept or incentive instruments to be promoted, an essential condition for successfully responding to SMRE development needs is the establishment of an institutional framework responsive to local issues and capable of delivering the assistance at the local level.[3.30]

3.28/Meyer, P. 16; Von Pischke, pp. 11-12; Harper, pp. 368-375.

3.29/D. Anderson and M. W. Leiserson, "Rural Enterprise and Nonfarm Employment," January, 1978, pp. 40-44 ; Governmental Affairs Institute, *op. cit.*, pp. IX-35; J. P. Grant, "Development: The End of Trickle Down?," *Foreign Policy*, 12 (Fall, 1973), pp. 19-20.

3.30/*Ibid.*, p. 39.

G. *Industrialization, International Trade Policy, and SMREs*

The relationship of past industrialization policies, international trade policy, and SMREs bears analysis in this public policy overview for several reasons. First, the SMRE strategy has recently emerged out of the industrialization policies pursued by the LDCs over the last 25 years, and its place as an increasingly accepted strategy can be best appreciated when seen within this broader context. As these industrialization policies have been, and continue to be, intimately linked with external sector policies, they are presented together in order to adequately describe this broader picture. Secondly, for some SMRE activities and agribusiness projects, the external sector must be taken into account in planning an intervention or their potential success will be seriously diminished. While traditional cost/benefit analysis will take some of these trade policy factors into account, it will not consider others which will be fundamental for an effective intervention. This section will first discuss the evolution of industrialization policies in LDCs and the emerging role of SMREs in that strategy, and then treat some specific trade policies necessary for consideration in designing appropriate interventions.

After World War II, increased attention and international efforts were focused on the more rapid development of the poorer nations. The developed countries had achieved high rates of growth through the spread of modern technology and the development of large scale manufacturing, so development planners argued that the developing countries could accelerate their own growth by doing the same. Through international assistance and borrowing in international capital markets, the LDCs could raise the capital for such industrialization which would increase productivity levels per worker, permitting incomes to rise. Since, as people's incomes rise a diminishing proportion is spent on food and an increasing share on manufactured goods, demand for industrial goods would increase as incomes rose and agriculture would play the marginal role of providing food for the growing industrial working class. Likewise, as agriculture became more productive, the increasing freed farm laborer force would find employment in the growing industrial sector.[3.31]

Industrialization in the LDCs presented the problem, however, that these countries already imported manufactured goods from the developed countries and could not hope to compete with them. The strategy, therefore, was to produce primarily for the domestic market by substituting locally produced manufacturers for those being imported from the developed countries—"import substitution industrialization."[3.32] This was accomplished by

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3.31/See G. Ranis and J. C. H. Rei, "A Theory of Economic Development," *American Economic Review*, 51, No. 4 (September, 1961), pp. 533-565; D. W. Jorgenson, "The Development of the Dual Economy," *Economic Journal*, 71, No. 282 (June, 1961), pp. 309-334; and his "Surplus Agricultural Labor and Development of the Dual Economy," *Oxford Economic Papers*, 19, No. 3 (November, 1967), pp. 288-312.

On the use of elasticities, see United Nations, *World Economic Survey, 1962* (New York, 1962), where a number of income elasticities for raw material exports of LDCs are calculated for the 1953-1960 period. See also, R. Weisskoff, "Demand Elasticities for a Developing Economy: An International Comparison of Consumption Patterns," Yale University Economic Growth Center Paper No. 169, New Haven, Connecticut, 1971. For a critical appraisal of the use of income elasticities by planners, see Q. Paris, *An Appraisal of "Income" Elasticities for Total Food Consumption in Developing Countries* (Paris: Organization for Economic Cooperation and Development, 1970)

3.32/For an analysis of import substitution, see A. O. Hirschman, "The Political Economy of Import-Substituting Industrialization in Latin America," *Quarterly Journal of Economics*, 82, No. 1 (February, 1968), pp. 1-32. Paul Prebisch, one-time head of the U.N. Economic Commission of Latin America, is commonly associated with the policy, although he himself came to criticize its excesses. See his "Commercial Policy in the Underdeveloped Countries," *American Economic Review*, 49, No. 2 (May, 1959), pp. 251-273; and *Towards a Dynamic Development Policy for Latin America* (New York: United Nations, 1964). In some instances, import substitution was viewed as one way of reducing dependence of African states on former colonial economic power: N. Nkrumah, *Africa Must Unite* (New York: Praeger, 1963)

erecting high tariff walls to protect local infant industries from outside competition, and by granting an array of subsidies to selected firms, especially for the use of capital.[3.33]

The strategy initially stimulated a fair amount of light manufacturing in LDCs which was relatively labor-intensive and required no large-scale production to reach efficient unit costs. There was, however, substantial encouragement of an investment in large-scale, capital-intensive industrial activities, even in smaller LDCs with modest domestic markets.[3.34] Such production turned out to be rather import-intensive as imported machinery, equipment, spare parts, and imported raw materials were required for such industrial activities. The frequent lack of competition and the small local market size contributed to a highly inefficient industrial structure as manifested in high unit costs.[3.35]

SMREs played no significant role in the strategy, nor were they intended to. Backward linkages between large industrial firms and SMREs were not emphasized, as large industries were not oriented toward the natural resource base, skill levels, or production patterns of the other sectors of the economy. Likewise, planners viewed the SMRE as part of the backward, traditional sector which was to gradually diminish in size as the modern sector expanded, so no concrete attempts were made to subsidize them either.

SMREs were, nevertheless, affected negatively by the import substitution policies in many cases. The high level of protection of infant industrial firms, for instance, provided a monopoly power to some local industries, resulting in SMREs having to pay monopoly prices for their inputs from such industries or in having to receive monopsony determined prices for their output sold to such companies. In one country, for example, it was found that the monopoly position of the domestic flour mill resulted in flour prices for small scale bakers which were more

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3.33/The infant industry argument played an important role in justifying the high protection that resulted. See M. C. Kemp, "The Mill-Bastable Infant Industry Dogma," *Journal of Political Economy*, 60, No. 1 (February, 1960), pp. 65-67.

It might be noted also that import substitution received a good deal of "accidental" as well as conscious encouragement through the imposition of import restrictions due to balance of payments crises during the depression of the 1930s as well as afterwards, in addition to the unavailability of goods from the developed countries during the Second World War. W. Baer and I. Kerstenetzky, "Import Substitution and Industrialization in Brazil," *American Economic Review*, 54, No. 3 (May, 1964), pp. 411-425 For a review of the type of import controls used in import substitution in Brazil, India, Japan, Tunisia, Argentina, Colombia, France, Spain, and Turkey, see various authors in *Legal Controls of Imports and Industrial Licensing* (New York: Columbia University School of Law and the International Institute of Administrative Sciences, 1968).

A typical listing of fiscal incentives offered under import substitution industrial incentives laws would include: 1) total or partial exemption of national income taxes; 2) exemption from local income taxes, property taxes, taxes on working capital, and other miscellaneous national and local taxes; 3) carryforward of losses for extended periods; 4) accelerated depreciation on machinery and equipment; 5) partial or total import duty exemption on imported capital equipment, and in some cases on imported raw materials; 6) government leasing of factory shells at below-market rental rates; 7) limited wage subsidy payments, partial exemption on social security contributions by companies, and/or free government training programs. See, for example, L. E. Westphal and K. W. Kim, *Industrial Policy and Development in Korea* (Washington, D.C.: World Benk, 1977); A. O. Krueger, Foreign Trade Regimes and Economic Development: Turkey (New York: Columbia University Press, 1974); B. D. Smith, *The Impact of Trade Policy on Exports in Oil Rich Countries: The Cases of Ecuador and Trinidad & Tobago* (Washington, D.C.: Organization of American States, 1975).

Typically, industrial incentives in LDCs have been apportioned on a discriminatory basis to only those firms selected by the government rather than being allotted on an industry or sector-wide basis. In the *Agreement on the Harmonization of Fiscal Incentives to Industry* of the Caribbean Common Market (CARICOM), for example, four different categories were created for firms selected for government fiscal incentives The length of years for which the incentives were granted and the percentage of taxes exempted were then varied according to the categories. For a review of the subject, see D. Usher, "The Economics of Tax Incentives to Encourage Investment in Less Developed Countries," *Journal of Development Economics*, 4, No. 2 (June, 1977), pp. 119-148.

3.34/W. Baer and M. E. A. Hervé, "Employment and Industrialization in Developing Countries," *Quarterly Journal of Economics*, 80, No. 1 (February, 1966), pp. 88-107; K. Kojima, "Structure of Comparative Advantage in Industrial Countries: A Verification of the Factor-Proportions Theorem," *Hitotsubashi Journal of Economics*, 11, No. 1 (June, 1970), pp. 1-29.

3.35/C. F. Diaz-Alejandro, "On the Import Intensity of Import Substitution," *Kyklos*, 18, No. 3 (1965), pp. 495-511; and his "Turning from Import Substitution to Export Promotion in Colombia," Yale University Economic Growth Center, 1973; and J. Sheahan, "Import Substitution and Economic Policy: A Second Review," Williams College CDE, RM-50 (1972).

than two times the import price.[3.36] Of course, the overall inefficiency of import substitution industries also contributed to increased costs for SMREs dealing with them.

Direct and indirect subsidies had the effect of encouraging capital-intensive and import-intensive activities and techniques to the prejudice of SMRE production which tends to be more labor-intensive and intensive in the use of local resources In one study comparing the choice of technique for textile production using automatic and semi-automatic imported and domestic looms, for example, it was found that the implicit subsidy for the more capital-intensive automatic imported looms was more than two times greater than that to automatic domestic and many times greater than domestic semi-automatic looms, the most labor-intensive, for which there was a net negative subsidy element [3.37]

Import substitution policies, in conjunction with other "equity" motivated policies, also negatively impacted agriculture which in turn limited SMREs and larger agribusiness projects because of their direct links with agriculture The whole industrialization policy resulted in a disproportionate direct and indirect taxation of agriculture through such mechanisms as discriminatory subsidies, overvaluation of the exchange rate, high tariffs on imported agricultural inputs, export taxes on agricultural exports, price controls of agricultural goods to subsidize local food consumption, etc. The stagnation of agriculture reduced the demand of farmers for products of SMREs used by farmers and farm laborers as inputs or family consumption items. Likewise, agribusinesses had difficulty in many cases in expanding production because of the unavailability of a stable and expanding supply of agricultural inputs [3.38]

In determining appropriate interventions, the distortions fostered by import substitution have traditionally been taken into account in the cost/benefit analysis of projects. Shadow pricing of the costs of labor, capital, and foreign exchange involve making adjustments for subsidies, tariffs, and taxes, and wage distortions in the modern sector, to determine the true costs and benefits to a country from an activity. As the method for doing this is

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3 36/C Liedholm and E Chuta, "The Economics of Rural and Urban Small-Scale Industries in Sierra Leone," *African Rural Economy Paper No 14*, Michigan State University, East Lansing, 1976, p 117

3 37/Y W. Rhee and L E Westphal, "A Micro, Econometric Investigation of Choice of Technology," *Journal of Development Economics*, 4, No 3 (September, 1977), pp 205-237.

Fiscal incentives have generally not benefited small scale enterprises because such firms have rarely been selected for such programs In Pakistan, for example, it was found that small scale firms did not even qualify for incentives because, by not registering for the census, they were automatically excluded F C Child and H Kaneda, "Links to the Green Revolution: A Study of Small-Scale Agriculturally Related Industry in the Pakistan Punjam," *Economic Development and Cultural Change*, 23, No 2 (January, 1975), pp 249, 252 An ILO study in the Philippines also showed that industrial incentives went disproportionately to capital intensive, larger firms *Sharing in Development: A Programme of Employment, Equity and Growth for the Philippines* (Geneva: ILO, 1974), pp 616-617

Even if fiscal incentives and tax benefits had been more widely granted to small scale firms, they would not have conferred much of a real subsidy Since small scale enterprises do not generally pay income taxes and have low capital costs, income tax exemptions along with accelerated depreciation allowances and liberal provisions for the carrying forward of losses are largely meaningless to small scale firms While labor subsidies would be important, such incentives are the most rare and given for the shortest periods of time. Fiscal incentives to larger agribusiness projects have the effect of encouraging import intensive and capital intensive activities and techniques, and not infrequently subsidies have been granted to inherently more capital-intensive agribusiness activities to the prejudice of more labor-intensive ones

3 38/Calculations of nominal and effective rates of protection of agriculture relative to industry in developing countries generally show the effective protection for agriculture to be significantly below industry See B. Balassa and Associates, *The Structure of Protection in Developing Countries* (Baltimore: The John Hopkins Press, 1971) for comparisons in Brazil, Chile, Mexico, West Malaysia, Pakistan, the Philippines, and Norway A typical case of traditional agriculture being taxed to benefit the non-agricultural sectors is that of Uruguay in the early 1970s Through export taxes and a prolonged overvaluation of the exchange rate coupled with an implicit multiple exchange system, wool and beef were prejudiced in order to subsidize the local consumption of beef and the processing of these goods by modern import substituting industries See B D Smith, *Latin American Trade Patterns and Policies: The Case of Uruguay* (Washington, D C.: Organization of American States, 1974). For a more general treatment of distortions to agriculture, see G E Schuh, "Approaches to 'Basic Needs' and to 'Equity' that Distort Incentives in Agriculture," paper presented at the Workshop on Constraints on World Agricultural Production with Special Reference to Distortions of Incentives, American Academy of Arts and Sciences, University of Chicago, September, 1977.

treated in Chapter 11, its context is only noted here. A number of LDCs, however, are becoming increasingly receptive to the idea of modifying some of the mechanisms which cause these distortions, especially the exchange rate, tariffs, and subsidy policies, and it may be that some countries might be interested in an intervention which consists of making recommendations regarding more rational policies in this area.[3.39]

By the mid-1960s, criticism of the import substitution strategy was widespread as it became evident that equity considerations such as employment and income distribution were little impacted by the growth oriented industrialization approach.[3.40] Out of this criticism emerged two separate strategies—that of export promotion and that of small and medium scale enterprise development.[3.41] While the former preceded the latter, which is just coming into its own, they bear similar objectives, and in some cases are intimately related, although this relationship has not generally been given sufficient attention.

The approach of SMRE development stands in stark contrast to that of import substitution, large scale industrialization. Import substitution was capital-intensive in the face of capital scarcity and widespread unemployment, and import-intensive in the use of inputs in the face of foreign exchange scarcities.[3.42] SMREs, on the other hand, are shown to be labor-intensive and judicious in the use of capital, located in rural areas, and inseparably entwined in the agricultural sector where much of the unemployment and poverty exists and from which it draws its raw materials.[3.43] It has been suggested that SMREs are more labor intensive not only because they tend to be involved in the production of goods which are inherently labor-intensive, but also because prices they pay for labor

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3.39/This is evidenced by the number of LDCs which now have a crawling peg system for adjusting their exchange rate, have severely modified incentive systems which reduce the subsidy element to import substitution, and have begun to examine their tariffs with a view of making them more uniform and in a more manageable form

3.40/S Macario, "Protectionism and Industrialization in Latin America," *Economic Bulletin for Latin America*, 9, No. 1 (March, 1964), pp. 61-102; W. F. Steel, "Import Substitution and Excess Capacity in Ghana," *Oxford Economic Papers*, 24, No. 2 (July, 1972), pp. 212-240; and I. Little, T. Scitovsky, and M. Scott, *Industry and Trade in Some Developing Countries* (London: Oxford University Press, 1970). Baer and Hervé, *op. cit.*, showed that for a number of countries which increased substantially their industrial output, labor absorption was minimal because of its capital intensive nature See also, Y. Ho, 'Development with Surplus Population—The Case of Taiwan: A Critique of the Classical Two-Sector Model, a la Lewis," *Economic Development and Cultural Change*, 20, No 2 (January, 1972), pp. 210-234.

3.41/ Export promotion as a growth and employment oriented strategy gained increasing acceptance as a number of Far East countries achieved rapid growth rates under the strategy. See, for example, L Westphal, "The Republic of Korea's Experience with Export-Led Industrial Development," *World Development*, 6, No. 3 (March, 1978), pp. 347-382. See also, R. A. Berry, "Unemployment as a Social Problem in Urban Colombia: Some Preliminary Hypotheses and Conclusions," Yale University Economic Growth Center Paper No 144, 1972.

For the sake of brevity, the text omits one strategy which was employed before export promotion in order to prop up the faltering import substitution strategy—which was that of forming regional customs unions. The intent was to create regional markets in which LDC import substitution industries would have a large enough protected market so that they could produce at efficient levels. Regional trade liberalization schemes were created in South America, Central America, the Caribbean, and in Africa The results to date, however, have not been encouraging, although for some LDCs they continue to have an important influence. One of the problems was that all the member countries of the customs unions tended to have similar industries, and the smaller countries feared they could not compete with the larger ones, so the process often stopped before it reached a level where there could have developed an inter-country specialization based on comparative advantage. Likewise, the lack of roads and shipping routes between member countries tended to make transportation costs high and shipments difficult among the member countries. For some of the problems in the Latin American case, see M S. Wionczek, *Latin American Economic Integration; Experiences and Perspectives* (New York: Praeger, 1966). For a rationale of customs unions for LDCs, see C A. Cooper and B. F. Massell, "Toward a General Theory of Customs Unions for Developing Countries," *Journal of Political Economy*, 73, No. 5 (October, 1965), pp. 461-476

It might also be noted that if the excesses of import substitution have been discredited in theory, they tend to often live on in practice. It is not easy to rapidly change policies after entrenched interest groups have been created. See B. Balassa, "Reforming the System of Incentives in Developing Countries," *World Development*, 3, No 6 (June, 1975), pp. 365-382 A. O. Krueger in "Some Economic Costs of Exchange Control: The Turkish Case," *Journal of Political Economy*, 74, No. 5 (October, 1966), pp 466-480, applied the now well known domestic resource cost of foreign exchange calculation to a number of import substituting and exporting industries of Turkey and found the former more highly subsidized than the latter.

3.42/This was one of the ironies, as import substitution had been partially justified as correcting past structural problems which had been blamed for prior balance of payments disequilibrium

3.43/The characteristics of SMREs are well documented elsewhere in this document.

and capital are not distorted by subsidized capital and high wage rates set by labor union negotiations.[3.44] Likewise, by providing increased employment and income benefits in rural areas, migration to the cities can be positively impacted and employment and income distribution goals can be achieved as SMREs concentrate directly on those groups in greatest need.

A strategy of expanding SMRE participation in the economy depends in part on increasing the demand for the goods and services these firms produce.[3.45] An increase in demand for SMRE activities will, in turn, depend upon at least one of the following: 1) increasing incomes of rural families so that SMRE goods and services are demanded more in the form of farm inputs (e.g., farm implements) or farm and nonfarm family consumption items (e.g., clothing); 2) by forming forward linkages with larger firms generally located in the cities (e.g., jute sacks to a fertilizer plant in larger market centers); or 3) by selling the increased output of SMREs in new regional markets or exporting it to other countries.

This last area is the point where the current export-oriented strategy and SMRE strategy importantly link. For many SMRE products the local market does not offer any significant opportunities to SMREs if they want to expand their production or to new SMRE firms wishing to start up. To some of these firms, exporting will offer the only viable way for some SMRE activities to grow. As the relative importance and potential benefit of the export market will vary according to the type of product, size of the country, and the level of development of SMREs and the country, interventions must be tailor-made to the unique characteristics of the SMREs and country being assisted.

Export promotion activities are important as part of an overall economic development effort, especially for the smaller and/or agriculturally based LDCs. There are many raw and processed agricultural goods for which the LDCs have a comparative advantage because of their labor-intensive requirements, and for which the income elasticities of demand are high, especially in the developed countries (e.g., vegetables, certain fruits, and oilseed plants) which can be successfully exported in competition with developed countries. Agribusiness, for example, is often emphasized as a way of increasing the local value added in the raw agricultural producing LDCs.[3.46] Although these increased benefits can accrue to an LDC, a substantial portion of the processed agricultural goods must be exported in order to reach economic levels of production or in order to process enough agricultural output to favorably impact the agricultural sector.[3.47] If exporting can be achieved, benefits are received by the country in the form of lower prices for processed goods, the generation of additional foreign exchange, as well as increased employment in the agribusiness and agricultural sectors. These processing enterprises not only tend to be labor-intensive (a large percentage of this labor force being women) in and of themselves, but also provide increased demand for products that can be linked to small producers and/or labor-intensive agriculture. In addition, they spawn a host of

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3.44/That is to say, because their factor costs approximate their shadow prices, their factor mix tends to reflect the relative abundance of labor to capital in LDCs See S Guisinger, *Wages, Capital Rental Values and Relative Factor Prices in Pakistan* (Washington, D C.: World Bank, 1978), pp. 29-31.

3.45/This has been pointed out in several studies dealing with small scale enterprises. See, for example, World Bank, *Employment and Development of Small Enterprises*, p. 31; Esman, *The Landless and Near Landless in Developing Countries*, pp. 101-102. The argument of insufficient growth of local demand to sustain the growth of small scale enterprises generally is disputed by some authors. Since this issue is treated more fully elsewhere, it is only mentioned here.

3.46/See, for example, F Meissner, "Formulating Effective Assistance Programs for Food System Development," *Building Viable Food Chains in the Developing Countries*, Food & Feed Grain Institute Special Report No. 1, August, 1973, Kansas State University, Manhattan, Kansas

3.47/For a treatment of a number of problems of marketing agribusiness products in the U.S. market, see R. A. Goldberg et al, *Agribusiness Management for Developing Countries—Latin America* (Cambridge, Massachusetts: Ballinger Publishing Co., 1974).

labor-intensive satellite industries which provide the processing plants with such things as wooden crates, jute sacks, etc.

While the export-oriented growth strategy was also a reaction to the excesses of import substitution, there have been few attempts to link it with SMREs. As with the SMRE strategy, export promotion is based on the recognition that the comparative advantage of LDCs lies in labor-intensive rather than capital-intensive activities. It is likewise based on the idea that through international specialization in exportable labor-intensive production, both growth and employment objectives can be achieved.[3.48]

The lack of focus on SMREs as a source of exporting of labor-intensive goods for which they are producers, however, can be traced in part to the practical requirements of operating in the international market. For a variety of reasons, LDCs have traditionally traded little among themselves, and the labor cost advantage exists primarily for goods to the developed countries, so those countries are the target of LDC export efforts. To market goods in developed countries, however, requires that an exporter in an LDC has the capacity to fill (what are to him) large orders in short periods of time, provide products of a uniform and high quality, and ensure that the products are tailored to the tastes of consumers in the developed country ordering the goods. Likewise, the exporter's ability to market products will depend upon cultivating and maintaining contacts with importers in developed countries, providing reliable and prompt service, and keeping abreast of style changes and other market information—all of which are a fixed cost to him, regardless of the volume he exports. Thus, he will be more interested in dealing with larger companies which can supply him with large orders and with whom he can make arrangements regarding quality control in production and adaptation to foreign tastes.[3.49]

3.48/W. G. Tyler in "Manufactured Exports and Employment Creation in Developing Countries: Some Empirical Evidence," *Economic Development and Cultural Change*, 24, No 2 (January, 1976), pp 355-373, has argued that exporting of manufactured goods by LDCs will not be labor or foreign exchange generating Balassa has concluded that export-led growth in a number of countries has raised growth rates significantly, as well as improved efficiency and employment opportunities. See his "Export Incentives and Export Performance in Developing Countries: A Comparative Analysis," *Weltwirtschaftliches Archiv*, 114, Heft 1 (1978), pp 24-61. Recent evidence tends to confirm the view that trade between LDCs and developed countries is determined by factor cost differences, so that LDCs have a clear advantage in labor-intensive exports in their trade with the industrialized countries, which affects the demand for labor in their countries. See A O Krueger, "Alternative Trade Strategies and Employment in LDCs," *American Economic Review*, 68, No. 2 (May, 1978), pp. 270-274; B Balassa, *A "Stages" Approach to Comparative Advantage* (Washington, D.C : World Bank, 1977)

Theories regarding trade between developed countries help to also explain some of the trade and production patterns in the LDCs. The evidence tends to increasingly support the proposition that trade between developed countries is greatly influenced by technology, rather than differences in labor or physical capital costs G. C. Hufauer, "The Impact of National Characteristics and Technology on the Commodity Composition of Trade in Manufactured Goods" (ed. R. Vernon), *The Technology Factor in International Trade* (New York: Columbia University Press, 1970); and G. Goodman and R. Ceyhun, "U S. Export Performance in Manufacturing Industries: An Empirical Investigation," *Weltwirtschaftliches Archiv*, 112, Heft 3 (1976), pp. 525-555. The pattern supports the theory of R. Vernon and others which explains trade patterns on the basis of the product cycle. Vernon, for example, has explained shifts in production patterns of exportables between developing and developed countries, where the development of a new product starts out in a developed country through the application of skill-intensive processes as scientists and engineers develop a product. Then the process becomes more intensive in physical capital as modifications tend to settle down and production becomes more standardized. Finally, as the process becomes more routinized, machinery and unskilled labor replace functions previously done by skilled labor and the process becomes more viable in an LDC. See R. Vernon, "International Investment and International Trade in the Product Cycle," *Quarterly Journal of Economics*, 80, No 2 (May, 1966), pp 190-207; and R R. Nelson and V. D. Norman, "Technological Change and Factor Mix Over the Product Cycle: A Model of Dynamic Comparative Advantage," *Journal of Development Economics*, 4 No. 1 (March, 1977), pp. 3-24. For a recent article analyzing industrial exports, see M. I. Blejer, "Income Per Capita and the Structure of Industrial Exports: An Empirical Study," *Review of Economics and Statistics*, 60, No 4 (November, 1978), pp. 555-561.

3.49/For a description of the problems faced and programs initiated in Israel's highly successful export promotion efforts, see Y. Shehory, "Export Promotion Policies—The Role of Government: The Israeli Case," paper presented at the Seminar on Agricultural Policy: A Limiting Factor in the Development Process, Inter-American Development Bank, Washington, D.C., March, 1975.

The entry problems for SMREs are obvious. Quality differences and low quality production are common characteristics of SMREs. A SMRE will not have access to information regarding adaptation requirements of the foreign market, nor can it afford the high fixed costs of entering the foreign market alone, and an exporter will have little interest in dealing with a sole SMRE.

These problems are surmountable, however, through appropriately designed interventions. Ho and Huddle have shown that there does exist the demand in developed countries for a large number of labor-intensive articles produced by SMREs and that the growth in demand for these goods in developed countries is strong.[3.50] Since SMREs will not know, however, whether or not their products are the ones for which external demand exists, an appropriate intervention is that of conducting market studies in conjunction with SMREs to determine their export potential. To overcome the lack of information, interventions can focus on providing services which keep SMREs informed as to market requirements for their goods, analyze their production methods to assist in needed adaptations to foreign market tastes, provide export training, etc. Equally important are interventions aimed at institution building and training in two areas. First, a frequently needed intervention will be that of building SMRE groups which permit the coordination of their production, quality levels, and adaptations to the demands of the international market. Secondly, institution building through training will often be needed to develop export firms which can interact with these groups of SMREs to funnel their production into the international market, as well as keep them abreast of needed market requirements, obtain export financing, and deal with the other special exporting requirements of SMREs.[3.51]

This type of intervention has been done in the past through financial support of A.I.D., although it has not been directed toward the special problems and requirements of SMREs. Such interventions, however, will be a sine qua non for the expansion of some SMRE activities

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3.50/ Y. Ho and D. L. Huddle, "The Contribution of Traditional and Small Scale Culture Goods in International Trade and in Employment," Rice University Program of Development Studies Paper No 35, Fall, 1972, Houston, Texas. The study focused on 81 handicraft products which are small scale producing culturally distinct, rather than standardized products. They found:

> " ... Contrary to the expectation that these products have performed poorly, as a group they have performed as well as, and in many cases better than, all internationally traded goods in a period of rapidly expanding trade, particularly as between the advanced countries. Nonetheless, between 1964 and 1970, both broad groups have had an income elasticity of demand of about about (sic) 1.3 cross section in O.E.C.D. countries for the year 1968-1969 pooled and 1.7 in the U.S."

The authors explained the high elasticities as being in part a manifestation that as incomes rise in developed countries people's tastes become more distinct so they turn more from standardized products to those of artistic and distinctive cultural character.

3.51/ As export promotion has become more accepted and implemented in the LDCs, the developed countries have become less enthusiastic about free trade. The world recession of the early 1970s and slow recovery in the subsequent period, with levels of unemployment which are high for the developed countries, have contributed significantly to increased protectionism in the developed countries, especially with regard to labor intensive goods from the LDCs. See, for example, R. Blackhurst, N. Marian, and J. Rumlir, "Trade Liberalization, Protectionism and Interdependence," *GATT Studies in International Trade No. 5*, Geneva, November, 1977; B. Balassa and M. Sharpston, "Export Subsidies by Developing Countries: Issues of Policy," *Commercial Policy Issues*, No. 3 (November, 1977), pp. 13-50. Interestingly, although export subsidies have the same effect as import protection of favoring domestic over foreign production, the developed countries have taken an increasingly tougher stand on export subsidies from developing countries through the application of countervailing duties. See T. Murray and B. Smith, *GATT Rules and United States Law Regarding Export Subsidies and Countervailing Duties* (Washington, D.C.: Organization of American States, Special Commission on Consultation and Negotiation, 1977).

CHAPTER FOUR: ALTERNATIVE PROJECT INTERVENTIONS: DESIGNING TO BENEFIT THE POOR

A The Rural Economy: System Interventions and Linkages

The rural economy in the LDCs is an interknit system. Farms, small scale enterprises, commerce, and services operate in an integrated fashion whether or not a money economy predominates. Growth and development in this system also take place in an interknit fashion. Interknit does not necessarily imply that balanced growth may stem from an initiative in a single segment of the system and spread unevenly to other components of the rural economy.[4.1] The benefits of growth may pass outside this economy to urban consumers or to the urban and rural nonpoor.

Agroindustry, agribusiness and agroservice enterprise interventions are located in the middle of this backward-to-agriculture and forward-to-final-consumer system of linkages.[4.2] These interventions are ideally situated to draw the system more closely together, to pass more evenly the growth potentials of one segment of the rural economy to the others connecting potential producers with final markets.[4.3]

If the interventions are carefully designed for the poor, they can reduce benefit leakage outside the rural economy and to the nonpoor, but this is not automatic. Capital-intensive agroindustry drawing its raw material from large farm capital-intensive rural production may even tend to isolate and displace benefits to the poor by closing them out of the system rather than drawing them in. While the potential of increasing the welfare of the poor is great through interventions in these pivotal linking agroindustrial and rural enterprise activities, the design must be clearly focused on drawing the poor, their labor resources, their limited skills and existing entrepreneurial experience into the system.

The issue addressed in this chapter is: How can the agroindustrial and rural enterprise interventions be designed so as to maximize benefits for the poor?

The basic recommendations apply to all types of interventions and constitute an analytical checklist against which to test each intervention and its components. The three recommendations all have a common focus of

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4.1/ An extended treatment of the dynamics of "unbalanced" growth may be found in A O Hirschman, *The Strategy of Economic Development* (New Haven: University Press, 1958).

4 2/ While most of the agroindustrial and rural enterprise interventions involve the elaborating and/or marketing of some farm product where the "linkage" role between producer and consumer is obvious, other agroindustries, such as those which produce farm inputs perform a similar function.

An interesting example of this backward linkage is that of the growth of small firms producing mainly pumps and strainers. These products allowed farmers to substantially increase the availability of water which was required by new wheat and rice varieties developed as part of the "green revolution" in the Punjab of Pakistan. See F. C. Child and H. Kaneda, "Links to the Green Revolution: A Study of Small-Scale, Agriculturally Related Industry in the Pakistan Punjab," *Economic Development and Cultural Change*, 23, No. 2 (January, 1975), pp. 249-275.

It is asserted that, at least in the case of mainland China, small scale industry was more sensitive to the technical needs of rural areas than larger urban plants. T. G. Rawski, *Industrialization, Technology and Employment in the People's Republic of China* (Washington, D.C.: World Bank, 1978).

4.3/ It is increasingly argued in the literature that small scale nonfarm rural enterprises can provide a key role in passing the benefits of growth to the underemployed See W. F. Steel and Y. Takagi, *The Intermediate Sector, Unemployment and the Employment-Output Conflict: A Multi-Sector Model* (Washington, D.C.: World Bank, 1978).

building on existing enterprise structures and of maximizing the involvement of the poor through the utilization of their skills, resources, and products.

1. All interventions should be so designed as to focus first on the use of the most important single resource owned by the rural farm and nonfarm poor—their labor.

2. All interventions should be so designed as to focus on the second most important resource of the nonfarm rural poor—their small scale enterprises and the entrepreneurial skills they have developed to operate them.

3. All agroindustrial interventions (those using farm products as their inputs) should be so designed as to draw their raw material from the second most important resource of the rural farm poor—their small farms and the entrepreneurial skills they have developed to operate them.[4.4]

As we shall observe in the discussion which follows, none of these suggestions will occur automatically simply because the intervention is an agribusiness or rural enterprise intervention; they must be conscious design choices carefully studied and integrated into each project. The nonpoor are comparatively agile in most rural and urban situations. It is they, the nonpoor, who can usually take advantage of new resources, new government programs and incentives, new market opportunities, etc. The nonpoor are the ones who by and large have the skills and mobility to shift, to adjust, and to capture the benefit of most realignments in the rural economy. Perhaps the best way to at least reduce the natural advantage of the nonpoor is to directly utilize the poor and their resources in the intervention itself.

B. Focusing Interventions on Employment Creation

There are two basic ways to insure that agribusiness and rural enterprise project interventions maximize their impact on employment creation. First, focus the intervention on products with a high labor intensity, that is, those which require large proportional quantities of labor relative to capital and land.[4.5] Second, to utilize technologies and techniques in project interventions which are the most efficient using "shadow prices" for labor.[4.6] In simpler terms, the first is to favor the production of goods which use large proportions of labor, and secondly to use techniques for the production of all goods which utilize higher proportions of labor.

For example, labor represents a higher proportion of total costs in the processing of fruits and vegetables at almost all levels of technology than wheat milling. Fruit and vegetable products may be thought of as "labor inten-

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4.4/ Ironically, Hirschman has argued that because extrepreneurial skills are a scarce resource in LDCs, capital intensive operations might be the most appropriate process in some instances as a savings of limited managerial resources. A. O. Hirschman, *The Strategy of Economic Development* (New Haven: Yale University Press, 1958), see Chapter 8. The thesis has been tested by various authors with inconclusive results by examining to see if labor productivity differentials between developing and developed countries are much larger in labor-intensive than in capital-intensive industries. See, for example: J. Gouverneur, "Hirschman on Labour Productivity Differentials: An Empirical Analysis," *The Bulletin of the Oxford University Institute of Economics and Statistics*, 32, No. 3 (August, 1970), pp. 259-265; C. F. Diaz Alejandro, "Industrialisation and Labour Productivity," *Review of Economics and Statistics*, 47, No 2 (May, 1965), pp. 207-214; and J. M Healy, "Industrialisation, Capital Intensity and Efficiency," *Bulletin of the Oxford University Institute of Economics and Statistics*, 30, No. 4 (November, 1968), pp. 323-339.

4.5/ It is frequently debated to what degree there is factor substitution as the relative costs of labor and capital shift. Hal B. Lary in *Imports of Manufacturers from Less Developed Countries* (New York: Columbia University Press, 1968) found little factor intensity reversals for a number of U.S. imports. One review of empirical studies on employment and industrialization concluded that " .. despite the fact that there is scope for factor substitution in most activities, it seems clear that some goods can be regarded as unambiguously more labor-intensive in production than others." D. Morawetz, "Employment Implications of Industrialisation in Developing Countries: A Survey," *The Economic Journal*, 84, No 335 (September, 1974), pp 491, 503. This would suggest that the inherently labor-intensive activities be identified early in the project planning process to enable them to be selected for appropriate interventions.

4.6/ The issue of "appropriate technology" has generated an immense amount of literature in recent years. For empirical studies on the relationship between appropriate technology, shadow prices for labor, and profitability, see D. Morawetz et al., *Studies of Inappropriate Technologies for Development* (Cambridge, Mass: Harvard University, Center for International Affairs, monograph, 1974); see also, Chapter 5.

sive" products compared to "wheat flour." These labor-intensive products should be favored in interventions. It is possible to process either fruits and vegetables or flour with different techniques, each having a different labor intensity. Regardless of the product involved, interventions should favor those techniques or technologies which are more labor using or labor intensive.[4.7] These two project choices, choice of product and choice of technique, should both be used to focus on maximizing employment creation. A brief discussion of the two is given below.

1. Favoring Labor-Intensive Products

Most of the discussion in the literature of labor intensity and appropriate technology has focused on differences in the labor intensity of different techniques of production or what has been roughly termed "labor intensive technologies." Aside from the important issue of "how" to produce using more or less labor (which is dealt with in the next subsection), there is the issue of what to produce, or more specifically, what products should be included or expanded in an agribusiness or rural enterprise project intervention. This subsection argues that this product choice will have as much if not more impact on employment generation as will the choice of technology or how to produce.[4.8] Table 4-1 presents a measure of the labor intensity of different agribusiness products for El Salvador. From the table it can be seen that the two examples used above, cereals milling and fruit and vegetable processing, are very different in their employment intensity (in this table employment intensity is measured as the number of workers per $ output). Four and one half times as many workers are utilized to produce one dollar of output in fruit and vegetable processing as are used in cereals milling at the current El Salvadoran technology level. From Table 4-1 it can be seen that choosing the products for which the A.I.D. project will intervene will have a fundamental influence on the employment impact of the A.I.D. project funds. On this scale of product labor intensity, the magnitude of the range is substantial. Low labor intensity products create in many cases less than one-tenth as much employment per unit output as do the very high ones. Product choice is a project design issue of critical importance for maximizing employment impacts.

The labor intensity of products should be examined in a systems context which includes the labor intensity of both backward and forward linkage; that is, product labor intensity should take account of the labor intensity of the primary agricultural product (backward linkage) and the labor intensity of later processing stages (forward linkage). Instead of intervening in a single product, any project will really be impacting on a product chain that stretches from primary farm production through marketing and processing to final consumption.[4.9]

Table 4-1 also provides an illustration of this idea. While cereals milling is one of the least labor using of agribusiness activities, baking is among the very highest. If a project were to select cereals milling as a sector for

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4.7/ In favoring labor-intensive techniques, social efficiency criteria should be used to evaluate technological alternatives to insure that socially inefficient techniques are not utilized in the name of "appropriate" or "labor-intensive" technology. By shadow pricing labor at its opportunity cost, most of the possible distortion can be removed from economic efficiency criteria.

4.8/ For a discussion of product mix for employment generation, see F. Stewart and P. Streeten, "Conflicts Between Output and Employment Objectives in Developing Countries," *Oxford Economic Papers*, 23, No. 2 (July, 1971), pp. 145, 166.

4.9/ Input-output techniques are those conventionally employed to measure indirect employment impacts. Since their cost of construction and calculation can be high, input-output models tend to be made by larger development institutions. For examples of some past efforts, see International Labor Office, *Sharing in Development: A Programme of Employment, Equity and Growth for the Philippines* (Geneva: ILO, 1974), pp. 659-677; S. Anand, "Input-Output Analysis Applied to Employment: A Case Study of Yugoslavia," Mimeo, IBRD, DED (1972); B. Hazari and J. Krishnamurty, "Employment Implications of India's Industrialization: Analysis in an Input-Output Framework," *Review of Economics and Statistics*, 52, No. 2 (May, 1970), pp. 181-186; S. Daines et al., *Input-Output Matrices Condensed for Employment and Income Distribution Analysis—76 Sectors*, Statistical Working Document No. 4 (Washington, D.C.: Agency for International Development, 1972).

Table 4-1
Labor Intensity of Agribusiness Production in El Salvador
Index of the Number of Workers per $1,000 of Output
(National Average Intensity = 100)

Very High Labor Intensity	
Sugar/Panela	712
Wood Products	317
Clothing	276
Furniture	242
Baking	204
High Labor Intensity	
Fruit and Vegetables	170
Shoes	143
Candy Products	130
Median Labor Intensity	
Textiles	93
Fishing	78
Tobacco	68
Meat Products	66
Coffee	65
Fish Products	62
Milk	59
Low Labor Intensity	
Edible Oils	39
Cereals Milling	38
Drinks	22

Source: Industrial Census, El Salvador, 1971.

intervention, the poor labor performance of milling should be adjusted by the high labor performance of the baking industry which would be inevitably affected. But what of the backward link? From the employment point of view, cereals compared to fruits and vegetables generally use considerably less labor. The labor intensity of these different products is not difficult to estimate, and product choice can be harnessed as an important project alternative for increasing the employment impact of agribusiness and rural enterprise interventions.

2. *Technological Choice and Labor Intensity*

The same type of product can usually be produced in different ways, each having a different labor intensity. This manual is not the place for a long and/or highly technical discussion of the optimal method for determining what the most appropriate technology is in any specific case (see Chapter 5). Where labor is substantially underutilized its market wage seldom reflects its true economic worth. In this situation it is usually more efficient to use more labor in production than would be indicated by the relative prices of capital and labor.[4.10] Agribusiness and rural enterprise projects should be very much aware of the need to avoid allowing distorted prices (import subsidies on capital, etc.) to encourage the use of capital at the expense of labor. The question addressed by this subsection is, how can agribusiness project design appropriately favor labor-intensive techniques?

4.10/ For evidence suggesting that developing countries generally employ technological processes which are too capital-intensive given their factor endowments and market size, see R. H. Mason and I. Sakong, "Level of Economic Development

a Scale of Operation and Labor Intensity of Technology

The first practical suggestion is that project design may favor labor-intensive technology by choosing to intervene and support smaller scale enterprises. Though the precise structure needs to be analyzed for each country, most agribusiness and rural enterprise subsectors reveal an increasing labor intensity (for the same product type) as scale decreases, as smaller scale enterprises tend to be more intensive. Table 4-2 shows this tendency for India.

Table 4-2
India: Labor Intensity by Scale of Operation for Selected Industry Groups, 1965
(Number of employees per $1,000 rupees of value added)

Industry Group	Scale of Operation		
	Small	Medium	Large
Grain Mill Products	.41	.22	.13
Miscellaneous Food Preparations	.45	.24	.11
Tobacco Manufacturers	.73	.69	.06
Spinning, Weaving, and Finishing of Textiles	.41	.39	.29
Textiles, n.e.c.	.93	.35	.21
Sawmills and Wood Products (Except Paper and Furniture)	.55	.30	.87
Printing, Publishing, and Allied Industries	.36	.29	.21
Basic Industrial Chemicals, Including Fertilizer	.21	.13	.10
Paints, Varnishes and Lacquers, and Miscellaneous Chemical Products	.30	.12	.07
Nonmetallic Minerals Products, n.e.c.	.49	.23	.11
Iron and Steel Basic Industries	.39	.33	.15
Metal Products, Except Machinery and Transport Equipment	.34	.21	.12
Machinery, Except Electrical Machinery	.36	.21	.18
Electrical Machinery Apparatus, Appliances, and Supplies	.34	.18	.15
Repair Motor Vehicles	.41	.37	.42
Fur Products, Except Wearing Apparel and Manufacturing Products, n.e.c.	.40	.25	.12

n.e.c.: Not elsewhere classified.
Source: Government of India, Annual Survey of Industries, 1965.

As we can see from the table, as a general rule firm size and labor intensity seem to be inversely related, although there are always exceptions. Importantly, we see that firms of similar sizes can themselves have substantial differences in labor intensity, and the degree to which they become less so as firm size increases can also vary according to the type of activity. This individuality of characteristics underscores the importance of actual analysis based on the country in which the project is to be undertaken.

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and Capital-Labor Ratios in Manufacturing," *Review of Economics and Statistics*, 53, No. 2 (May, 1971), pp. 176-178.

It might be noted that it has been suggested that a choice of technique might not exist to any significant degree. Regarding this question, see S. Amin, "Levels of Remuneration, Factor Proportions and Income Differentials with Special Reference to Developing Countries," ed. A. Smith, *Wage Policy Issues in Economic Development* (London: Macmillan & Co., 1969). Morawetz, *op. cit.*, p. 518, suggests the empirical evidence tends to support the position that substitution may not be as important as once thought.

An important issue often raised when labor-intensive technology is addressed deals with the efficiency of using labor-intensive technologies. The concern is often that in the enthusiasm for generating employment, efficiency and profitability not be forgotten. There are valid arguments which could be made supporting the notion that in labor surplus economies even some technologies which do not have high private profitability should be supported because they have justifiably high "social profitability" when the true relative economic value of resources is used to adjust factor prices.[4.11] While this argument may be important, it is probably true in many if not most actual agribusiness and rural enterprise projects that such an argument is not even necessary to support the viability of labor-intensive technologies simply because the private profitability of the more labor-intensive technologies is acceptably high. Table 4-3 illustrates this point for El Salvador by indicating that private profit margins are actually higher for the smaller scale, labor-intensive technologies. The table should not be read as indicating that this is true for all agribusiness products or all countries, but only that the reverse presumption (that labor-intensive technologies have lower private profitability) is not generally true.

Table 4-3
Profit Margin by Scale of Enterprise for Agribusiness in El Salvador, 1971

Subsector	Net Income as a % of Total Value of Production by Number of Workers per Plant				
	5 to 9	10 to 19	20 to 49	50 to 99	100+
Food Products	26%	22%	21%	25%	20%
Coffee	44	26	18	22	15
Drinks	45	39	23	38	20
Textiles	25	22	27	14	36
Clothing	28	24	20	21	25
Shoes	29	28	20	0	34
Wood Products	33	21	9	48	0
Furniture	29	18	18	27	10
All Industry	30	26	22	24	28

The implication of the foregoing discussion is that one practical project alternative for favoring labor intensive technology, and therefore increased employment, is to select smaller scale enterprises for intervention support. There is little evidence suggesting that this choice will reduce the efficiency or profitability of project investments.[4.12]

4.11/ A study of the use of different technologies involving differences in labor use regarding fabric production with automatic and semi-automatic looms, for example, showed substantial variation of social and private benefit-cost ratios in some of the processes and in the comparison of different techniques. Y. W. Rhee and L. E. Westphal, "A Micro, Econometric Investigation of Choice of Technology," *Journal of Development Economics*, 4, No. 3 (September, 1977), pp. 205-237.

4.12/ It has often been suggested that the return to capital is lower for small scale firms than larger ones. See, for example, P. N. Dhar and H. F. Lydall, *The Role of Small Enterprises in Indian Economic Growth* (New York: Asia Publishing House, 1961). In addition to the evidence in the text, there are a number of studies which tend to suggest the opposite, directly or indirectly. Taking 1970 census data for Brazil, we come out with similar findings. Child and Kaneda, *op. cit.*, p. 259, found small scale engineering firms to be more profitable than larger ones, despite government subsidies of the latter. Likewise, the social benefit-cost ratios mentioned in Rhee and Westphal, *ibid.*, were highest for the group with the smallest average firm size. Other studies have found small scale firms to have rather high rates of return to capital for a number of activities—see, for example, C. Liedholm and E. Chuta, *The Economics of Rural and Urban Small-Scale Industries in Sierra Leone*, African Rural Economy Paper No. 14, Michigan State University, 1976, pp. 91-99; International Labour Office, *Sharing in Development—A Programme of Employment, Equity and Growth for the Philippines* (Geneva: ILO, 1974), pp. 546-547.

b. *Direct Intervention in the Labor Intensity of Technology*

A second method for favoring labor-intensive technology is to identify viable labor-intensive technologies and support them directly. This alternative could be accomplished in a number of different ways.

i. *Technical Assistance*

A project could take existing labor-intensive technologies and, using industrial extension methods, encourage and train enterprises to adopt them.

ii. *Research*

Where acceptably efficient labor-intensive "packages" do not already exist, research activities could be undertaken to identify and test viable alternatives.

iii. *Direct Investment in Labor-Intensive Technologies*

In combination with technical assistance, or without it, projects could provide financial support for the installation and/or operation of labor-intensive technologies. The support could be either in money or in kind in the form of actual machinery or labor-intensive input packages.[4.13]

C. *Focusing Project Interventions on the Enterprises Owned and Operated by the Rural Poor*

The objective of focusing on enterprises owned and operated by the rural poor is to harness the entrepreneurial capabilities of the poor in the solution of their own problems, and secondly to reduce the proportion of project benefits which are captured by the nonpoor. Since the rural poor generally own and/or operate small scale enterprises, this focus also tends to concentrate project intervention on small scale and rurally located enterprises. A second reason for emphasizing those enterprises owned and operated by the rural poor is that entrepreneurial returns and profits from these enterprises are captured by the poor in addition to labor incomes. To the extent that larger scale enterprises, not owned by the poor, are the focus of project interventions, the poor will benefit only in labor incomes and not in entrepreneurial returns or profits.

The first part of this section attempts to outline the implications of focusing project interventions on smaller scale enterprises owned by the poor, or on larger scale enterprises which may benefit the poor through

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4.13/ The *Rural Development Network Bulletin* No. 7 (September, 1977) of the American Council on Education lists 165 institutions located around the world which are involved in technical assistance to small scale industries and/or carry out research in appropriate technology.

The application of labor-intensive techniques can involve a number of variations, such as the use of machinery and techniques no longer in use in the developed countries, the adaptation of machinery currently in use, and the development of new machinery, in addition to the more direct approach of merely replacing a process carried out by machinery with labor. The use of the first approach has been criticized as offering limited potential; see A. U. Khan, "Appropriate Technologies: Do We Transfer, Adapt, or Develop?," (ed. E. O. Edwards), *Employment in Developing Nations* (New York: Columbia University Press, 1974), pp. 223-233. For examples of its application, however, see G. Ranis, "Technology, Employment and Growth: The Japanese Experience," *Automation in Developing Countries* (Geneva: International Labour Office, 1972), and Child and Kaneda, *op. cit.*

employment and backward links to small farm poor families. The balance of the section examines alternative project interventions for small scale rural enterprises which are likely to be owned by rural poor families.

1. Project Focus: Scale of Operation

The major benefit of focusing on small scale enterprises is that the poor capture both the labor and profit incomes. If larger scale enterprises are the focus, the poor obtain only labor income and backward linkage incomes from increased demand for small farm production. The project choice should therefore depend on the relative size and probability of these two potential income streams. If more total income can come to the poor from added employment in larger scale firms and from the increased demand which is generated for small farm output than can be obtained in the form of labor and profits in small scale enterprises, then the choice should be in favor of the larger scale intervention. If, on the other hand, the labor income, profits, and backward links generated by small scale businesses are greater, the choice should be in favor of the smaller scale enterprises.

The backward linkage of agribusiness and rural enterprise interventions is discussed in the next section; the balance of this section attempts to deal with the issue of direct income and employment potentials of small scale enterprise interventions.

a. Employment vs. Employment Plus Profit Incomes

It is possible that the efficiency of larger scale enterprises is such that the rural poor are better off to work in the more efficient larger enterprises than to own and operate their own less efficient ones.[4.14] This does not appear to be widely supported by the available evidence and should be examined as an important project issue in each case. The reasons why the opposite appears to be the case are given below.

i. Wage Rates are Relatively Inflexible

Even if larger scale enterprises are more efficient, it is not likely that the added income would be passed along to unskilled workers in the form of increased wage rates as long as there is a large pool of unemployed from which almost endless additions could be drawn at the minimum wage. Expanding the larger scale operation would result principally in expanded employment quantity (a critically important contribution), but not in the form of increased wages.[4.15]

4.14/ A traditional position, and one which has come under increasing criticism, has been that developing countries should develop capital-intensive large scale industry. This is somewhat of a subset of the broader arguments over the alleged conflict between current output and employment and future output and employment over time. Regarding this issue, see A. Sen, *Employment, Technology and Development* (Oxford: Clarendon Press, 1975), p. 45; and F. Stewart and P. Streeten, *op. cit.* Since a number of countries which undertook heavy large scale and capital-intensive industrialization had little success in absorbing surplus labor, the strategy has come under increasing criticism. See R. L. Meyer and D. W. Larson, "Rural Nonfarm Employment: The Recent East Asian Experience," *Journal of Economic Development*, 3, No. 1 (July, 1978).

4.15/ There are several related arguments that can be made here. First is the possibility that because of the power of unions in large scale industries in developing countries, the market price of labor for large firms is so above its social cost that there results a substitution of capital for labor as the enterprise expands, decreasing marginal labor usage. For this point, see World Bank, *Employment and Development of Small Enterprises* (Washington, D.C.: World Bank, 1978), p. 69. Related to this is the issue of how broadly the direct wage benefits are spread in the large scale enterprise relative to small industries, given the higher unit labor costs in the former.

ii Owner/Operator Income vs. Wage Incomes

Focusing on small scale enterprises has the advantage that all of the income, wages and profits go to the target group. The objective of this subsection is to suggest how to measure that advantage and to suggest that in at least two countries this advantage is important; i.e., that the income of small scale owner/operators is sometimes greater than workers in large-scale enterprises.

The first example is drawn from El Salvador and is presented in Table 4-4. To properly interpret the table it is important to know that the productivity of labor (gross value of output per worker) is five times as high in large scale agribusinesses ($6,176) as in small scale enterprises ($1,144). For the food processing sector the per capita income from labor and profits in small scale enterprises is 56% higher than the per capita income of workers in larger scale plants. This means that the labor productivity advantage of larger firms largely benefits the owners of the firm and is not passed along to the workers. In many sectors this is not true. In textiles, the advantage is almost reversed; workers in large scale firms earn more than 50% more income per capita than do the owner/operators of small scale firms. From the findings in El Salvador it would appear that labor productivity is not a sufficient guide to estimate potential income benefit; the actual net income potential of large vs. small scale enterprises must be examined directly for each potential project.

Table 4-4
Comparison of Net Per Capita Incomes of Large Scale Agribusiness Workers and Small Scale Owner Operators, El Salvador, 1971

Subsector	Net Income per Capita Medium & Large Scale (US$)	Net Income per Capita Small Scale (US$)
Food Proc.	$147	$229
Coffee Proc.	$271	$215
Drinks	$412	$288
Tobacco	$189	$ 89
Textiles	$221	$144
Clothing	$156	$175
Leather	$300	$232
Shoes	$192	$323
Wood Prod.	$122	$175
Furniture	$222	$230
All Agroindustry	$212	$230

Source: Industrial Census, El Salvador, 1971.

iii. Expanding Small Scale Employment vs Entrepreneurial Opportunities

An intervention alternative could involve expanding wage earning income opportunities (employment) inside small scale enterprises or expanding entrepreneurial opportunities by attempting to create additional enterprises.

While **owner/operator** incomes in small scale enterprises are competitive with worker incomes in larger ones, **workers** in small scale enterprises are not so comparably paid.[4.16] From the Guatemala data presented in Table 4-5 it would appear that the income of workers in small scale enterprises is substantially less than that of owner/operators. This arises from two factors: first, the monthly remuneration of workers is significantly less than that of the owners (as shown in the table); and secondly, the number of months worked per year by workers is less than that of the owners (not shown in the table). While this may not be the pattern for all activities in all countries, it leaves the strong suggestion that empirical data on the precise trend within each country under study is a necessary element in the project intervention choice on whether to expand the number of enterprises or to expand the existing enterprises.

Table 4-5
Comparison of Owner/Operator Monthly Incomes in Small Scale Enterprises with Wage Earning Workers in Small Scale Enterprises

Sector	Wage Rate for Worker per Month	Net Income per Month for Men and Women Over 15 in Owner Family	Percent Supericrity of Owner Income per Month Worked
Wood Products	$65	$81	24.6
Textiles	21	32	52.4
Leather and Miscellaneous	31	47	51.6
Baking and Food Products	32	43	34.4
Commercial Services	28	60	114.3

Source: S. Daines computation based on person months worked for owner family members over 15 based on 1978 Rural Enterprise Survey by S. Daines, G Smith, Ministry of Agriculture (Guatemala), and BANDESA.

2. *Capturing the Entrepreneurial Energy in Existing Small Scale Enterprises*

Finding that net income per month worked, profit margins, and capital output indicators are very satisfactory for very small scale enterprises indicates that there is a vast potential for income and employment generation resting inside the enterprises owned and operated by the poor themselves. There are close to 18,000 small scale industries in El Salvador. The total number of small farms in El Salvador is approximately 250,000; this indicates that there is a small scale enterprise for each 10-15 small farms.

The surprisingly large number of small scale industries relative to the size of the sector seems to be the case in a number of other countries as well. We see in Table 4-6, for example, small firms with less than 10 persons representing substantial percentages of manufacturing employment. As might be expected, Oshima found the same pattern in other sectors as well:

> "In the major non-agricultural sectors of the Philippines (1961), firms engaging fewer than ten persons comprised 93 percent of the employment in construction, 94 percent in commerce, ... 64 percent in

4.16/ The question raised here of the relative incomes of owner/operators of small scale firms and employees of large firms is not often examined It is rather hidden in the more easily documented pattern of the lower wage rates received by employees of small scale enterprises compared to employees of large scale businesses, which is widely documented See, for example, Dhar and Lydall, *op. cit.*, for India; World Bank, *Employment and Development of Small Enterprises*, for Japan; H. T. Oshima, "Labor-Force 'Explosion' and the Labor-Intensive Sector in Asian Growth," *Economic Development and Cultural Change*, 19, No. 2 (January, 1971), pp. 161-183, for Singapore, South Korea, and Taiwan; D. Byerlee, "Indirect Employment and Income Distribution Effects of Agricultural Development Strategies: A Simulation Approach Applied to Nigeria," African Rural Employment Paper No. 9, Michigan State University, East Lansing, 1973, for Nigeria.

transport and communications, 95 percent in private services; in Taiwan (1961), 95 percent in commerce, 58 percent in transport, (and) 93 percent in services ... " (p. 165).

It is probable that the percentage of some of the first five countries is even higher than shown in the table, as some small scale enterprises were excluded from the census data.

If the number of enterprises is very large, the major problems are likely to be similar to the access problems of small farm interventions. From practical project design, administration, monitoring, and institutional points of view, projects oriented at interventions to assist small scale rural enterprises will be very much like small farm projects.

Table 4-6
Employment in Small Scale Firms as a Percentage of Employment in Manufacturing (percentage of total employment in manufacturing)

	Firms with Less than 10 Persons	Firms with Less than 50 Persons
Philippines (1961)	76%	83%
Taiwan (1961)	46%	60%
South Korea (1966)	43%	51%
Thailand (1964)	70%	79%
Singapore (1966)	45%	65%
Sierra Leone (1974)	na	96%
Nigeria (1970)	94%	na

Sources: Oshima, op. cit., Liedholm and Chuta, op. cit.

D Focusing Interventions on Maximizing the Backward Link Benefits to Small Farms

Agribusinesses (both small scale rural and large scale urban and rural enterprises) utilize farm and rural products as their major raw material inputs. Expansion of these industries will have important impacts on the suppliers of these inputs. This section deals with how to maximize these benefits for small farmers inside the poor rural target group.

1. Expansion of Large Scale Agribusiness vs. Improvements

The first factor which determines whether an agribusiness intervention will pass on large benefits to small farms relates to the nature of the intervention itself. If the intervention is directed at expanding agribusiness output, the logical result will be to require more raw material input. If the intervention is to change the technology of enterprises, to increase its profit margin, to improve its management or any other change which improves the business without expanding, it is not likely that additional raw material will be required and hence little benefit will be passed back to suppliers. It should be noted that there are intervention types which may actually result in a decreased requirement for raw material. One way to increase the efficiency and profit margin of an agribusiness firm is to increase the conversion rate of raw material into the final product. A feasible agribusiness intervention might be to reduce raw material waste in the agribusiness firm and this may reduce the raw material demand and actually injure

the incomes of raw material suppliers. Thus, the nature of the intervention type chosen (improvement vs. expansion) will have an important impact on the proportion of the benefit which is passed backward to suppliers, a part of whom may be small farmers and part of the target group.

2. *Raw Material Intensity of the Agribusiness Intervention*

Enterprises with different product types spend varying proportions of their total expenses on raw material. This proportion is here referred to as the raw material intensity of production. A project intervention will pass a larger part of its total benefit backward to suppliers if it is made in agribusinesses that have a higher raw material intensity. Table 4-7 presents one way of measuring raw material intensity for agribusinesses, which is to take raw farm products consumed as a percentage of the value of output. In soft drink beverages and tobacco enterprises, the raw farm product intensity is less than one-fourth as large as in the food processing enterprises. An intervention in tobacco processing, therefore, would pass a much lower proportional benefit backward than in food. Even inside the food processing sectors the differences are large. Choosing high raw product intensity sectors for project intervention is an important alternative for increasing the backward linkage of benefits to poor small farmers.

Table 4-7
Raw Material Intensity and Proportion of Raw Material Utilized
by Product Type in El Salvador, 1971

Subsector	Raw Material Intensity (Farm Product as a % Value of Production)	Percent of Output Captured by Small Farmers
Coffee Processing	56.9	6.0
Drinks	14.8	0.0
Tobacco	21.1	8.2
Textiles	44.7	2.8
Clothing	50.1	3.2
Leather	51.7	14.2
Shoes	41.3	11.2
Furniture	36.7	0.0
Detailed Food Industry		
Meat Products	72.0	19.7
Milk Products	54.1	14.8
Fruit & Vegetable	27.6	8.2
Edible Oils	61.7 Imported	2.2 Imported
Flour Milling	66.9 Imported	3.3 Imported
Baking	47.2 Imported	2.2 Imported
Sugar/Panela	50.5	7.7
Candy Products	38.4	5.8

Source: S. Daines & D. Steen, **El Salvador Agroindustrial Profile** (San Salvador: A.I.D., 1977), 69 p., page 264.

A related problem is the possibility that the raw material is imported and that no benefit is therefore passed backward. Table 4-7 presents examples of agribusinesses which have very high raw material intensities (edible oils 61.7 and flour 66.9), but which will pass little benefit backward because their raw farm product is imported.

The overall raw material intensity of small scale enterprises in India, including the proportion of imported raw materials can be seen in Table 4-8.

Table 4-8
Study of Selected Small Industrial Units in India
Consumption of Raw Materials: 1969-70

	Total (Rs.'000)	Indigenous[a] (Rs.'000)	Imported[a] (Rs.)	Per Unit Value Added (Rs/)	Per Unit of Output (Rs.)
Agricultural Implements	6,748	6,643	105	2.02	0.61
Auto Ancillaries	8,627	6,778	1,277	2.05	0.59
Cycles and Components	5,856	5,723	133	2.82	0.68
Electricals	20,156	12,808	378	1.72	0.60
Electronics	4,280	3,272	622	2.37	0.64
Batteries	301	130	170	7.37	0.85
Light Engineering	7,772	6,933	839	1.23	0.50
Hardware	3,902	3,410	492	2.33	0.66
Steel Furniture	2,786	2,765	21	1.48	0.56
Utensils	3,652	3,652	–	1.47	0.54
Plastics	4,029	2,789	384	2.94	0.66
Rubber Products	2,061	1,686	371	0.62	0.36
Scientific Instruments	2,400	2,008	227	1.14	0.49
Surgical and Hospital Equipment	964	552	412	1.91	0.62
Paints and Varnishes	6,525	4,500	1,537	4.46	0.75
Pesticides and Agri-chemicals	1,709	693	597	2.32	0.61
Soap	2,739	1,994	485	4.42	0.79
Hosiery	8,631	8,631	–	6.80	0.78
Printing	3,081	444	263	1.96	0.54
Food Processing	1,374	1,339	34	2.11	0.60
Timber-based Industry	612	612	–	2.62	0.71
Sports Goods	3,010	2,610	400	2.37	0.64
All Industries	101,214	79,972	8,750	2.00	0.61

[a]For reporting units.
Sources: National Council of Applied Economic Research, **Study of Selected Small Industrial Units** (New Delhi: NCAER, 1972), p. 62.

3. *Proportion of Raw Product Supplied by Small Farmers*

The raw material supplied to agribusinesses does not all come from small farms whose families are members of the target group poor. Large farms may supply a very large proportion of it for certain products. In the event that the raw material is supplied by large farms, expanding the demand for raw material will benefit the poor only as they are workers on the larger farms, which is an employment benefit, but not a benefit to small farmers. There are two project intervention alternatives which will increase the impact of projects on the welfare of small farmer families:

1. Select agribusinesses for project interventions which process those products for which small farms predominate in primary production.
2. Arrange the project so that part of the intervention itself structures the supply of raw material so as to require or at least raise the probability that small farms are the input suppliers.

a. *Selecting Products for which Small Farms Predominate in Primary Production*

Since there are large differences by product in the proportion of output which is produced on small farms, it would initially appear that a viable way to increase the backward link benefit accruing to small farm families would

be to choose agribusinesses which process traditional small farm products. Table 4-9 presents an example of such a computation for El Salvador in which the small farm share of production for each of the raw material types is indicated. The obvious implication for agribusiness interventions in El Salvador is that even if small farms capture their proportional share of agribusiness demand for raw product, less than one-third of that demand would come from their production. The backward link, while not unimportant, is relatively small. This pattern for El Salvador, of course, should not be assumed for other countries. It does emphasize, however, the importance of measuring the backward linkage for each country to determine the potential of agribusiness interventions for the small farmer. It should be additionally noted that even though the average backward link is small, the differences by product are large. Coffee processing would pass a much smaller proportion of its total benefit backward (less than half) than would tobacco or meat products.

The fact that in reality small producers will not likely capture their proportionate share would result in an actual lessening of the impacts indicated in Table 4-9. Large farmers are more institutionally agile, and viewed by processors as more stable and higher quality suppliers. It is therefore likely that when given a choice, most agribusinesses would probably choose the large farm suppliers.

Table 4-9
Small Farm Share in Primary Production in El Salvador, 1970

Subsector	Small Farm Share of Primary Production
Coffee Processing	13.1%
Drinks	0.0
Tobacco	48.2
Textiles	8.0
Clothing	8.0
Leather	34.2
Shoes	34.2
Furniture	0.0
Total Non-Food	
Detailed Food Processing	
Meat Products	34.2
Milk Products	31.7
Fruits & Vegetables	37.5 (Part Imported)
Flour Milling	30.5 (Most Imported)
Bakery Products	30.5 (Most Imported)
Sugar/Panela	18.9
Candy/Chocolate	18.9
Total Food Processing	

Source: Agriculture Census, El Salvador, 1970.

b. Restructuring the Supplier Connections to Favor Small Farms

The second alternative is to have the agribusiness project itself contain provisions which insure that small farms are the only or principal suppliers of raw product. Using cooperative mechanisms for processing in which small farmers actually own and operate the agribusiness is the extreme example of how a project intervention could accomplish this restructuring of supply source. A wide variety of subsidies, institutional arrangements and project

conditions can be envisioned to accomplish the restructuring. Locating agribusinesses in geographic areas where small farms predominate, using the agribusiness as the channel for small farm credit, extension of technical know-how, transportation of produce to processor and other project instruments, may serve this function.

4. Net Small Farmer Impact Potential

The two major factors which determine how much of a given expansion will be passed backward to small farmers (raw material, intensity, and small farm share in supply) interact in creating the magnitude of net small farm impact resulting from expansion of an agribusiness. Table 4-7 (last column) presents for El Salvador this net small farmer share in the value of output of agribusiness enterprises. For example, an expansion of $100 of output (or an increased demand) from small farms if they capture the same share of processing supply that they do of total meat (processed and unprocessed) supply.

This type of net impact table could be useful in helping project designers choose the product type for project intervention so as to maximize benefits for the small farmer.

E. Specific Types of Interventions

The discussion so far in this chapter has dealt with a framework for choosing interventions which will maximize the benefits of agribusiness and rural enterprise projects for the rural poor. The discussion in the present subsection deals with the intervention types themselves and provides a short description of each, followed by some illustrative examples from past A.I.D. projects.

1. Training: Short-term courses, on-the-job guidance, self-education aids, and preparatory training are some of the more common means used to transfer relevant technical or managerial information. Instruction in basic accounting, marketing (e.g., demand analysis, promotion, distribution), production (e.g., planning, quality control), finance, and organization (e.g., personnel, organizational structure) can enable the manager to improve his/her operations. On-the-job short-term training tends to be most useful when it is directly relevant to the entrepreneur's business problems. In addition, as small firms are often hard-pressed to release key individuals who could benefit most from training, courses which are most effective tend to be short and followed up by on-site visits.

A SMRE (Small and Medium Scale Rural Enterprise) requires skilled laborers. Formal preparatory vocational training can contribute to the development of a more skilled labor force. In most countries, such training is accomplished through apprenticeships of the like which, although effective in transmitting skills, may perpetuate inefficient practices.[4.17] Courses attuned to local employment opportunities can equip students with new or improved skills and thereby improve the performance of the SMRE.[4.18]

2. Research Services: Techno-economic services, which are often included within one or more existing government or private institutions, often include economic research such as general statistics by industry, market surveys, and industry feasibility studies, and technical research on production processes and appropriate/modern technology. As the objective of such services is to provide the necessary knowledge for the entrepreneur to make

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4.17/ Apprenticeship training would appear to be frequently used among small scale industries. See Child and Kaneda, *op. cit.*, p. 253 (Pakistan) and Liedholm and Chuta, *op. cit.* (Sierra Leone), p. 46; and W. F. Steel, *Small-scale Employment and Production in Developing Countries: Evidence from Ghana* (New York: Praeger, 1977), p. 77 (Ghana).

4.18/ World Bank, *Non-Farm Employment*, p. 64.

well-informed business decisions and the government to improve policy affecting that entrepreneur, the research services must be closely attuned to the needs of the country's SMREs. It is therefore important to establish effective communication between organizations such as extension services which are familiar with the specific needs of target industries and which can assist in disseminating relevant information.[4.19] Some research services which have been included within organizations with wider responsibilities have suffered due to low priority relative to other tasks.[4.20]

3. Advisory Services: Managerial and technical advice in all critical areas, i.e., marketing, production, accounting, management, and finance, is usually offered through a variety of mechanisms. In some programs, the government develops and supports an extension service within an existing body such as the Department of Industry. Unfortunately, government bodies have frequently been unable to recruit and retain highly qualified agents; civil service regulations limit the salaries and promotional opportunities, and those with real business acumen usually go into business themselves.[4.21] In addition, many governments have been slow in committing adequate resources to technical assistance agencies, thereby seriously handicapping their ability to service SMRE entrepreneurs.

To get around these problems, some programs have assisted in developing and/or funding both nonprofit and profit organizations which provide technical assistance (TA) alone or in combination with other services. For example, TA services have been included as part of the function of credit institutions. This arrangement can increase the incentives for the consulting group to provide useful and effective services so as to improve the probability of being repaid, but it can also reduce the credit institutions' objectivity in reviewing loan applications.

Whether public or private institutions provide the assistance, rural industry is not always eager to make use of it. There is frequently a "lack of education, personal hostility to the source (e.g., distrust of a government agent), resistance to the extension method, cultural resistance to innovation, or a lack of (necessary) complementary resources."[4.22] To ensure that services are adequately utilized, the project should be designed to minimize these difficulties. For example, TA could be oriented towards newer industries which tend to be more receptive to outside advice, or credit components could be available to businesses which decide to use the technical knowledge provided but need additional funding to do so.

When the difficulties in encouraging rural industry to use TA services have been minimized, those services which are specifically tailored to the entrepreneur's operations can be extremely useful in identifying and solving specific constraints. Some of the more useful TA programs have been implemented by larger firms dependent on the small supplier (see subcontracting).

4. Credit Programs: Rural entrepreneurs frequently identify credit as their primary problem. Although in many cases credit is a major constraint, there are often other problems.[4.23] Consequently, programs offering credit alone are often not effective in addressing the other constraints. Hence, though credit needs clearly need to be addressed, other factors should also be reviewed and perhaps included as project components.

4.19/ UNIDO, *Technical Services for Small Scale Industry*, pp. 9, 21.

4.20/ A. U. Khan, "Appropriate Technologies: Do We Transfer, Adapt, or Develop?," *op. cit.*, pp. 230-231.

4.21/ These types of problems, for example, were experienced in Jamaica by the Small Business Loan Board and the Small Industries Development Division of the Jamaica Industrial Development Corporation which provided credit and technical assistance to small enterprises.

4.22/ J. E. Stepanek, *Small Industry Advisory Services* (Glencoe, Illinois: The Free Press, 1960), p. 16.

4.23/ In one survey in Kenya, 62% of the shopkeepers surveyed stated that the shortage of capital was their greatest problem. Examination of the firms, however, found a number of other constraints. M. Harper, "The Employment of Finance in Small Business," *Journal of Development Studies*, 2, No. 4 (July, 1975), pp. 366-375. A study in Nigeria concluded that the shortage of viable project proposals was more critical than capital availability. See S. P. Schatz, "The Capital Shortage Illusion; Government Lending in Nigeria," *Oxford Economic Papers*, 17, No. 2 (July, 1965), pp. 309-316. This finding was based on the author's experience in a lending institution which received insufficient numbers of viable loan applications, and presumes, of course, that the most viable possible projects in the field were in fact presented to this entity.

Facilitating the flow of credit is a multifaceted problem. If efforts to change policy or improve capabilities of SMRE entrepreneurs are successful, those enterprises may become more attractice customers for private commercial/development banks.

Macropolicies in particular have a significant, if not the dominant, influence on lending activities. One of the first steps should be to ensure that such policies do not discriminate against the smaller, labor-intensive enterprises. Any government intervention should support credit and other resource allocations in the direction of true scarcity, though identifying the critical variables to achieve this end has proven difficult.[4.24] (In general, the countries which have shown the most rapid increase in manufacturing output have been those which have adopted prices for capital and labor reflecting their relative scarcity.)[4.25]

A more direct approach includes providing concessional loan funds for long-term and working capital which allow sufficient spread to cover increased administrative costs, loan defaults, and even TA. The Latin American Agribusiness Development Corporation (LAAD) is one example of a recipient of such funds. A loan to Peru beginning FY'77 is another. These funds can provide the lending institution valuable experience in lending to a group of new customers, can assist in getting certain rural enterprises started, and can provide the badly needed working and long-term capital often needed in the rural sector of capital-short economies.

Provision of such funds, however, may represent only short-term solutions. Unless the costs and risks in lending to SMREs are reduced, the lending institutions may not be able to maintain a viable SMRE program once concessional funds are no longer available.

Another direct approach is development of guarantee schemes to make the higher risks more acceptable to lending institutions and to encourage those institutions to ease their collateral requirements. Experience indicates that such schemes should minimize the time and effort involved for credit institutions to obtain government guarantees. While guarantees can reduce risk, however, alone they do not always provide adequate incentive for private lenders to get involved in a new and still relatively unattractive area of lending. Also, if not carefully designed, they can result in a costly review process at two levels, that of the lending institution and the government body providing the guarantee.

Another approach is improving the capabilities of lending institutions which express reluctance to move into this area because of lack of trained personnel. TA can be directed toward developing bankers' skills in credit analysis, monitoring, and packaging to enable them to deal effectively with smaller, rural customers.

In countries where banking facilities are not situated so as to have direct contact with potential SMRE customers, other mechanisms are sometimes employed to identify customers and establish contact between the borrower and the lender.[4.26] In addition, policy or government-controlled incentives can be used to encourage movement of lending enterprises to rural areas.

5. Facilitating Procurement of Raw Materials/Equipment: Facilitating procurement of raw materials/equipment can involve several approaches. First, basic policies affecting the scarcity of goods, e.g., those related to inflation, foreign exchange, or capital formation, should be reviewed to avoid any unnecessary shortages. Second concerted efforts to improve the efficiency and effectiveness of the purchasing and distribution system must be

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4.24/ A. S. Bhalla, *Technology and Employment in Industry* (Geneva: International Labour Office, 1975), p. 319.

4.25/ E. Owens and R. Shaw, *Development Reconsidered* (Lexington, Massachusetts: D. C. Heath & Co., 1974), p. 109.

4.26/ See USAID Nigeria, "Indigenous Industrial Development," Non-capital Project Paper No. 620-714 (1969), p. 22.

made. Increased availability of information on supply and demand conditions can minimize the vulnerability of smaller rural entrepreneurs. Specific training in inventory planning and control can improve distributors' and entrepreneurs' performance.[4.27] Efforts can be made to encourage enough independent distributors to minimize monopoly control of supply channels, though care must be given to avoid fragmenting distribution functions that require a minimum scale for efficiency.[4.28] Also, purchasing organizations (e.g., cooperatives) can be formed to allow for the economies of bulk purchases. Such organizations, however, should not be regarded as panaceas; they will not remedy problems resulting from poor distribution or scarcity.[4.29] Also, a cooperative type arrangement may have difficulties attracting trained managers.

Medium-scale operations relying on small suppliers in particular can improve raw material purchasing through establishing incentives for a steady, adequate supply of material. Contracts, for instance, allow greater price stability to both supplier and purchaser and offer an assured market to the supplier, thereby encouraging his participation.

6. Marketing Aids: Aside from training and advisory services directed toward improved marketing, other approaches include improving the flow of market information, strengthening associations, and/or providing government or cooperative outlets for goods.

Better market information has often been included as part of the research service function. The government can perform market analyses or compile trade directories. In addition, efforts to encourage industrial associations or private firms to adopt such responsibilities can also be undertaken.[4.30]

Publicly-owned outlets have frequently been established to purchase exclusively from small and/or rural firms. Many such efforts have met with substantial difficulties due to poor planning and/or to the nature of most government operations. Government-operated outlets tend to be less able to make business decisions quickly and to provide incentives to managers to ensure aggressive selling.[4.31] However, in state-run economies or where the government takes on this responsibility, the approach could be one of providing management, TA and/or training.

Another approach, which can be somewhat similar to subcontracting, includes facilitating cooperation between small and large firms. Large wholesale or retail operations can provide valuable market information and outlets for small firms and often provide TA and credit. Information exchange through clearinghouses of other means can enable firms with complementary needs to identify one another.

7. Subcontracting: Subcontracting is generally used to refer to a relationship between large and small industries where the smaller firms manufacture parts and components or perform processing and finishing operations needed by larger firms.[4.32] Information exchanges on the needs of larger industries and the specific capabilities of

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4.27/ For an example of this problem in Kenya, see M. Harper, *op. cit.*, pp. 369-374.

4.28/ K. Hart, "Small-Scale Entrepreneurs in Ghana and Development Planning," *Journal of Development Studies*, 6, No. 4 (July, 1970), pp. 104-120.

4.29/ D. A. Rondinelli and K. Ruddle, *Urbanization and Rural Development: A Spatial Policy for Equitable Growth* (New York: Praeger, 1978), pp. 97-99.

4.30/ Stanley and Morse, *op. cit.*, p. 381.

4.31/ *Ibid.*

4.32/ This type of relationship has been frequently used in the Far East, especially Japan. See, for example, S. Paine, "Lessons for LDCs from Japan's Experience with Labour Commitment and Subcontracting in the Manufacturing Sector," *Bulletin of the Oxford Institute of Economics and Statistics*, 33, No. 2 (May, 1971), pp. 115-133; S. Watanabe, "Reflections on Current Policies for Promoting Small Enterprises and Subcontracting," *International Labour Review*, 110, No. 5 (November, 1974), pp. 405-419.

Over the last fifteen years, international subcontracting on an inter-country basis has been expanded enormously, in which multinational firms have created a number of large sized, labor-intensive firms in developing countries to carry out the labor-intensive processing phases of production. See M. Sharpston, "International Subcontracting," *Oxford Economic Papers*, 27, No. 1 (March, 1975), pp. 94-135; and G. K. Helleiner, "Manufactured Exports from Less Developed Countries and Multinational Firms," *The Economic Journal*, 83, No. 329 (March, 1973), pp. 21-47.

SMREs facilitate development of these mutually beneficial relationships. Usual mechanisms include development of clearinghouses or utilization of TA agencies as information conduits. A large firm usually chooses to subcontract when it is uneconomical for it to perform the function itself (e.g., the volume demanded for a specific part does not justify purchase and operation of necessary equipment) or when government legislation prohibits its operation in specific areas.

To establish a viable relationship, the smaller supplier must operate efficiently and produce goods of reasonable quality. In many subcontracting relationships, the larger firm provides some technical and managerial assistance, which can be highly effective due to its specific nature, and may provide credit.

Subcontracting relationships can offer the small firm a more secure outlet and can significantly improve access to marketing information, thereby allowing increased responsiveness. As overdependence on one purchaser reduces the small firm's flexibility and limits control over price and related factors, the smaller enterprise must evaluate the risks and returns for itself.

Given that the larger private firms can provide product-specific assistance and have a financial stake in ensuring their supply is adequate and of high quality, it is reasonable to expect that smaller firms may benefit more from improved commercial contacts than most other forms of assistance.

F. Specific Examples of Past Efforts

A.I.D. and other donors have had some experience in supporting projects to assist SMREs. Much of that experience highlights the difficulties in designing effective projects. Following is a description of projects representative of general past A.I.D. approaches.

1. Support of Technical Assistance Centers: "Indigenous Industrial Development," 620-714 (Nigeria, FY'62-71—$3,360,000 grant). Objective: To develop small and medium scale indigenous industries. Means Financial and technical assistance to Industrial Development Centers (I.D.C.'s) which were to:

   a. Provide technical and management assistance to small entrepreneurs through on-the-job counseling and short seminars.
   b. Prepare feasibility studies for credit institutions.
   c. Train indigenous staff to assume responsibility for continuing an effective program after USAID support was terminated

The project was evaluated in 1972 as having been fairly successful; the evaluation stated that many entrepreneurs had made use of the centers and had obtained financing as a result of the IDC's assistance. The reasons cited for the success of IDCs were the centers' specialization in five industries, the design of course content around specific needs identified by entrepreneurs and IDC field teams, as well as the post-seminar follow-up visits, and the coupling of IDC activities with credit availability offered through separate institutions.

In contrast, Uma Lele[4.33] argues that the project was not especially successful. Rather than a focused program offering adequate on-site follow-up, she points out that the centers were too wide-ranging in industries covered (e.g., auto repairing to leather working) and that on-the-spot technical assistance was not adequately provided. In addition, the businessmen who were able—with considerable difficulty—to attend the one-week seminars

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4.33/ *The Design of Rural Development* (Baltimore: The Johns Hopkins University Press, 1975).

found them either too general or not especially relevant. Many of these problems have been attributed to the shortage of trained staff.

In addition, Lele implies that the program was developed without adequate underlying demand. "It is only where rural enterprises enjoy a buoyant demand for their services that increase in their profitability can occur."[4.34]

2. Financial Assistance Through Existing Institutions: "Small Business-Earthquake Zone in Peru" (Peru, FY'72-75, $2,446,152 loan). Objective: Credit to small and medium enterprises located in the post-earthquake area in order to:

a. Re-establish and develop local industry and commerce;

b. Stimulate production of goods and provision of services;

c. Generate employment opportunities; and

d. Stimulate private initiative.

Means: Financial, technical and administrative support to establish and operate a fund in the Central Reserve Bank of Peru. Fifty thousand dollars was included for TA, including the preparation of the credit manual, training, and project promotion. The balance was intended to allow for financing of subprojects identified/studied by the implementing agency and local financial institutions. The financial intermediaries and borrower had to provide some of the counterpart financing.

Evaluation (Loan Completion Report): A total of 202 short and medium term loans were made over the life of the project at an average cost of $3,159 per job created. Although several loans were made, the project did run into several difficulties. The major problems cited included:

1) Subprojects did not receive necessary TA or supervision during implementation and hence required additional supervision after disbursement. The primary reasons for this were the lack of commercial incentive in the original project for financial institutions to ensure sound investment and repayment, and an ambiguous allocation of responsibility for subproject supervision between financial agents and ORDEZA, the government agency responsible for TA and credit review.

2) Institutional impact was short-lived as the financial institutions did not have any incentive to continue with the program once concessional funds were initially disbursed.

3) ORDEZA suffered from a conflict of interest due to involvement in both technical design and credit approvals.

4) Uneven GOP support was provided due to a budget crunch in 1974 and 1975.

5) ORDEZA did not adequately utilize the available funds for TA.

3. Financial and Technical Assistance Through Specialized Institution: "LAAD Agribusiness Development," 596-011 (Central America, FY'72-75, $6mm loan); and 596-015 (FY'75-78, $5mm loan). Objectives of first loan:

a. To support and substantially augment the capabilities of a unique regional private sector effort to deal with Central American agribusiness as a total interrelated process, with the emphasis on the promotion of non-traditional exports.

b. To contribute to the development of a capital market in Central America as a continuing source of financing for agricultural development. Means:

4.34/ *Ibid.*, p. 116.

1) Use of A.I.D. and other funds to promote and finance agro-industrial enterprises.

2) Use of shareholders' (U.S. agribusiness companies) services and A.I.D. funds to provide technical assistance and feasibility studies for subprojects.

3) Investment in and resale of subprojects' equity.

Objectives of the second loan:

a. To continue support of the private agribusiness sector with increased support for participation of the rural poor.

b. To develop LAAD into a self-sustaining financial operation based on commercially available capital.

Means: The first and second means employed in the first loan were to continue with increased emphasis on labor-intensive subprojects with strong backward linkages, as required under the congressional mandate, which was introduced after the first loan. The third means, development of the capital market, was de-emphasized as LAAD had not been able to sell its equity easily and the A.I.D. requirement that LAAD had to lend two-thirds of its loan funds for long-term financing with equity features had caused it to become "unnecessarily involved" in very high risk businesses.

Evaluation: An evaluation presented by Checchi and Company on November 23, 1977, states that LAAD has been successful in encouraging the development of nontraditional exports and that small farmers have benefited from assured markets for higher value crops and greater price stability when processing plants have entered into contracts with them. Similar to experience in many small industry projects where those entrepreneurs most receptive are already in business, many farmers who have been most receptive to new product and marketing techniques have been those already active in commercial agriculture.

In terms of direct employment generated, LAADs subprojects appear capital-intensive, with the average cost per job at $16,393. The capital-intensive operations are judged necessary to manufacture products competitive in the international market. Indirect employment generated—i.e., small farmers involved in production—is estimated to be substantial and may offset the high cost per job of the plants themselves. Unfortunately, the evaluators were not able to estimate the indirect impact with any degree of confidence. The technical assistance offered by processing plant employees to small farmers in particular appears to have been quite effective due to its product-specific nature.

CHAPTER FIVE: APPROPRIATE TECHNOLOGY AND LOCAL PARTICIPATION

A. Introduction

A theme which has received increasing attention has been the need for more appropriate technologies and local participation in the development process of less developed countries.[5.1] The concept of "appropriate technology" (AT) has received an enormous amount of attention since the early seventies, yet it remains a controversial subject and its proponents share a broad spectrum of philosophies regarding both its basic rationale and its practical application.[5.2]

The concept of AT was in part one of the outgrowths of the criticism which gradually emerged as large-scale industrialization and modernization strategies for developing countries seemed to provide few positive results. Development efforts neither improved the severe employment situation in the LDCs nor distributed the benefits of growth in an equitable manner. In reality, the industrialization strategy encouraged migration from the countryside to the cities where there were few opportunities and urban problems were severely exacerbated.[5.3]

This criticism led to a number of explanations of the causes of the modest achievements of twenty-five years of development efforts. From this emerged the general recognition that the past strategy had focused too much upon the LDCs duplicating the capital-intensive industrial structure of the developed countries through the direct transfer of "Western technology," when their own factor endowments favored labor-intensive and local natural resource intensive production.[5.4]

5.1/ For bibliographies on the subject of "appropriate technology," see D French, *Appropriate Technology in the Social Context: An Annotated Bibliography*, USAID PPC/PDA/CP, 1977; M. Carr, *Economically Appropriate Technologies for Developing Countries: An Annotated Bibliography* (London: Intermediate Technology Development Group, 1976); and G. Jenkins, *Non-Agricultural Choice of Technique: An Annotated Bibliography of Empirical Studies* (Oxford: The Institute of Commonwealth Studies, 1975)

The name often used to describe the concept treated here will vary depending upon the subject matter treated, the philosophical bias of the author, and the approach taken. Common variations in the literature include: intermediate technology, alternative technology, soft technology, adaptive technology, indigenous technology, village technology, people's technology, low-cost technology, capital light technology and labor-intensive technology

5.2/ See, for an example of this range, R. S. Eckaus, *Appropriate Technologies for Developing Countries* (Washington, D.C.: National Academy of Sciences, 1977); N. Kaldor, "Advanced Technology in a Strategy of Development," *Automation in Developing Countries* (Geneva: International Labour Office, 1972), pp 3-16; K. Marsden, "Progressive Technologies for Developing Countries," *International Labour Review*, 101, No. 5 (May, 1970), pp. 475-502; A. S. Bhalla (ed.), *Technology and Employment in Industry: A Case Study Approach* (Geneva: ILO, 1975), which includes a number of articles on some central issues; N. Jequier (ed.), *Appropriate Technology—Problems and Promises* (Paris: Organization for Economic Cooperation and Development, 1976); and E. F. Schumacher, *Small is Beautiful: A Study of Economics as if People Mattered* (London: Blond and Briggs, 1973). Schumacher's book, of course, did much to popularize the issue and make him the prophet of some of the more radical conceptualizations of appropriate technology.

5.3/ G. Ranis, "Industrial Sector Labor Absorption," *Economic Development and Cultural Change*, 21, No 3 (April, 1973), pp. 387-408; while some have admitted the existence of problems caused by rapid migration, the argument has been made that it has been beneficial to migrants. "International Migration and Economic Development in Brazil," *Quarterly Journal of Economics*, 90, No. 1 (February, 1976), pp. 119-137.

5.4/ H. Pack and M. Todaro, "Technological Transfer, Labour Absorption, and Economic Development," *Oxford Economic Papers*, 21, No. 3 (November, 1969), pp 395-403; Morawetz, "Import Substitution, Employment, and Foreign Exchange in Columbia: No Cheers for Petrochemicals," *The Choice of Technology in Developing Countries: Some Cautionary Tales* (Cambridge, Massachusetts: Harvard Studies in International Affairs, 1975), pp. 97-107.

It became recognized that technological alternatives had to be examined and chosen with greater care to ensure that those most appropriate to the factor endowments of the locality of an activity were selected. In terms of LDCs, of course, this generally means technologies should be employed which are intensive in the use of abundant factors (labor and natural resources) and light in the use of scarce resources, capital and highly trained personnel. For this reason it is often referred to as "capital light" or "low cost" technology.[5.5]

Appropriate technology, however, has come to mean many things to many people, and there are many issues unresolved with regard to its practical application. This chapter will examine some of those issues and their relationship to small scale rural and agribusiness projects.

B. Why Inappropriate Technologies were Applied

Both economic/political and institutional factors have contributed to the use of inappropriate capital-intensive technologies in LDCs.[5.6] On the economic side, inappropriate technologies received encouragement from both development planners enamored with the industrialization and modernization strategy as well as local policies implemented for both political and economic reasons. Both of these factors led to the artificial raising of the cost of labor through minimum wage and social security laws[5.7] and the artificial lowering of capital costs through interest rate ceilings, tariff exemptions for imported capital, etc.[5.8] Following the signals of the market place, the private sector was encouraged to adopt capital-intensive technologies in LDCs.

From an institutional point of view, it was natural for international lending agencies and local development institutions of LDCs to defer to engineers educated with labor saving techniques in mind and to large companies which could deliver familiar and tested techniques with a minimum of risk and in a short period of time with reliable on-going servicing. Since the companies were themselves most familiar with "modern" techniques developed in the context of the developed countries, and since leaders in development institutions of LDCs were often educated

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5.5/ This is the definition commonly used for A.I.D. purposes. The interest in appropriate technology in the U.S. is shown by a congressional appropriation of $20 million and the creation of A. T. International to finance activities in the field of light capital technology over a three-year period (fiscal 1976/78)

It might be noted that the concept of AT is based on the presumption of factor substitutability, an issue which has been debated for some time The amount of literature on the issue is voluminous: see L. J. White, "Appropriate Factor Proportions for Manufacturing in Less Developed Countries: A Survey of the Evidence," Research Program in Development Studies, Discussion Paper No. 64, Woodrow Wilson School of Public and International Affairs, Princeton University, New Jersey, 1976; and D. Morawetz, "Elasticities of Substitution in Industry: What Do We Learn from Econometric Estimates?," *World Development*, 4, No 1 (January, 1976), pp. 11-15, which tend to confirm the position of substitutability Past studies were often criticized for focusing on too aggregate a level of industrial groupings, which led to more recent investigations often being carried out at a micro level. See, for example: H Pack, "The Employment-Output Trade-Off in LDCs—A Microeconomic Approach," *Oxford Economic Papers*, 26, No. 3 (November, 1974), pp. 388-404; and Y. W. Rhee and L. E. Westphal, "A Micro, Econometric Investigation of Choice of Technology," *Journal of Development Economies*, 4, No. 3 (September, 1977), pp. 205-237.

5.6/ In the early 1970s, for example, social security contributions by employers in some industries in Chile represented up to 50% of wages.

5 7/ See, for example, C. Cooper, "Science, Technology, and Production in the Underdeveloped Countries: An Introduction," *Journal of Development Studies*, 9, No. 1 (October, 1972), pp 1-18; E. Cordova, "Labour Legislation and Latin American Development: A Preliminary Review," *International Labour Review*, 106, No. 5 (November, 1972), pp 445-474; and M. Roemer, "The Neoclassical Employment Model Applied to Ghanaian Manufacturing," *Journal of Development Studies*, 11, No. 2 (January, 1975), pp. 75-92.

5 8/ For a review of the reasons most commonly considered, see W. Baer, "Technology, Employment and Development: Empirical Findings," *World Development*, 4, No. 2 (February, 1976), pp. 121-130.

in developed countries where such techniques were taught, the bias in favor of capital-intensive processes to the prejudice of local labor and natural resource intensive techniques was quite natural, if somewhat irrational.[5.9]

There were, however, additional factors contributing to this distortion of techniques. Certainly two important elements were the general lack of readily accessible information regarding alternative technologies,[5.10] in addition to the problem that nobody was looking for them anyway.[5.11] Also, the fact that major lending institutions of the developed countries tied assistance loans to purchases in their own countries encouraged a capital-intensive bias.

Appropriate technology offered a way of impacting employment, income distribution, and migration problems by focusing production processes on labor-intensive technology. It allowed a focus on the rural, traditional sector with links to agriculture in addition to offering small scale production[5.12] which would not require concentration of economic activities in the cities, but allow their dispersion throughout geographical regions. And most importantly, it would maximize employment and income distribution goals through the more judicious use of scarce capital by employing more of the poor per unit of capital, especially those who had traditionally had no access to it.

Appropriate technology has been attractive for not only its economic implications, but also for its applicability to other socioeconomic problems proponents have identified as arising from the industrialization strategy. Appropriate technology is seen by some as a solution to some of the perceived ecological problems caused by large

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5.9/ For illustrations of such problems in Indonesia and Bangladesh, see C. P. Timmer, "The Choice of Technique in Indonesia," and J. W. Thomas, "The Choice of Technology for Irrigation Tubewells in East Pakistan: Analysis of a Development Policy Decision," in *The Choice of Technology in Developing Countries;* see also J. Roberts, "Engineering Consultancy, Industrialization, and Development," *Journal of Development Studies*, 9, No. 1 (October, 1972), pp. 39-62. For an insightful article regarding management transfer problems, see J. R. Moris, "The Transferability of Western Management Concepts and Programs, an East African Perspective"; L. D. Stifel et al. (eds.), *Education and Training for Public Sector Management in Developing Countries* (New York: Rockefeller Foundation, 1977).

5.10/ This case is illustrated by the development of a machine to produce egg trays in Zambia by the Intermediate Technology Development Group, Ltd., of Schmacher. Zambia had exported waste paper and imported egg trays. The smallest existing machine had an output of a million trays a month (the annual requirement of Zambia was 1 million), and cost about 200,000 pounds. The group developed a "scaled-down" machine which had an annual output of one-third million and a capital cost of 8,500 pounds, using waste paper previously exported. See P. Lofthouse, "Case Histories of Successful Operational Programs—Case No. 1, Intermediate Technology Development Group, Ltd.," in *Proceedings of The Conference and Seminar on Techniques and Methodologies for Stimulating Small-Scale Labor-Intensive Industries in Developing Countries*, D. E. Lodge and K. E. Auciello (eds.), (Atlanta: Georgia Institute of Technology, Engineering Experiment Station, 1975).

5.11/ It is perhaps more accurate to say that planners were not looking. This is illustrated in the development of a small motorized water moving pump in Viet Nam in the 1960s. The pump was developed by several Vietnamese in different places without outside help. The pump served to lift irrigation water from ditches to water a second rice crop during the dry season. The pump was lightweight and light capital-intensive, so it was rented and movable from farm to farm. When foreign technicians were questioned regarding the device, they dismissed the invention as "inefficient" despite the lack of formal investigation, although their public affairs people were favorably impressed. R. L. Sansom, "The Motor Pump: A Case Study of Innovation and Development," *Oxford Economic Papers*, 21, No. 1 (March, 1969), pp. 109-121. See also C. Cooper et al., "Choice of Techniques for Can Making in Kenya, Tanzania, and Thailand," A. S. Bhalla (ed.), *Technology and Employment in Industry, op. cit.*, pp. 85-121.

5.12/ In some industries, capital-intensive techniques are favored to achieve economies of scale, regardless of low labor costs. See F. Stewart, "Manufacture of Cement Blocks in Kenya," and G. K. Boon, "Technological Choice in Metal-working, With Special Reference to Mexico," in *Technology and Employment in Industry*. It is argued, however, that many processes, through technological innovation and adaptation, can be scaled down and still be economically viable; and/or the "core" processes can be left capital-intensive while peripheral activities made more labor intensive. See M. Brown, "Appropriate Technology for Industry in Developing Countries (with Special Reference to Scale of Production and Employment Creation)—Some Reflection on Research Implications," Organization for Economic Cooperation and Development, Development Centre Occasional Paper No. 15, February, 1977. B. V. Mehta, "Size and Capital Intensity in Indian Industry," *Bulletin of the Oxford University Institute of Economics and Statistics*, 31, No. 3 (August, 1969), pp. 189-204. White, *op. cit.*, p. 26, concluded that labor intensive processes appear most applicable where either the scale production is lower or where wages were lower. The question of the commercial viability of such operations is often raised but left unanswered.

scale industry, including the depletion of nonrenewable resources such as fossil fuels. The frequent suggestion of solar pumps for irrigation purposes is illustrative of this aspect.[5.13]

Fundamental to the AT philosophy is the potential cultural and social impacts of the concept. Technology has an important impact on the cultural and social values of a society. The application of "modern" technology has been criticized as having disrupted unnecessarily these values when more appropriate technologies could have achieved the same economic goals without this disturbance. This lack of flexibility is sometimes attributed to the fact that decision-making powers regarding technological applications have been centralized in the development process, leaving out broad based local participation.[5.14] Since AT is often designed with the specific demands of a locality taken into account, it lends itself to more local influence in both the design and the decision-making processes.[5.15]

C. *How to Incorporate AT into a Development Strategy*

Difficult questions exist with regard to the practical application of AT to the development process. The emphasis of alternative approaches which are advocated by practitioners can vary considerably.

5.13/ See A. de Wilde, "Some Social Criteria for Appropriate Technology," R. J. Congdon (ed.), *Lectures on Socially Appropriate Technology* (Eindhoven, Netherlands: Committee for International Cooperation Activities, Technische Hogeschool, 1975), pp. 192-211; and J. P. Girardier and M. Vergnet, "The Solar Pump and the Problems of Integrated Rural Development," *Appropriate Technology: Problems and Promises*, pp. 253-259.

5.14/ D. Dickson, *The Politics of Alternative Technology* (New York: Universe Books, 1975); G. M. Foster, *Traditional Cultures and the Impact of Technological Change* (New York: Harper & Row, 1973). The importance of considering culture is illustrated in an incident in Java in 1974. Local fishermen destroyed new nylon nets and boats supplied by by government to designated poorer families in their group because it seemed to threaten their established economic relationships and nighttime fishing patterns in part related to religious beliefs. D. K. Emmerson, "Introducing Technology: The Need to Consider Local Culture," *International Development Review*, 19, No. 1 (1977), pp. 17-20.

5.15/ At the extreme, AT has been associated with limits of growth philosophies which gained increased acceptance in the late sixties and early seventies. Western technology was seen as a form of eco-colonialism and the extension of Western materialism—output takes precedence over employment and income distribution, natural resources are depleted without concern for long run ecological effects, people are alienated from a society which allows economic growth to take precedence over humanistic value, etc. Here AT takes on in some cases an almost quasi-religious nature as it is seen as a sort of Buddhist middle way, requiring the scaling down of the wants of the more affluent. See Schumacher, *Small is Beautiful;* G. McRobie and M. Carr, *Mass Production or Production by the Masses: Technology a Critical Choice for Developing Countries* (London: Intermediate Technology Development Appropriate Technologists"; R. J. Congdon (ed.), *Introduction to Appropriate Technology—Toward a Simpler Life-Style* (Emmaus, Pennsylvania: Rodale Press, 1977).

One of the hotly debated issues here is the role of multinational corporations (MNCs) in the cost of technological transfers, the dependency of LDCs on their technology, and the inappropriateness of the factor mix of operations in LDCs which are owned or controlled by MNCs. Regarding the dependency issue, see P. Streeten, "The Multinational Enterprise and the Theory of Development Policy," *World Development*, 1, No. 10 (October, 1973), pp. 1-14; and Pack and Todaro, "Technological Transfer, Labour Absorption, and Economic Development," *Oxford Economic Papers, op. cit.*, the latter who argue that since the LDC market is so small, MNCs have no incentive to develop technologies appropriate for them, so the LDCs must develop their own.

On the relative labor intensity of MNCs and local firms in LDCs, see D. J. C. Forsyth and R. F. Solomon, "Choice of Technology and Nationality of Ownership in Manufacturing in a Developing Country," *Oxford Economic Papers*, 29, No. 2 (July, 1977), pp. 258-282; R. H. Mason, "Some Developing Countries," *Review of Economics and Statistics*, 55, No. 3 (August, 1973), pp. 349-355; and R. B. Helfgott, "Multinational Corporations and Manpower Utilization in Developing Nations," *The Journal of Developing Areas*, 7, No. 2 (January, 1973), pp. 235-246. The heat over this issue is due in part to the fact that the evidence is rather mixed.

For articles on the cost of the transfer, see P. O'Brien, "Developing Countries and the Patent System: An Economic Appraisal," *World Development*, 2, No. 9 (September, 1974), pp. 27-36; E. Penrose, "International Patenting and the Less-Developed Countries," *Economic Journal*, 83, No. 331 (September, 1973), pp. 768-786; and C. V. Vaitsos, "The Revision of the International Patent System: Legal Considerations for a Third World Position," *World Development*, 4, No. 2 (February, 1976), pp. 85-102. For a general defense of the role of the MNC in the transfer of technology, see H. W. Wallender, "Sources of Conflict Associated with the International Transfer of Technology," Third Quadrilateral Businessmen's Conference on Economic Interdependence, October, 1976, London, England.

While the case for AT does not necessarily rest on these more radical positions, it is important to note their place in the development of the AT concept, as a number of AT institutions and some countries involved in the application of AT are heavily tied to a number of such ideas. For a succinct summary of both theoretical and practical problems in the incorporation of AT in the development strategies of several countries, see P. W. Askin, *Intermediate Technology: An Informal Survey* (Washington, D.C.: Department of State, Senior Seminar in Foreign Policy, 1976).

While economic policies distorting factor costs have significantly contributed to inappropriate technologies, the removal of minimum wages, the lowering of employer contributions to social security systems, the increasing of interest rates, etc., are often politically unfeasible in order to foster more appropriate technologies through the market system.[5.16] This is the case to varying degrees in LDCs, although there has been an increasing liberalization regarding capital pricing in some developing countries in the last few years. This problem, however, points up the critical role that small scale enterprises can play in the development and application of AT.[5.17] Small scale firms, especially rural ones, rarely have access to subsidized capital and generally pay wages which are significantly lower than those of the modern sector. Therefore, we should expect to find in at least some small scale enterprises a variety of appropriate technologies. This is supported in this manual by cited studies which show small scale firms being more labor-intensive than large scale businesses (i.e., capital light), yet showing in a number of instances high profitability rates.[5.18] The proposition is also supported by the AT premises that AT is location-specific and best developed where local participants control the decision-making process regarding the type of technology to be used.[5.19] Small scale enterprises adapt the production process to their local market conditions which they best understand, and make their own technological choices, since they are relatively isolated from development planners and the decision-making process of the modern sector which is biased in favor of capital-intensive processes. Thus, the position of this manual is that the survey of firms with profitability and factor mix profiles enables planners to identify firms which apply appropriate technologies. The method permits the identification of firms which are successful and an examination of the type of technologies they employ. By comparing these technologies with those of less profitable firms, appropriate technologies can be identified and spread for the broader dissemination of the potential benefits to be derived.

This is not to suggest that other approaches to the development of AT are inappropriate. It does, however, interject some irony into several basic debates which surround AT. While proponents of AT agree that the concept has application to the modern as well as the traditional sector, the traditional sector is generally targeted for priority

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5.16/ On this point, see H. Pack, "Policies to Encourage the Use of Intermediate Technology," paper prepared for the A.I.D. Committee on Intermediate Technology, April, 1976.

5.17/ The potential of small scale enterprises in utilizing appropriate technology has been pointed out by H. H. Miller, "Some Criteria for Choices of Technology for Developing Countries," R. L. Bulfin and J. R. Greenwell (eds.), *The Application of Technology in Developing Countries* (Tucson: University of Arizona, 1977), pp. 55-68; and S. R. Daines et al., *Guatemala: Rural Enterprises* (Washington, D.C.: Experience, Inc., and USAID, 1978), pp. 78-98.

It has been hypothesized that more labor-intensive techniques require more managerial skills than capital-intensive ones, and such skills are a scarce resource in LDCs, especially among small scale enterprises. It is not clear to what degree this might be counterbalanced by greater skill requirements of capital-intensive processes, such as machine repair abilities, which are also scarce in LDCs. Likewise, it is unclear to what degree the few empirical studies made to date are applicable to the traditional sector. Focus tends to be on more sophisticated processes of products not always produced by the traditional or small scale sector. See C. Clague, "The Determinants of Efficiency in Manufacturing Industries in an Underdeveloped Country," *Economic Development and Cultural Change*, 18, No. 2 (January, 1970), pp. 188-205); and H. Pack, "The Substitution of Labour for Capital in Kenyan Manufacturing," *Economic Journal*, 86, No. 341 (March, 1976), pp. 45-59, who challenges the "engineering man"/"economic man" dichotomy in smaller firms and asserts that foreign educated engineers are very flexible in terms of using older technologies.

5.18/ S[illegible] 4.12.

5.19/ As [illegible] *it.*, pp. 42-43, has given several reasons for the location specific nature of appropriate technology: 1) regional and inter-country differences of a political, economic, social, and cultural nature including differences in resource base, agricultural practices, topography, social conditions, population patterns, infrastructure, level of development, etc.; 2) national and local pride of AT innovators and entrepreneurs resulting in modifications; and 3) government officials justifying their efforts. The author notes that for the purposes of development assistance by A.I.D. and other institutions, the normal forms of project and program assistance are not compatible with the local specific requirements of much AT. This implies for the author that assistance must either take the form of mini-projects involving a greater number and variety of specialists working in the locality of the project, or financing of such work through other institutions involved in this way.

focus because of its employment and income-generating potential for the poor.[5.20] Emphasis on the traditional sector, however, generally focuses on the need to apply capital light technologies which implies the need for "intermediate" technologies—i.e., technologies which are not as primitive as those applied in the traditional sector but which are less complex, large scale, and capital-intensive than the modern sector; a technology between the two extremes. The logical implication and actual result of this interpretation is to focus on new and innovative research to create new technologies which fill this "technological gap."[5.21] A great deal of effort of institutions working on AT is directed toward research for this very purpose.[5.22] The International Rice Research Institute (I.R.R.I.), for example, has devoted a great deal of practical research and development in order to design small scale (capital light) machinery and equipment suitable for small scale agricultural use, such as the 5 to 7 horsepower tiller and the axial flow thresher. Their experience has shown, however, how AT must be implemented as part of an integrated development approach or more unemployment can result from the introduction of such capital light techniques. While such machinery is often designed to alleviate the labor bottleneck which exists at harvest time when there is a peak demand for labor whose supply can constrain added output, the machinery can often be used for other periods or more than compensate for labor shortages at these peak periods. Thus, unless careful planning is carried out to ensure there is land available for new production or new cropping patterns which increase labor demand, unemployment can result.[5.23] This in part points up the important role the survey method of this manual provides in this approach to AT. It provides data which both permit the identification of bottlenecks and assist in integration of the required coordination of efforts.

The application of AT may also play an important role in the development of larger agribusinesses. While a number of modern food processing technologies are already relatively labor-intensive, others are not. It raises the issue of to what degree both processes might not economically substitute more labor for capital than presently through the application of different technologies.[5.24] Commonly, AT literature treating the modern sector in

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5.20/ The question has been frequently investigated as to whether the income distribution in favor of the poor would not generate more employment through their increased demand for labor-intensive products relative to the rich. See W. R. Cline, "Distribution and Development: A Survey of Literature," *Journal of Development Economics*, 1, No. 4 (February, 1975), pp. 359-400; V. E. Tokman, "Distribution of Income, Technology, and Employment: An Analysis of the Industrial Sectors of Ecuador, Peru, and Venezuela," *World Development*, 2, Nos. 10-12 (October-December, 1974), pp. 49-80. D. Morawetz, in "Employment Implications of Industrialisation in Developing Countries: A Survey," *Economic Journal, op. cit.*, pp. 503-507, after pointing out that most studies show the increase in employment to be rather small through income redistribution, suggests that the results might also be the result of methodological deficiencies.

5.21/ It is sometimes debated that even intermediate technologies are too expensive to purchase and too complex to maintain, and simpler technologies are advocated which are more modest adaptations of methods used in poor villages—"village technologies." See G. MacPherson and D. Jackson, "Village Technology for Rural Development: Agricultural Innovation in Tanzania," *International Labour Review*, 3 No. 2 (February, 1975), pp. 97-118

5.22/ For reviews of some of the activities by institutions in this area, see L. J. Goodman, "Appropriate Technology Study: Some Background Concept, Issues, Examples and Recommendations," paper of The East-West Center, Honolulu, Hawaii, April, 1976, *Proceedings of the Conference and Seminar on Techniques and Methodologies for Stimulating Small-Scale Labor-Intensive Industries in Developing Countries, op. cit.*; E. F. Schumacher, "The Work of the Intermediate Technology Group in Africa," *International Labour Review*, 106, No. 1 (July, 1972), pp. 75-92. See also, L. W. Bass, "The Role of Technological Institutes in Industrial Development," *World Development*, 1, No. 10 (October, 1973, pp. 27-32.

5.23/ In the motorized water pump case, R. L. Sansom, "The Motor Pump: A Case Study of Innovation and Development," *op. cit.*, pp. 113-115, the use of the pump replaced labor previously used in other systems of irrigation, but the new ability to raise a second rice crop offset this so that there was not a decrease in labor demand. In an Indonesian case, however, the introduction of a rice huller in rural farms replaced an estimated 125 million woman-days of labor a year with a total wage value of $50 million. Askin, *op. cit.*, p. 125.

5.24/ Some emphasis has been put on "capital stretching" (e.g., running machinery at a faster pace, increasing the number of work shifts per day, purchasing used machinery etc.) by LDCs to increase labor intensity. This was effectively done by Japan and has been tried in a number of LDCs. C. Cooper and R. Kaplinsky, "Secondhand Equipment in Developing Countries: Jute Processing Machinery in Kenya"; A. S. Bhalla (ed.), *Technology and Employment in Industry;* J. C. H. Fei and G. Ranis, "A Model of Growth and Employment in the Open Dualistic Economy: The Cases of Korea and Taiwan," *Journal of Development Studies*, 11, No. 2 (January, 1975), pp. 32-63.

which many larger agribusinesses fit tends to focus on the need to either adapt and modify existing techniques or rediscover techniques which used to be employed in the developed countries when the relative labor/capital costs were more similar to those of the LDCs today.[5.25] This approach has led a number of AT organizations to search for older technologies among small shops in relatively backwards regions of developed countries, believing that this will broaden the technological shelf of information from which the LDCs can draw.[5.26]

While this approach can undoubtedly be fruitful and has proven to be so in a number of cases, the survey method of this manual also offers an important approach for identifying firms already applying appropriate technologies. There are many cases where agribusiness firms have little access to capital subsidies and few ties with institutions and companies which promote "modern" technologies, so they of necessity develop more labor-intensive and capital light technologies. The survey will allow an identification of such firms in the same way as for small scale enterprises, allowing for a dissemination of their technologies to other firms.

While it is not suggested that the approach of this manual be an exclusive one in identifying and developing appropriate technologies, it does have several advantages and should receive far greater comparative emphasis than it has in the past. One benefit of the approach is that it is relatively economical compared to the development of new technologies. Since AT is often location-specific, a machine developed for one region may not be appropriate for another. A machine might be developed which is economical where used on farms of a local region in which the average farm size is 6 hectares, yet be uneconomical for another region where the average farm size is 2 hectares. Where existing technologies are identified within each region, they will have taken into account these very differences of the locations—i.e., they will be location-specific. Equally important is the fact that existing AT presently in use in some small scale firms will have likely taken into account local cultural and social values, so that it is probable that there will be a minimum disruption of such values through the wider dissemination of such techniques. Also, this method permits an analysis of the degree to which the benefits of the technology go to the target group selected for A.I.D. assistance. Finally, the technologies will be those which have emerged out of local participation in the development of the processes themselves. This will not only add to the probable appropriateness of the technology in economic terms, but also reinforce ethnic and national pride, important elements in the development process.

5.25/ It should be noted here that a potentially significant impediment to firms utilizing more labor-intensive processes in LDCs can be the lack of a competitive environment, often created by excessive tariff protection and leading to monopolistic practices. Studies in both Brazil and Pakistan conclude that this, rather than technical factor rigidities, explains the relatively capital-intensive nature of some firms in LDCs. S. A. Morley and G. W. Smith, "Limited Search and the Technological Choices of Multinational Firms in Brazil," *Quarterly Journal of Economics*, 91, No. 2 (May, 1977), pp. 263-287; L. J. White, "Appropriate Technology, X-efficiency, and a Competitive Environment: Some Evidence from Pakistan," *Quarterly Journal of Economics*, 90, No. 4 (November, 1976), pp. 575-589.

5.26/ G Ranis, in "Technology, Employment and Growth: Lessons from the Experience of Japan," *Automation in Developing Countries*, pp 48-49, recounts a case in the late 1920s where a Japanese linoleum machinery purchasing agent went to the United States to obtain machinery for producing printed goods. Because of the differences in labor costs, he decided not to buy the current machinery but hunted out older machinery which had been discarded by one firm which he found and purchased for use in his country.

CHAPTER SIX: ELABORATING A PROFILE OF AN AGRIBUSINESS RURAL ENTERPRISE SYSTEM

A. Introduction

The objective of an agribusiness-rural enterprise profile is to provide an overview of the sector, its structure and general technology level, and to provide a backdrop for rational identification of project opportunities. Very often, project possibilities are identified without a sector overview which could have provided indications that other interventions were possible and perhaps even preferable.

The Country Development Strategy Statement (CDSS) is the appropriate document for the general conclusions of the profile. Project identification can be commenced in a well done profile, which can also be the basis for determining what additional data would be required for further project development. In content, the profile is similar to what A.I.D. has called Sector Assessment and its intent is essentially the same, to provide a broad view of the sector and its problems.

B. Sector Definitions

In order to provide project planners with the necessary detail in the profile, agribusiness and rural enterprises must be broken into component parts which make conceptual sense in A.I.D. terms. These components or subsectors must be defined and delimited. It is likely that the following categories will be useful as characteristics to use in disaggregating the overall sector into useful subgroupings.

1. Product Types

Product class as a way of grouping enterprises has a number of advantages. First, product type distinctions may be reasonable proxies for other more sophisticated distinctions such as labor intensity; i.e., certain product types like bakery goods are likely to be labor intensive in developing countries when compared to other products like edible oils processing. The second advantage is that product types link obviously into different parts of the primary agriculture sector; for example, furniture making links to forestry, fruit and vegetable processing to intensive agriculture, milling and baking to grain production, etc. These links may even have regional implications which will be easier to trace and understand if the profile is grouped by product types.

2. Scale of Operation

Small scale cottage-type industry should be distinguished from medium and large scale enterprises in the profile. Technology differences are perhaps the most important reason, yet other motives support the division.

Small scale enterprises exist in a unique institutional and cultural environment and would require quite distinct project instruments for access. Small scale enterprises are so different from larger enterprises that keeping them distinct in the profile is important. Where to draw the line between the small scale enterprise and the larger more complex enterprise may be difficult in concept, but it will probably prove to be easier in practice because the data available leave little flexibility for the choice. If there are data for small scale enterprises, the data are usually gathered with a predetermined breaking point between the small and large enterprises. It is almost always true that a different survey of data gathering instruments is used for the small scale or cottage industry than for medium and large scale enterprises.

3. *Urban/Rural*

Distinctions between urban and rural enterprises may be critical for A.I.D. purposes because of the peculiar nature of A.I.D. program categories, and additionally because of the A.I.D. focus on the rural poor.

For the purpose of definition in this manual, "rural" includes those enterprises outside of metropolitan areas. Market towns and small cities located in and serving the agricultural sector with strong backward links to small farms and rural poor would be included as "rural."

4. *Agribusiness Classification*

As used in this manual, the terms "Agribusiness," "Agroindustry," and "Agroservices" are all assumed to be included when the term "Agribusiness" is used.

Definitional problems should be clearly spelled out with reference to the intended coverage of the "sector." Each country and each program setting may require or at least imply a different definition. The one described here is only an example chosen to fit many mission situations, not to prescribe a pattern applicable everywhere.

Agribusiness enterprises are here defined as those enterprises which process, elaborate, store or market products of the primary sector to include crops, livestock, forests and fisheries, or provide inputs to the sector.

The reader will notice that the title to this section, indeed the title to the manual as a whole, includes "Agribusiness" and "Rural Enterprises." The use of both of these terms may at first seem redundant, yet on further reflection it should be noted that many small scale rural enterprises are not agribusinesses by the definition used above that they process or market some agricultural product or provide farm supplies. It should also be noted that many agribusinesses are not rural. The intent of the use of both of these terms is to include even those agribusinesses which are not rural (food and fiber processing in urban areas); and to include those small and medium scale rural enterprises which are not agribusinesses (small rural shops marketing hardware or manufacturing domestic nonfood articles). The basic reason for wishing to include urban agribusinesses is their importance as links to the rural poor; they provide the market outlets and modern inputs to increase rural welfare. Agribusinesses of all scales are keys to rural development even though their location may be urban. The intent of including rural small and medium scale enterprises of non-agribusiness nature is their obvious direct link with income and employment of the rural poor, and more particularly the landless, the most impoverished group of rural poor.

5. *Geographical Distinctions*

Regional differences are usually dramatic in developing countries, especially in the larger ones. A.I.D. programs are likely to have strong regional orientations to fit this diversity. The sector profile should likewise preserve regional and geographical groupings to facilitate project planning and to avoid misleading generalizations which result from attempting to interpret data from widely divergent regions.

C. *Topics for the Sector Profile*

1. *Subsector Share in Total Production and Employment*

This topic deals with a general quantitative description of the relative size of the various subsectors defined by product type, by region, by scale, etc. It is important for the project planners to start from a base line of relative size information. An example is given in Table 6-1 of an employment share profile for West Malaysia.

Table 6-1
West Malaysia Rural Employment by Sector, 1970

Subsector	No.	Percent	Subsector	No.	Percent
Agricultural Prod.	392,103	100	**Manufacturing**	52,675	100
Rubber	339,943	86	Food	9,093	17
Oil Palm	22,741	6	Beverages	502	1
Vegetable Oils	23,467	6	Tobacco	1,531	3
Tea	1,530	4	Textiles & Shoes	2,021	4
Coffee	2,410	6	Other Clothing	2,143	4
Estate Labor Contr.	2,012	5	Wood & Cork Prod.	14,594	28
Commercial Ent.	62,433	100	Furniture	1,614	3
Commercial Ent.	62,433	100	Paper & Prod.	490	1
Wholesale	5,941	10	Leather & Rubber	1,700	3
Retail	51,154	82	Other Manufacturing	18,987	36
Other Commerce	5,338	8	(Non-Agroindustrial)		

Source: **Preliminary Worksheets from Malaysian Population Census 1970.** Quoted from: **Development Issues in Rural Non-Farm Employment** (Washington, D.C.: Development Economics Department, IBRD, 1977), 42 p. + Annexes, Statistical Annex, p. 13.

The information contained in a simple employment or production share profile is basic to any rural enterprise planning process. In order to illustrate how other groupings of subsectors can be useful as discussed in the "definitions" section above, similar employment share data for Sierra Leone by Chuta and Liedholm are shown in Table 6-2 using urban/rural groupings. It should be noted that this simple process could be followed for regional and scale groupings as well.

Other subtopics which might be considered under the general heading of "subsectoral shares" might be the percentage share of each subsector (product type, scale, region) in total production, export earnings and GNP. An example of a GNP share table is illustrated in Table 6-3 for Jamaica. Table 6-3 illustrates a product type grouping which is considerably more detailed for agroindustries than the one used in Malaysia. More detailed subgroupings may assist project planners in searching and assessing specific project alternatives.

Table 6-2
Employment Share Profile of Rural Enterprises in Sierra Leone

	Rural Areas Employment		Population Centers 2,000-5,000		Population Over 100,000 Employment	
	(No.)	(%)	(No.)	(%)	(No.)	(%)
Food						
Baking	3,000	(4.4)	206	(5.4)	164	(3.3)
Textiles & Wearing Apparel						
Spinning & Weaving	6,000	(8.8)	126	(3.3)	0	(0.0)
Gara Dyeing[c]	9,000	(13.2)	380	(10.0)	24	(0.5)
Tailoring	20,000	(29.4)	1,508	(39.9)	2,380	(48.5)
Shoemaking & Repair	1,000	(1.5)	18	(0.5)	131	(2.7)
Wood						
Carving	1,500	(2.2)	76	(2.0)	14	(0.3)
Carpentry	11,500	(17.0)	666	(17.6)	345	(7.0)
Metal						
Goldsmithing	2,500	(3.7)	32	(0.8)	54	(1.1)
Blacksmithing	11,500	(17.0)	180	(4.8)	37	(0.8)
Welding & Fitting	0	(0.0)	20	(0.5)	86	(1.8)
Repair Services						
Radio	0	(0.0)	12	(0.3)	61	(1.2)
Vehicle	0	(0.0)	98	(2.6)	578	(11.8)
Watch	0	(0.0)	16	(0.4)	76	(1.6)
Others[d]	2,000	(2.9)	446	(11.8)	963	(19.6)
Total	68,000	(100)	3,784	(100)	4,903	(100)

Source: Enyinna Chuta & Carl Liedholm, "The Role of Small Scale Industry in Employment Generation and Rural Development: Initial Research Results from Sierra Leone," African Rural Employment Paper No. 11 (Department of Agricultural Economics, Michigan State University, East Lansing, 1975.

[a]Population centers from 5,000-100,000 omitted.

[b]Preliminary estimates.

[c]Gara is a local cloth.

[d]Though none are listed for rural areas, the "other" items include watch repair and bicycle repair, as well as hammock making and basket making.

2. *Institutional Profile*

The profile should contain a description of the major institutions which provide services to agribusinesses and small and medium scale rural enterprises. The institutional profile should deal with such issues as the volumes of credit for each of the subsectors (product type, scale and regions) by institutional source. Technical assistance provisions should be outlined. The role of industrial associations, cooperatives, craft and trade organizations, etc., should be discussed and their relative contributions to various financial and technical services estimated. The institutional profile will often be the least quantified, yet among the most important section of a profile, for it is at this point that limits on the ability of A.I.D. to intervene will begin to surface and areas of need will begin to take shape.

Table 6-3
Value Added for Agroindustries with 10 or More Workers, Jamaica, 1976

	J$ '000	Percentage of All Value Added in Manufacturing
Meat	$ 33,533	3.3
Dairy Products	48,356	4.8
Edible Oils & Fats	21,428	2.1
Bakery Products	61,019	5.4
Sugar, Molasses	104,984	10.4
Drinks	80,239	8.0
Animal Feeds	40,087	4.0
Tobacco Products	58,641	5.8
Textiles	13,156	1.3
Clothing	27,522	2.7
Footwear	13,769	1.4
Canning & Preserving Fruits & Vegetables	17,531	1.7
Grain Mill Products	27,512	2.7
Wood, Wood Products & Furniture	17,633	1.8
All Other Food & Drink	27,326	2.7
	592,736	58.1

Share of Value Added of Manufacturing by Detailed Food Processing Subsectors

	J$ '000	%
Poultry Meat	25,176	2.51
Ham	2,592	0.26
Bacon	2,195	0.22
Sausages/Frankfurters/Bologna	1,370	0.14
Condensed Milk	22,869	2.28
Ice Cream	4,118	0.41
Preserving of Fish	2,132	0.21
Edible Oil	14,695	1.46
Edible Fats	6,733	0.67
Flour	16,647	1.66
Bread	24,375	2.43
Bun & Cake	14,985	1.49
Cornmeal	5,012	0.50
Sugar	97,986	9.75
Molasses	5,227	0.52
Rum	7,637	0.76
Alcohol, Including Gin	1,771	0.18
Beer & Stout	51,575	5.13
Aerated Waters	19,256	1.92
Poultry Feed	25,365	2.52
Pig Feed	10,863	1.08
Cattle Feed	3,331	0.33
Cigarettes	54,522	5.42
Cigars	4,119	0.41
	$424,551	42.26

Source: Jamaica Department of Statistics, **Production Statistics**, 1977.

3. *Employment Potential and Labor Intensity*

The profile should contain an assessment of employment potential of the sector and its subcomponents. The cost of generating additional employment is a vital issue to which a profile can direct its attention by presenting an outline of the labor intensity of each subgrouping. With this information, project planners can assess the relative potential of different product types, scales, and regions

Table 6-4 presents examples of employment costs in terms of capital costs per employee for India and El Salvador.

Table 6-4
Capital Costs of Employment for India (1965) and El Salvador (1970)

Subsector	India (Rupees) 000 RS/Employee			Subsector	El Salvador US $
	Small	Medium	Large		Medium & Large
Grain Mills	2.1	8.4	11.7	Fishing	$ 4,700
Misc Food	2.1	5.9	8.5	Food Processing	1,720
Tobacco	0.3	1.1	3.4	Coffee & Misc.	20,072
Textiles	1.3	2.8	3.8	Drinks	4,852
Wood Products	1.5	4.4	5.3	Tobacco	2,288
Fertilizer	4.3	8.2	41.4	Textiles	9,145
				Clothing Manuf.	768
				Shoes & Leather	1,920
				Wood Products	1,004

Sources: India, Annual Survey of Industries, 1965; El Salvador, Industrial Census, 1971.

For a discussion of the data required to compute these labor intensity figures see Part III (Data for Enterprise Analysis), and for methodology see Chapters 7-8 (Methods for Analysis).

4. *Profitability*

Profitability is an important concept because it relates to the financial feasibility of expansion or indeed starting up an enterprise. It contains information on the efficiency of technological and managerial processes, the market demand for products, and the necessity for technical and managerial assistance. A profile of profitability provides the project planner with a rather broad understanding of many factors at once. It is particularly important to utilize all of the groupings mentioned in the "definitions" discussion. Product type, scale, and regional distinctions in profitability profiles will illuminate important project design issues.

Tables 6-5 and 6-6 present profitability profiles as examples of two subsector groupings, by scale (Brazil) and by specific product types (El Salvador).

The combination of profitability and labor intensity findings in Table 6-6 indicate how the topics in a profile may be interrelated. For example, in El Salvador, subsectors using the most labor (highest labor intensity) were also the most profitable (39.4% return), while those with the lowest labor (highest capital intensity) had the lowest profitability (20.1%). Simple comparisons like this in the profile can suggest important project directions.

Table 6-5
Profitability by Scale and Sector in Brazil, 1970

Sector	1-4	10-19	70-99	150-249	500-999
	Net Income/Fixed + Working Capital in Percentages				
Food Products	26%	19%	17%	25%	23%
Clothing & Shoes	21	10	24	27	33
Textiles	27	19	23	25	31

Source: Based on 1970 **Censo Industrial**, Fundacao Instituto Brasileiro de Geografia Estatistica; quoted from S. Daines, **Analysis of Industrial Structure, Technology, and Productivity in the Food Processing Sector of Brazil** (Cambridge, Massachusetts: Massachusetts Institute of Technology, 1975), p. 96.

Table 6-5
El Salvador Profile of Profitability in Agroindustries

Subsector	Net Return to Capital (%)	Net Return to Capital (Manuf. = 100)	Labor Intensity Category
Coffee	0.1	0	Median
Drinks	12.9	0	Low
Tobacco	67.1	851	Median
Textiles	75.4	945	Median
Clothing	13.1	165	High
Shoes	19.3	242	High
Wood Products	9.2	115	High
Furniture	2.8	34	High
Agroindustry	34.7	435	High (Ave.)
Detailed Food Processing			
Meat Products	34.5	432	Median
Milk Products	26.4	331	Median
Fruits & Vegetables	58.5	733	High
Fish Products	41.9	525	Median
Edible Oils	17.7	222	Low
Flour Milling	22.4	280	Low
Bakery Products	32.2	404	High
Sugar/Panela	48.4	606	High
Candy Products	18.3	229	High
Food Ave.	35.1	440	High (All Food)
High Labor	39.4	493	High (Ave.)
Median Labor	34.2	429	Median (Ave.)
Low Labor	20.1	251	Low (Ave.)

Source: S. Daines & D. Steen, **El Salvador Agroindustrial Profile** (San Salvador: A.I.D., 1977), 69 p., p. 16 (based on data in 1971 Industrial Census).

Most often data inavailability, as is explained below in Section D, prevents computation of profitability and capital productivity measurements must be substructured.

5. *Capital Productivity*

In almost all developing country situations, capital is the scarcest of resources, and therefore the output per unit of capital is perhaps the best single indicator of "efficiency." While capital productivity may be a good

indicator of societal efficiency, it does not indicate financial feasibility or bankability. A profile of the capital productivity of each of the subsectors by product type, region and scale provides insights into the advisability from an efficiency point of view of public investment in expanding individual enterprise types. Table 6-7 presents a sample productivity profile by scale and selected subsectors for India 1965.[6.1]

Table 6-7
Profile of Capital Productivity in Selected Agroindustries in India, 1965

Subsector	Small Scale	Medium Scale	Large Scale
	Value of Output/Value of Capital		
Grain Mill Products	1.19	0.55	0.67
Misc. Food Products	1.09	0.70	1.03
Tobacco	4.17	1.27	4.76
Textiles	1.85	0.93	0.92
Wood Products	1.22	0.74	0.22
Clothing & Textiles Art	0.64	0.56	0.32
Fertilizers	1.15	0.97	0.24

Source: Annual Survey of Industries, 1965, India, quoted from **Employment Creation and Small Scale Enterprise Development** (Washington, D.C.: IBRD, 1977), 47 p. + Annexes, annex 1, page 10.

6. *Labor Productivity*

Using labor productivity figures as a guide to project choice is very difficult in developing countries due to the prevalence of unemployment. Labor is not the scarcest factor and labor saving technologies (that usually also have high output/labor ratios) are not therefore the most efficient. It may nonetheless be useful to profile the labor productivity of the industries in question.[6.2]

6.1/ For the purposes of its valuation, capital is often divided into four categories: working capital, equipment, buildings and land, and human capital. While attempts are sometimes made to estimate the last, it is frequently omitted. See, for example, S. Hirsch, "The Product Cycle Model of International Trade—A Multi-Country Cross Section Analysis," *Oxford Bulletin of Economics and Statistics*, 37, No. 4 (November, 1975), pp. 305-317.

For comparative analysis, capital is commonly valued in two alternative ways. One method is to take the gross value of capital at the time of purchase, the capital stock. This measurement suffers from the fact that depreciation rates will vary among industries, as will the extent of obsolence of existing equipment. Also, in an inflationary economy especially, the replacement rate of capital can be significantly different from its original value at the time of purchase. This is sometimes remedied by using replacement values where available. Additionally, since many small scale enterprises rent, rather than own, their buildings and land, the value of these items will frequently be omitted from the value of the capital stock for comparisons in this area.

An alternative approach is to value capital as that amount which is used up in the production process, the capital service. Under this method, the capital stock is frequently discounted to take into account depreciation and the opportunity cost of capital. This method likewise is imperfect, since it generally assumes that the rental price of capital and the rate of depreciation are the same in each industry compared.

Taking the capital service value as a percentage of capital stock where both were calculated for a number of subsectors (Liedholm and Chuta, *op. cit.*), we find that the range of the resulting percentages is between 19.8% and 25.7%, a somewhat limited range. Given the limitations of each method, it is not clear that one method is decidedly preferable over the other in practice, although the second is more theoretically appealing. The method selected will generally be determined by the availability of data in addition to time and financial constraints.

6.2/ It might be pointed out that in some cases labor intensive processes have yielded lower output/capital ratios than less labor-intensive techniques. A. S. Bhalla, "Choosing Techniques: Handpounding v. Machine Milling of Rice: An Indian Case," *Oxford Economic Papers*, 17, No. 1 (March, 1965), pp. 147-157.

7. *Income*

Since increasing incomes of poor households is the principal aim of most rural enterprise interventions, the profile of income generation is perhaps the most important. The income profile also assists to lay the basis for the selection of a project target group by indicating the types of enterprise households that fit A.I.D.'s rural poor definitions. Table 6-8 illustrates an income profile by product type and scale.[6.3] In this example, the incomes for medium and large scale enterprises include only incomes to workers; incomes to stockholders and owners are not included since they are assumed to be outside the potential target group. For small scale enterprises (with less than 5 workers), all owner/worker incomes are included.

Table 6-8
Income Profile by Scale and Product Type in El Salvador
Net Income per Capita Impacts of Agroindustry by Scale

Subsector	Net Income per Capita Medium & Large Scale (US$)	Net Income per Capita Small Scale (US$)
Food Proc.	$147	$229
Coffee Proc.	271	215
Drinks	412	288
Tobacco	189	89
Textiles	221	144
Clothing	156	175
Leather	300	232
Shoes	192	323
Wood Products	122	175
Furniture	222	230
All Agroindustry	Agroindustry $212	$190

Source: S. Daines & D. Steen, **El Salvador Agroindustrial Profile** (San Salvador: A.I.D., 1977), 69 p. page 26.

8. *Agribusiness Linkages*

One of the principal interests in agribusinesses and small scale rural enterprises is the indirect effect these activities have on small farm agriculture in stimulating demand for agriculture products and providing institutional linkages for increasing farm production. A profile should contain information on this backward linkage. Different product types draw more heavily on agricultural production and more importantly on small farmer production.

6.3/ A common characteristic relevant to income and agroindustrial linkages (the next section) is the fact that small scale enterprises are often a secondary yet significant source of income for farm workers. It has been found that there is a good deal of nonfarm employment by landless farm workers during periods of slack demand for farm labor (i.e., nonharvest periods). D. W. Norman, "Economic Analysis of Agricultural Production and Labour Utilization Among the Hausa in the North of Nigeria," African Rural Employment Paper No. 4, East Lansing, Michigan State University, January, 1973.

A study of Taiwan and Korea also suggested that offfarm employment has contributed to a broader income distribution pattern in the rural areas of those countries. As might be expected, it was found that the importance of nonfarm income was in inverse relation to farm size. Interestingly, nonfarm income was more important in Taiwan than Korea because the more scattered population pattern of Taiwan stimulated small enterprises in rural areas, whereas the population concentration of Korea in a few cities prevented the establishment of small firms in rural areas, lessening the nonfarm employment opportunities of the rural poor. See R. L. Meyer et al., "Off-Farm Employment and Income of Rural Households: The Case of Taiwan and Korea," Economics and Sociology Occasional Paper No. 492, Ohio State University, Columbus, Ohio, April, 1978.

Table 6-9 illustrates some sample profiles of backward linkage which would be useful to project planners in attempting to assess the indirect impact potential of alternative investments in agribusiness and small scale rural enterprises.

Table 6-9
Agroindustrial Impact on Small Farm Production

Subsector	Raw Material Intensity (Farm Product as a % Value of Production)	Percent of Output Captured by Small Farmers
Coffee Processing	56.9	6.0
Drinks	14.8	0.0
Tobacco	21.1	8.2
Textiles	44.7	2.8
Clothing	50.1	3.2
Leather	51.7	14.2
Shoes	41.3	11.2
Furniture	36.7	11.2
Detailed Food Industry		
Meat Products	72.0	19.7
Milk Products	54.1	14.8
Fruit & Vegetable	27.6	8.2
Edible Oils	61.7	2.2[a]
Flour Milling	66.9	3.3[a]
Baking	47.2	2.2[a]
Sugar/Panela	50.5	7.7
Candy Products	38.4	5.8

Source: S. Daines & D. Steen, **El Salvador Agroindustrial Profile** (San Salvador: A.I.D., 1977), 69 p., page 264.
[a]Mostly imported goods with little domestic production linkage.

Many alternative modes of computation may be used; any will serve reasonably well to illustrate the linkage between the enterprise sector and small farm production.

9. Growth Trends and Product Demand

Where statistics permit, an overtime trend should be profiled in the growth patterns of output by sector. While demand and growth rate estimates are useful in the sector profile, they are much more important in the project identification and constraint analysis of Chapter 7, which follows. Examples and a fuller discussion are given there.[6.4]

10. Role of Women in Agribusiness and Rural Enterprises

In most developing countries, rural enterprises employ large numbers of women in worker and manager roles. Rural enterprises have the potential of being the most important avenue for improving the status and welfare

6.4/ The issue has been raised as to whether or not there is sufficient demand for small scale enterprises to increase their output. See S. Hymer and S. Resnick, "A Model of an Agrarian Economy with Nonagricultural Activities," *American Economic Review*, 59, No. 4 (September, 1969), pp. 493-506. It has been estimated that in Sierra Leone, at least, rural expenditure elasticities of demand for the products of small-scale industries are sufficiently high to expect "moderate potential for growth through increased demand." See R. P. King and D. Byerlee, "Income Distribution, Consumption Patterns and Consumption Linkages in Rural Sierra Leone," African Rural Economy Paper No. 16, East Lansing, Michigan State University, 1977.

of rural women and it is important therefore that the profile include information on the nature and magnitudes of their role. Table 6-10 illustrates one possible profile by scale and sector of employment share of women.

Table 6-10
Ghana: Women's Share in Employment in Small and Large Scale Manufacturing, 1970 (percentages)

ISIC and	CODE Industry	Share of Total Workers			Share of Sector	
		Large-Scale	Small-Scale[a]	Women	Large Scale	Small-Scale
311	Food	3.4	96.6	85 8	7.5	37.3
313	Beverages	7 9	92.1	57 0	5.1	10.3
314	Tobacco	96.2	3 8	13.9	2 2	0.0
321	Textiles	41.5	58 5	14 6	20.1	4.9
322	Wearing Apparel	3.7	96.3	64 5	6.3	28.1
323 324	Leather Products, Footwear (Including Repairs)					
332	Furniture	6.9	93 0	2 2	3.0	7.0
Total, All Industries		14 1[b]	85 9	54.0	100.0	100.0

Source: W. F. Steel, **Small-Scale Employment and Production in Developing Countries, Evidence from Ghana** (New York: Praeger, 1977), p 190.

[a]Small-scale employment is calculated as a residual (100 percent minus large-scale)

[b]Discrepancy compared with 13 9 percent reported in Table 3 1 is due to the different source of the manufacturing labor force data.

D. Data for an Agribusiness and Rural Enterprise Sector Profile

1. Existing Data vs. Original Data Generation

An agribusiness and rural enterprise profile is best used as a prelude to more specific project identification and project analysis In this role it is important that the profile not take an excessively long time or compete with vital resources needed for the project analysis process itself. These two factors imply that a profile should be based on existing data sources; to field special surveys to provide the data required would take unwarranted time and resources and compete with the target group and project analysis which normally follow a sector profile.

Existing data may not appear to be available in many cases, yet careful search of host government ministries, trade and industrial organization files, lending institution records, and census information will usually provide information to complete most of the above mentioned topics. Often data are not readily apparent because they are in primary form and have not been processed in the form necessary to complete a profile. It is usually possible within the time and resource limitations imposed by the A.I.D. programming cycle to process and analyze primary data from census, ministry or credit entity files What is not usually possible or advisable is to generate special surveys or primary data collection efforts to generate the information simply for the purpose of a profile.

2. *Data Sources*

a Industrial Census Files

Most developing countries conduct periodic industrial and commercial censuses. In the recent decade, the influence of the United Nations statistical assistance effort has been substantial. The formats recommended by the UN are excellent from the point of view of providing data for a rural enterprise profile. Almost all of the topics mentioned above can be completed where a UN-type industrial census has been conducted. Considerable reprocessing of these files may be necessary to cast the census data in the form necessary to complete a profile, but even if the original census questionnaires must be reprocessed, the task is a manageable one. Profiles based on census files have been completed for A.I.D. in at least five developing countries, and profiles should be possible for at least half of the developing country situations.

b Existing Surveys

As a part of the UN statistical program, countries are encouraged to update their census activities with interim samples which cover only a small proportion of the enterprises. Individual ministries and in some cases universities or trade/industrial organizations may conduct surveys. These sources are generally more detailed and consequently more useful than census data for constructing a profile. Unfortunately, these surveys often cover only a limited geographical or limited product types, and may prove incapable of a sector-wide profile.

c. Institutional Files and Records

Credit institutions, industrial associations and other organizations may gather data in their normal course of business which may be drawn upon to support a profile. Only careful review of the files themselves will reveal the existence of such sources. It is extremely difficult to articulate the data needs of a profile in such a way that officials in charge of institutional files can determine whether their data fit the description. It is much more efficient to proceed by making a complete inventory of all data collected by the institution in the course of their activity and then determine independently if their data are suitable for the profile. Confidentiality is usually not a problem if the sensitive part of the information is never allowed to leave the institution. For example, if enterprise files are kept by a credit institution which are useful for a profile, names, addresses, and cash flow information on each enterprise should be masked when forms are xeroxed. Alternatively, nonsensitive data may be copied onto coding sheets under contract by personnel of the institution itself. In these ways, confidential information is never obtained, and the issue of maintaining its confidentiality does not actually present itself.

E. Analytical Methods for an Agroindustrial & Rural Enterprise Profit

Analytical methods for a profile should be limited to simple statistical comparisons and accounting methods. Profitability and productivity ratios represent the most difficult methods feasible, given the time and resource limitations of most profile efforts. Since the methodologies for enterprise accounting, profitability, and productivity analysis are the same for profile and more detailed project analysis, these methods will be discussed in Chapter 8.

CHAPTER SEVEN: PROJECT IDENTIFICATION, TARGET GROUP SELECTION, AND PRELIMINARY CONSTRAINTS ANALYSIS

A. Project Identification and Constraint Analysis

1. Stages in Project Identification

A.I.D. has outlined an orderly process of project identification which begins with the CDSS document. This process leads in a relatively systematic fashion from general five year A.I.D. strategy to the identification of particular projects. The extract which follows is from the guidance cable (AIDTO CIRC A-384) sent to the A.I.D. missions on September 16, 1978, explaining the CDSS and project identification procedures.

> The CDSS will be the basic analytical strategy and planning document of AID for individual countries. It will, (1) serve the Mission as the conceptual framework for developing programs, projects and budgets, (2) be the basic reference document in AID/W for overall program review for the country, (3) serve as the major reference point by AID/W project reviewers, (4) show, in quantitative and qualitative terms, what AID expects to achieve in a country and how AID intends to do it. Thus, the CDSS will provide the standard against which effectiveness can be measured.
>
> The CDSS will be a part of an annual programming cycle which starts with the determination by AID/W of Indicative Planning Allocations for each country.
>
> In treating the development problems the Mission should address these things: Identify the specific areas in which assistance is proposed, i.e., functional areas or sectors, geographic areas, rural, urban, etc, and subdivisions of these categories as appropriate. <u>It should be possible here to identify sub-sectors or problem areas for AID assistance without getting to the actual project level.</u> Indicate the kinds of changes that the AID program will attempt to bring about including not only policy, institutional and asset distribution changes but also such things as the need for new technical production packages, development of new export crops, changes in curricula, etc. Relate these proposed changes to specific assistance objectives set forth above. The overall objectives must have a significant and identifiable effect on the country's development and be consonant with AID's policy interests.

The development of the CDSS and supporting sector assessments and profiles is an important part of identifying projects which will address the overall needs of the poor. Moving from an overall AID country strategy (CDSS) to analyses of particular sectors (Agribusiness and Rural Enterprise Sector Assessment or Profile) and then to individual project identification (PID) allows for an orderly review of information at increasing levels of specificity and reduces the probability that projects are identified simply because some AID or Host Country official has a particular project in mind.

2. *A General Format for Examining and Ranking Constraints*

a. *Constraints and Sub-sectors in a Tabular Format*

The diversity of the agribusiness and rural enterprise sector must be kept in mind when proceeding to examine apparent constraints which limit welfare of poor families. Factors which constrain in large scale food processing industries would not likely be the same as those factors limiting small scale rural tailoring shops. The lack of data and detail in the sector profile imply that much of this complexity will be unseen in the preliminary constraints analysis and must be left to the later more complete examination of constraints during the preparation of the project paper. In order to maintain some semblance of attention to the diverse situation of the various subsectors or groupings (different scales, product types, and regions), the tabular format illustrated in Table 7-1 is suggested. The listing of constraints is discussed in section 3 below where each of the constraint types is examined and a method of using sector profile data to assign a ranking is outlined.

Table 7-1
Tabular Format for Preliminary Constraint
Ranking Based on Sector Profile
Data and Expert Judgment

			Resource Use Constraints								Resource Availability Constraint					
			Resource Use Efficiency Constraints				Price Constraints				Resource Constraints				Marketing System Constraints	
	No. of Families		Process Technology	Management	Product Mix	Tech. Training	Input Prices									
Region I																
Small Scale Product Type a Product Type b Product Type c ..... Product Type n																
Med. & Large Scale Product Type a ..... Product Type n																
Region II																
Small Scale Product Type a Product Type b ..... Product Type n																
Region N																

Constraints limit expansion or improvement in an enterprise. In order to understand the idea of constraints as used in the tabular format, and in later project analysis discussion, it may help to explore the types of expansions or improvements an entrepreneur could make. Each possible improvement or expansion suggests corresponding factors which are limiting.

A rural or agroindustrial enterprise entrepreneur may increase his income in two basic ways:

1. by increasing the resources he utilizes, or
2. by changing the way resources are used

He may increase the size of his operation by acquiring added resources, or he may increase the efficiency with which the resources he has are used Of course both basic changes may be made at the same time. These two basic alternatives at the enterprise level for increasing income provide a useful way of organizing the analysis of constraints.

Constraints may be grouped into those factors which limit the efficiency with which the enterprise utilizes resources (resource use constraints) and those factors or conditions which limit the quantity of resources the enterprise has available to it. It should be noted that all of these constraints are firm level constraints and that no assertion is implied as to final or principal cause in the economy as a whole There are secondary and tertiary institutional, cultural, political and other constraints which cause or influence these enterprise constraints. These institutional or secondary constraints must be identified before A I D projects can be adequately designed Even though these secondary constraints exist, it is useful to begin by examining the alternatives and constraints at the firm level in order to make more orderly and accurate the process of examining contributory or causitive factors at public or institutional levels. An example of this constraint "chain" might be liquidity. Assume that the data indicated that small scale enterprises were profitable and could expand if they had additional liquidity. Credit would be identified as a firm level constraint A wide variety of secondary causitive or contributory constraints might then be identified. It may be that government policy restricts credit entities from recovering the added costs of making small scale enterprise loans by charging higher interest rates or fees This might be a policy constraint. At the stage of the tabular format suggested in Table 4-1, no assertion is made as to ultimate cause, only factors which limit the enterprise itself

While the organization of constraints as described above may assist in clarifying the process of determining what factors are limiting increased welfare in the rural enterprise sector, the utility of the format does not depend on the appropriateness of this particular classification of constraint types. Each analyst may have his own perspective on how to organize and classify the factors which limit the improvement of welfare in target enterprises. All that is necessary for the cross tabular format to be useful is that the analyst has a list of these factors, and that he recognize that they are not equally limiting or important for all regions, scales, and product type enterprises. The analyst should simply substitute his list for the constraint column headings in Table 7-1 and proceed to assign a priority to each constraint type for the major enterprise groups considered.

b. Preliminary Ranking of Constraint Priorities

The hope of the project designer is that some factors or limiting conditions are more important than others, since the assumption of a project is that altering some elements in the environment will cause a positive change. If all elements or factors are simultaneously and equally binding and all must be attacked equally at once for any improvement to result, then the very hypothesis of A.I.D. projects as feasible instruments of change must be

rejected since they cannot hope ever to effect all of these factors at once. The process of assigning priorities to the constraints may take place explicitly in some tabular format or implicitly in the minds of project planners. Using a record keeping system like the tabular format has three advantages:

1. Others can follow the process which led to the selection of particular project activities.
2. The contribution of evidence from the sector profile in the identification and prioritization of constraints is facilitated
3. Expert judgments may be explicitly compared with the sketchy quantitative evidence.

At the project identification stage only the roughest level of precision is expected from this exercise. It may be useful to submit a blank table like Table 4-1 to each of the host country and A.I.D. officials concerned with the identification of the project, and then compare the first cut results with the evidence drawn from the profile. In some cases one might conclude that the limited statistical evidence and the expert judgments are leading in identical directions. In others there may be conflicts and inconsistencies between the profile and the expert opinion, or perhaps even differences between different experts. At least the tabular format provides a way to keep track of these inconsistencies and for adding up the implication of whatever consensuses surface. If there is sufficient agreement on what the problem is (what is constraining improvement), there is ample reason to proceed to decide what to do about it. If no consensus exists on even the roughest outline of what the problem is, agreement on how to solve it is meaningless. Project identification should not be overburdened with pressure for certainty, evidence, or clarity, and there is little danger that such pressure would be excessive given the counterbalancing encouragements implied by the short fused A.I.D. programming cycle. Project identification has been properly viewed as a stage for raising reasonable hypotheses for confirmation during the project approval process. It is unfortunate, however, that few PIDs even state the underlying hypotheses about the problems or constraints which are to be attacked, and these hypotheses are seldom directly tested in the information contained in the project paper. Discussion in both PIDs and PPs passes so quickly to treat the problem of the institutional process by which the solution is to be administered, that no testable hypotheses about the problem at the firm level, and the chain which leads the planned intervention to connect with the problem are stated. Without stated hypotheses about the problem at the firm level and connecting hypotheses about the way the project hopes to change the firm level problem, it is impossible to design a rational evaluation or monitoring system.

Assigning priorities, however tentative, to the constraints indicated in the cross tabular format is an effective way of structuring project identification and of stating project hypotheses.

An example of how this process may function can be seen in Table 7-2. This example is drawn from the Chile agriculture sector assessment and deals with small farms, not agroindustrial and rural enterprises, and while the constraints are different the methodology is applicable.

The numbers in the columns indicate the priority which project planners assigned to each constraint for each separate target group of farmers. Secondary level constraints were assigned priorities beginning at 1 to indicate their connection with farm level constraints.

c. *A Typology of Constraints at the Enterprise Level*

No attempt in this section is made to exclude the wide variety of other typologies which may be developed to classify the constraining factors which limit the improvement of income to rural enterprise families. The class-

Table 7-2
Chile Sector Assessment
Summary of Constraint Priorities for the Rural Target Group

	Number of Families	Farm Level Constraints				Secondary Level Constraints							
		Land & Water	Land Use	Crop Mix	Yields	Credit	Agro Indust.	Market-ing	Ag. Prices	Export	Institutional Constraints		
											Res. & Exten.	Irrig. & Nat. Res.	Trained Man-power
Arid North Total	23,000	-	-	-	-	-	-	-	-	-	3	-	-
Minifundistas	8,000	1	-	-	2	2	4	5	-	-	3	1	-
INDAP	2,000	1	-	-	2	2	4	5	-	-	3	1	-
Non-INDAP target	6,000	1	-	-	2	2	4	5	-	-	3	1	-
Reform	5,000	1	-	-	2	2	4	5	-	-	3	1	-
Landless Rural	10,000	1	-	-	-	-	1	-	-	-	-	-	-
Central Irrigated	189,000												
Minifundistas	114,000	-	-	-	-	-	-	-	-	-	-	-	0
INDAP	15,000	-	-	1	2	1	2	5	-	3	4	-	-
Non-INDAP Coast	21,000	2	-	1	3	1	3	5	-	4	6	2	-
Non-INDAP Central Valley	79,000	-	-	1	2	1	2	5	-	3	4	-	-
Reform	35,000	-	2	1	3	1	2	5	-	3	4	-	-
Landless Rural Poor	40,000	-	-	-	-	-	-	-	-	-	-	-	-
Ag. Solution	15,000	-	-	1	-	1	2	-	-	3	-	-	-
Non Ag. Solution	25,000	-	-	-	-	-	1	2	-	-	-	-	-
Central South	110,000												
Minifundistas	57,000	-	-	-	-	-	-	-	-	-	-	-	-
INDAP	43,000	-	1	2	3	1	2	5	-	3	4	-	-
Other	14,000	-	1	2	3	1	2	5	-	3	4	-	-
Reform	19,000	-	1	2	3	1	2	5	-	3	4	-	-
Landless Rural Poor	34,000	-	.	-	-	-	2	5	-	3	4	-	-
Ag. Solution	17,000	-	1	2	-	1	2	5	-	3	4	-	-
Non Ag. Solution	17,000	-	-	-	-	-	1	2	-	-	-	-	0

Note: Not included in the above is the important area of producer organizations, the lack of which is not really an important constraint as such because many exist. However, the effecting of many of the above secondary constraints will require the improvement in the producer organization area. Similarly the important question of GOC budgetary is all pervading and therefore not included.

SOURCE: AID, Chile Agriculture Sector Assessment, Agency for International Development, Washington, D.C., 1976.

ification which follows is acceptable and serves the double purpose in this document of suggesting a scheme where an analyst may not have a better one, and provides a basis for discussing the analytical process of connecting the statistics in a sector profile with constraints analysis and project selection.

The discussion which follows presents a paragraph directed at explaining the constraint concept and then a paragraph illustrating how sector profile data could be used to assign each consrraint a preliminary priority. It should be remembered that expert judgment should be used to supplement and adjust profile findings and may substitute for such findings in the absence of any available data.

d. Resource Use Constraints

Resource use constraints are those factors which limit income improvement by limiting the efficiency with which resources are utilized in the enterprise. Two general classes of "use" constraints are defined—those which relate to how resources are combined in the production process, and those which relate to the prices paid for outputs and inputs.

i. Production Process Technology Constraints

Concept. An entrepreneur could increase his income if he could use a more efficient process technology.[7.1] If such a change is feasible, and if his current technology is very inefficient, then this constraint should be given a high priority.

Data. A source of evidence may be looked for in the sector profile which bears on this constraint. If profitability varies widely with scale, and if larger firms have significantly higher profitability rates, one would suspect that perhaps more inefficient technologies at the process level could be a major constraint. It should be noted that most engineers simply assume without examination that production process technology is obviously the most important constraint.[7.2] Without the more detailed type of enterprise accounting data generated for later project analysis, it is impossible to distinguish this constraint from other "resource use" constraints with the use of profitability ratios.

ii. Administration and Technical Management Constraints

Concept. Differences in accounting knowhow or technical management ability may cause two entrepreneurs to obtain different incomes from the same production process technology. This is a training and technical assistance constraint.

Data. The same data are used here as for the production process technology constraint analysis. If profitability and/or capital productivity is much higher for firms of similar type and size in areas where education level is different, this constraint may be important.

iii. Product Mix

Concept. Similar resources (wood for furniture and tools) may be used in the same process technology (glues, shaping techniques, etc.) to produce very different products (chairs vs. packing boxes) and in different proportions. Two enterprises may have different incomes with similar process level technologies and management simply because the mix of products is more efficient in producing income.

7.1/ The "process technology" is the technique by which materials are physically processed, or the production process technique.

7.2/ "Engineering man" is not infrequently identified as contributing to unappropriate capital intensive production techniques in developing countries, and economists chastized for their deference to them in such decisions. See Wells, L. T. "Economic Man and Engineering Man: Choice of Technology in a Low Wage Country," *Public Policy*, 21, No. 3 (Summer 1973), pp. 319-342; Pickett, J., D. J. C. Forsyth, and N. S. McBain, "The Choice of Technology, Economic Efficiency and Employment in Developing Countries," *Employment in Developing Nations*, pp. 209-221.

Data. This constraint can only be identified with data on product mix which are not likely to be available at the project identification stage.[7.3]

iv. Input Price Constraints

Concept. An entrepreneur can increase his income by reducing the prices he pays for inputs without changing anything else in his enterprise.

Data. Large differences in profitability between cooperative enterprises (if the coops purchase inputs) would indicate this is an important constraint which is feasible to alter.

v. Output Price Constraints

Concept. Income can be increased if output prices can be increased. They might be increased by increasing quality of product or the way in which the product is marketed. The goods may be cooperatively marketed, sold at a different location, or sold at retail instead of wholesale.

Data. Large differences in profitability or capital productivity between similar enterprises in different physical proximity to markets.

e. Resource Availability Constraints

i. Concept

Resource availability constraints are limits in the size or quantities of resources available to the enterprise. In a certain sense, all of these "availability" constraints are only critical if efficiency is not. If the technology used in the enterprise is inefficient (that is, has a profitability ratio less than 0), then resource availability should not be considered a priority constraint since it will not increase income to put added resources into a process which cannot turn a profit. Some technological, or price relationship, must be altered, some resource use constraint must be attacked, before the availability of resources could limit income. Additional liquidity is not a constraint if current financial resources are not profitable, additional labor is not a constraint if current labor productivity is below the going wage.

ii. Data

It is important to use profitability, capital and labor productivity measures as an indication of the limiting nature of resource supplies. If profitability is high but income totals are low, that is strong evidence that additional

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7.3/ The ability of firms to increase income through more efficient product mixing will vary considerably among types of industries. Also, taking advantage of such a strategy requires a level of accounting sophistication not always found among small scale firms. Even modern firms of developed countries which product multiple products will not always have firm level accounting records necessary to determine the relative profitability of each product produced in a single plant, with some overlapping of machinery, materials, and/or worker inputs in the production of more than one product. It is possible that an intervention in this area might be of substantial assistance in some cases.

resources would increase income and therefore resource availability is the critical constraint. If income is determined more by the size of the enterprise than differences in profitability and productivity ratios, resource availability constraints would be suspected to be critically binding. To determine which resources (i.e., capital goods, raw materials, labor, and/or other inputs) are limiting income is very difficult. It is, therefore, convenient to view untied credit (or liquidity) as a general resource limitation, since it is fungible among a wide variety of resources—that is to say, credit can be used to lessen or eliminate any of the constraints. If the profitability and productivity ratios of small enterprises are high, and these enterprises are also credit scarce (that is, they use low levels of credit per unit output), liquidity and resource availability should be suspected as limiting factors and high priority constraints.

f. Marketing System Constraints

Concept. Roads, transport facilities and storage/handling facilities may be important constraints on enterprise incomes. These constraints manifest themselves as price constraints which force enterprises to accept a lower price for its product ... and in many cases the existence or nonexistence of these facilities may make such a price difference that no enterprise production of particular products is feasible. Where roads are poor, transportation in the hands of single or collusive transporters may exert monopsonistic control of producer prices. These are essentially constraints which exist external to the firm but exert a strong influence on the firm.[7.4]

Data. There are profitability and productivity differences between firms with different proximities to marketing facilities and transport networks. Constraint analysis will help to identify a project by pointing to problems and inviting thought about what solutions are feasible.

B Selecting a Target Group

One of the major purposes of the sector profile and the preliminary constraints analysis is to facilitate the selection of a target group for a particular project or for an integrated set of projects. Two separate steps in selecting a target group are facilitated by the two separate mechanisms.

a. The sector profile facilitates the process of determining what subpopulations or subgroups of enterprise households qualify as poor by A.I.D.'s definition.

b. The preliminary constraints analysis should suggest which subgroups have a high potential for improvement with interventions of the type A.I.D. can provide.

These two steps, first determining qualifying subgroups, and secondly identifying subgroups with potential for improvement with A.I.D. interventions, set the stage for the identification of a project implementable target group. In many cases the groups qualifying for assistance, and amenable to improvement may be so diverse (both geographically and conceptually) that it is not practical to implement a project to access them. The last stage in

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7.4/ The discussion of the impact of improved infrastructure on small scale firms has focused on both potential negative and positive aspects. It has been suggested, for example, that infrastructural improvements in rural areas increase competition from modern, large-scale firms located in the cities. In Ghana, on the other hand, it was found that small scale truck transporters facilitated internal trade, benefiting not only farmers but also small scale processors. Interestingly, the problems of collusion on the part of small scale truckers was also found in that country. See Anderson and Leiserson, *Rural Enterprise and Nonfarm Employment*, p. 37; and K. Hart, *op. cit.*, pp. 110-112.

target group selection is therefore to search for practical groupings around which a single project mechanism or institution could reasonably implement an intervention.

1. Determining Which Subgroups Qualify for Assistance

The sector profile attempts to estimate income for the various subgroups. This is important, for without it, it is impossible to determine which subgroups would qualify as "poor" for A.I.D. assistance. In defining "poor," either the congressional committee approved $150 per capita, or some more country relevant criterion could be used, but some standard in income terms needs to be used to determine where assistance is appropriate. The linkage section of the sector profile is particularly important since many enterprises in urban areas or larger scale rural industries may qualify due to their strong impact on the income of small farmers.

Since it is not practical to measure the income of a household or an enterprise before admitting them to participation in a project, it is necessary to look for project implementable proxies for income which can be used easily and fairly to determine admission to a project. The sector profile should assist in making first approximations at these admission criteria. For example, it may be that scale of operation is closely related to income, and all (or almost all) of those enterprises with less than 10 workers qualify as poor. Size of enterprise is a practical field criterion. Firms with over 10 workers could be identified and excluded with relative ease, while it would be impossible to measure income each time. Regional and product type groupings will also be helpful in defining groups that qualify in such a way that it will be practical to use the definitions in actual projects.

2. Identifying a Target Group with Potential for Improvement with A.I.D. Type Interventions

Using the preliminary constraints analysis to identify groups with potential for improvement with A.I.D. type interventions will suggest a wide variety of project alternatives which in turn imply the selection of different target groups for project focus.

3. Using the Target Group Selection Process to Identify Specific Projects

There is an obvious interaction between determining which groups can be positively affected by an A.I.D. intervention and identifying project. The most important element which must be added,which target group identification lacks, is the addition of an institutional mechanism. Project planners must conceive of an existing or feasibly creatable institutional structure to make the needed intervention. It should be remembered that most often project planners begin with an institution and a more or less completely hatched project idea before any target group identification or sector profile work is undertaken. In this more common case the information surfaced should not be used to justify that conception, but rather to refine it within the boundaires imposed by the institution selected. The more advisable course is to begin with an overview of the sector in the form of a profile, add to that an examination of the constraints which limit improvement for different groups in the sector, define a target group based on their level of poverty and potential for improvement, and last of all select mechanisms to attack some critical set of constraints.

CHAPTER EIGHT: CONSTRUCTING A DETAILED PROFILE OF TARGET GROUP FAMILIES AND ENTERPRISES

A Profile of Target Group Families

This section begins the description of those activities which would be related to the preparation of the project paper. The project identification and sector profile activities are preludes to a more detailed and focused examination of the specific target group selected for a particular project. The preparation of the target group profile presumes a data set most likely gathered directly for the purposes of project development. The data gathering process necessary to support the target group profile is described in Part III.

The purpose of the target group family profile is to provide project planners with a comprehensive view of the families to be benefited by project interventions. Three major dimensions of family welfare are important in the profile:

–a profile of family income and economic activity

–a profile of family employment patterns

–a profile of other dimensions of family welfare such as housing, health, nutrition, and education.

A short description of these profile elements with examples drawn from existing project documents is given below.

1. Income and Economic Activity Profile of Target Group Families

The income profile should include families of workers as well as those owning/operating rural enterprises. The subgroupings should of course include only those enterprise and family types selected as the focus of the project. In most cases, that will be a certain region, scale and class of enterprise. Table 8-1 presents an example of an income and economic activity profile for a project target group of small scale enterprises. The target group was selected as follows:

Region – Central Highlands

Scale – Less than 10 workers

Product Types – As indicated in Table 8-1.

Both enterprise-owning families and hired workers are included in the profile.

2. Employment Pattern Profile

The employment profile of target families should include the role of women in the enterprise, and employment in non-enterprise activities such as work on family or other farms. Table 8-2 illustrates the idea of an employment profile.

Table 8-1
Income and Economic Activity Profile
Small Scale Rural Enterprises
Guatemala, 1978

Sector	Income Profile of Small Scale Rural Entrepreneurs		
	Number of Families	Net Income per Family from Family Enterprises	Net Income per Capita from Family Enterprises
Wood Products	4,037	$886	$132
Textiles	17,944	500	73
Leather and Miscellaneous	6,729	744	130
Baking and Food Products	7,626	735	113
Commercial/Services	8,523	993	226

Sector	Income Profile of Workers in Small Scale Rural Enterprises			
	Wage Rate for Worker per Month	Net Income per Month for Men and Women Over 15 in Owner Family	Percent/Superiority of Owner Income per Month Worked	Net Income per Capita for Worker Family
Wood Products	$65	$81	24.6	$139
Textiles	21	32	52.4	45
Leather and Miscellaneous	31	47	51.6	66
Baking and Food Products	32	43	34.4	69
Commercial Services	28	60	114.3	50

Source: S. Daines computation based on person months worked for owner family members over 15 based on 1978 Rural Enterprise Survey by S. Daines, G. Smith, Ministry of Agriculture and BANDESA.

Table 8-2
Employment Profile of Rural Enterprise Families
Guatemala, 1978

Sector	Number of Workers in Family	Person Months[a] of Family Labor in Enterprise	Percent of Family Available Labor Utilized in Enterprise	Women as a Percent of Total Employment
Wood Products	1.58	12.9	68	8
Textiles	2.01	18.8	75	50
Leather and Misc.	1.71	18.8	92	17
Baking/Food Prod.	2.01	23.2	96	47
Commercial Services	2.28	19.7	72	65

[a]It should be noted that recall surveys such as this one perform less well with estimates of actual family labor worked in person months or in person days than with almost any other data types included in the manual. These employment figures are therefore to be used with caution.

Source: S. Daines computation based on 1978 Rural Enterprise Survey by S. Daines, G. Smith, Ministry of Agriculture and BANDESA.

Employment patterns can indicate to the project planner the seriousness of the labor constraint. For example, in the food and leather sectors additional labor would likely have to be hired outside the family. In the other sectors significant slack exists.

3. *Profiling Other Welfare Dimensions*

Information on housing, health and nutrition, while useful, may be too costly to generate. If they already exist they should certainly be included in the profile. Education and cultural information may also be extremely useful in building a complete picture of the target group.

B. *Profile of Target Group Enterprises*

The second segment of the target group profile shifts from the family to focus on the economic and technical characteristics of the enterprise itself. The enterprise is the vehicle for increasing welfare and it is important to examine its principal characteristics in an adequately structured profile.

The first general topic for the target group enterprise profile is the concept of efficiency. Efficiency should be broken into financial efficiency or profitability, economic efficiency with capital productivity as its primary indicator and labor efficiency using labor productivity as the indicator. The second general area for a profile is the structure of the enterprise, its output patterns, resource endowments, etc.

1. *Efficiency Profile*

Efficiency is an important concept to profile since it will help to sort project alternatives into two general classes: those which seek to increase the efficiency of the enterprise, and those which seek to expand the enterprise. If efficiency is low, then increasing efficiency should be the focus of project activities. If efficiency is relatively high and expansion potential is good, then expansion should be the project focus.

a. *Profitability Profile*

Profitability is a measure of financial efficiency. It is a measure of the value of profits earned divided by the value of assets (including working capital to finance variable costs) required to produce the profit. The concept is identical to that already described in the sector profile sections. In the sector profile the data will not often permit computation of enterprise profitabilities and it was indicated in that section that it is not likely worth the time and effort to gather the necessary data at that stage to do so While the omission of profitability analysis is permissable at the sector profile and project identification stage, to fail to include it in preparation of the project paper would be serious. The data necessary for profitability analysis are required not just for an enterprise profile of the target group, but also for cost benefit analysis, and financial feasibility determination. Table 8-3 provides an example of profitability profile for a target group of rural enterprises.

In most countries the cost of capital goods will have changed significantly between the time most enterprises purchased them and what they would have to pay today to expand and purchase additional equipment. It is

Table 8-3
Profitability Profile of Target Group Rural Enterprises
Guatemala, 1978

Sector	Current Profitability (Rate of Return to Total Capital Value at Cost Including Working Capital)	Expansion Profitability Based on Replacement Values for Equipment	Value of Equipment per Firm	
			Cost	Replacement
Wood Products	67%	32%	$823	$1,892
Textiles	54	36	615	968
Leather and Miscellaneous	64	34	750	1,490
Baking and Food Products	79	50	324	760
Commercial/Services	78	50	848	1,409

Source: S. Daines and W. Roach computations based on 1978 Rural Enterprise Survey by S. Daines, G. Smith, Ministry of Agriculture and BANDESA.

important, therefore, to compute not just what current profitability is, but what expansion profitability would be at today's prices.

b. Economic Efficiency—Capital Productivity

If we assume that capital is the scarcest of resources in a developing country, it would follow that the productivity of capital would be the best measure of economic efficiency. There are many measures much more satisfying in a more elegant and sophisticated sense in which all resources are given shadow or opportunity prices, but all these methods are complex and require time and data not usually available for the preparation of a project paper. The productivity of capital is, however, a simple computation to make and captures much of the meaning of economic efficiency since it tells us what society is getting in terms of output per unit of its scarcest resource. There may be situations in which other resources (such as limited primary material, skilled craftsmen, etc.) may be even scarcer than capital, and in these cases capital productivity would be replaced by, for example, "raw material" productivity as the best economic efficiency measure. Those sectors or target group enterprises with high financial profitability may not be the same as those with the highest capital productivity since prices may distort private returns away from socially most productive sectors. Table 8-4 illustrates capital productivity (value added per unit of fixed and working capital.[8.1]

8.1/ It has been argued that single resource productivity ratios are inappropriate because they exclude other important "causes" of the desired outcome and therefore depend upon subjective assessments of resource scarcity. This argument suggests that all resources are partially scarce and should be included in the ratio. All that is needed to construct a composite productivity ratio is a set of shadow prices at which to value each of the consumed resources. Benefit/cost ratios are the commonest of this variety. Composite productivity ratios are not without their weaknesses, however, as their very comprehensiveness implies a loss of detail. With a composite ratio the analyst cannot see the influence of land, separate from capital, or of differences between total, arable, and cultivated land ratios. This loss of detail can obscure important project interactions.

While the disadvantage of the composite ratio is that it obscures the contribution of each separate resource to the desired outcome, the parallel weakness of the single resource ratio is that it attributes all of the outcome to a single resource. Unless carefully used, either of these ratios can be misleading. Two solutions to this quandary have been used with varying degrees of success. The first is to compute both single and composite productivity ratios and use them in conjunction, realizing the limitations of each. The second technique is to calculate a production function, which is a rather complex method for assigning or attributing a proportionate share of production to each major resource factor. While the technique appears as if it provides a comprehensive solution to the problems caused by obscured and distorted attribution in productivity ratios, there are a number of drawbacks, both

Table 8-4
Capital Productivity for Small Scale
Target Group Enterprises
Guatemala, 1978

Target Group Subsectors	Value Added/Value of Capital (Fixed & Working)
Wood Products	1.30
Textiles	0.92
Leather, Ceramics and Fiber Products	0.98
Baking and Food Products	1.44
Commercial Enterprises	1.56
Services	0.31

Source: S. Daines et al., Guatemala Rural Enterprises, AID, 1978, p. 124.

c. *Labor Productivity*

Labor productivity is not a good efficiency measure in developing countries because it does not measure an output per unit of scarce resource since labor is not usually a scarce resource. The one exception is seasonal labor in those regions where this often becomes an acute problem. It is, however, useful as a welfare measure since it does indicate incremental addition to welfare per person. Table 8-5 illustrates a labor productivity profile for India.

Table 8-5
Labor Productivity Profile for Selected Agroindustries in India, 1965
(Value added per employee in Rs.)

Sector	Scale of Enterprise		
	Small	Medium	Large
Grain Milling	2,426	4,590	7,806
Food Preparation	2,243	4,145	8,705
Tobacco	1,369	1,441	16,486
Spinning and Weaving	2,423	2,549	3,444
Wood Products	1,802	3,279	1,149

Source: Annual Survey of Industries, 1965, India; quoted from **Employment Creation and Small Scale Enterprise Development**, Washington, D.C., IBRD, 1977, Annex 1, p. 10.

conceptual and logistical, which weaken the potential of production function analysis for mandate projects. The productivity ratio, with all of its difficulties, remains in practice perhaps the most useful project analysis technique. Much of this usefulness stems from its conceptual simplicity, the relative ease and low expense of implementation, and the relatively reduced data requirements.

For a review of the shortcomings, both methodological and empirical, of the CES production function, see D. Morawetz, "Employment Implications of Industrialisation in Developing Countries: A Survey," *op. cit.*, pp. 515-516; C. St. J. O'Herlihy, "Capital/Labour Substitution and the Developing Countries: A Problem of Measurement," *Bulletin of the Oxford University Institute of Economics and Statistics*, 34, No. 3 (August, 1972), pp. 269-280.

Labor productivity and labor efficiency are two different concepts. For example, the value added per employee in tobacco from small scale to large scale increases by a factor of 10, but this may be due simply to the fact that in the larger plant there is 10 times as much capital per laborer (i.e., capital has been substituted for labor, not that labor is working more efficiently).

2. *Enterprise Structure Profile*

In designing projects to improve enterprise performance, it is useful to have a profile of a wide variety of financial and technical characteristics of the firms in the target group. The types of information are simple and examples of each type are not necessary to visualize them. A single example is presented in Table 8-6. The list which follows, while not comprehensive, covers those which are of the most use to project planners.

—Credit use patterns

—Hired labor bill

—Family labor usage

—Savings patterns

—Value of capital assets

—Energy type and use patterns

As is indicated in the sections which follow, there are many other data items which are needed to conduct various parts of the project analysis which are not listed above. The topics noted here are the ones which would appropriately appear under the general heading of "Enterprise Profile."

Table 8-6
Sources of Finance for Small Manufacturing Businesses in Accra, Ghana, 1973 Survey
(percentage of firms in each size category)

Source of Finance	No Wage Workers	Wage Employees 1-9	Wage Employees 10-29	All Firms Surveyed
Personal Savings or Relatives' Money[a]	91.7	96.9	80.9	90.8
Derived in Part from Cocoa Farms	16.7	19.4	10.0	15.9[b]
Personal Savings Only	41.7	78.1	28.6	55.4
Personal Savings Plus Some Other Source	25.0	9.4	42.9	23.0
Bank Loans[a]	8.3	3.1	23.8	10.8
Number of Respondents	12	32	21	65

[a]Data on savings and loans add up to more than 100 percent where some firms used both bank loans and personal or relatives' financing.
[b]An additional 14.3 percent have relatives who own cocoa farms but did not assist in financing the business.
Source: 1973 Accra Manufacturing Survey, as found in W. F. Steel, **op. cit.**, p. 93.

CHAPTER NINE: ESTIMATING PROJECT POTENTIAL

In the A.I.D. context agribusiness and rural enterprise projects are undertaken to improve the welfare of the poor majority. The next three chapters deal with three basic project issues:

–What will the project benefits be? (What is the magnitude and probability of improvement in target group welfare if the project is implemented as designed?)

–Can the project be implemented as designed? (What is the probability that the project is feasible?)

–Do probable project benefits justify project costs?

These three topics will occupy the attention of the three chapters which follow, and an attempt will be made to explore the possible methods of analysis which can focus data and judgment on each issue. Project analysts familiar with A.I.D. and other international donor procedures will recognize the last two issues as the traditional project analysis topics of "feasibility and cost benefit analysis." One of the major intents of this manual is to emphasize the importance and common neglect of adequate analysis of the first issue, which relates to estimating the potential of the project to create improvements in target group welfare. The most common inadequacy in current A.I.D. project analysis is the weak basis for estimating target group benefits which would be caused by the project intervention. Very often projects contain adequate exploration of project feasibility (institutional and enterprise level capacities) and relatively extensive benefit/cost analysis, but lack any systematic evidence that the assumed benefits will actually happen. This chapter is devoted to presenting methods for estimating project potentials for creating target group benefits.

The methods for estimating project potential may be divided into two general categories based on the data required. The first methods require some type of systematically gathered and statistically representative accounting information on target group enterprises. These methods are treated in Sections A-G in this chapter. The other methods range from no data required at all (expert judgment) to methods requiring accounting data but not statistically representative of target group enterprises as a whole (micro or case study estimates). These methods are discussed in Chapter 13. The fact that this chapter is devoted to formal or relatively structured methods does not imply that other methods are not important. In current practice informal methods make up the bulk of project analysis and in many cases use logical and reasoning methods equal in complexity to the more standard and structured methods outlined in the first six sections. The reason for the relative lack of attention of non-formal methods in this manual stems from two problems with these methods—the first is a problem of substance, the second one of presentation.

–Given the lack of serious evaluation of project impacts for projects using informal estimates of project potential, it is difficult as yet to test the validity of these methods.

–The informal methods tend to be highly personal; that is, the procedure, logical reasoning chain, or analytical processes are as varied and numerous as are the analysts or officials who use them. There is little which is standard or generalized which could be presented in a manual of this type. These methods depend on the analyst and his experience.

A. Accounting Methods for Analysis of Project Potential

Common to all of the data-based estimation methods of project potential is the requirement of simple accounting information on a more or less representative group of target group enterprises. Section A outlines the accounting procedures necessary to provide this information. This section does not discuss the methods for obtaining the raw information from the enterprises; that topic is discussed in Part III. The discussion here deals with how to manipulate the raw data into simple accounting concepts required by the analysis methods described in sections B through G.

1. Welfare vs. Efficiency Accounting Concepts

Care must be taken in accounting to make certain that the accounting definition fits the intended analytical use. There are two basic intents of project analysis dealt with in this section which require different types of accounting information. The first is the need for accounting information which measures the family welfare which results from enterprise activities. The second measures the efficiency of the enterprise. From an accounting point of view welfare results depend on who owns the resources (labor, land, capital goods), whereas efficiency does not. Efficiency depends on how much of some output is produced per unit of resource utilized regardless of who owns that resource. An example may serve to sharpen the difference between these two types of accounting. If we wish to measure the income welfare resulting from enterprise activity to the operating family, we would not subtract out the labor which the family provided as a cost, yet if we wish to measure the efficiency of the enterprise this family labor would need to be counted as a cost or as a "utilized resource."

Efficiency and welfare are not unrelated subjects; both concepts must be addressed in estimating project potential and feasibility. There is no need to discuss which of the methods is superior as they are not competing. Each serves a different analytical function and both are needed to address different issues.

a. Income Definitions for Welfare and Efficiency Measurement

Net income definitions for estimating welfare and efficiency are given below.

–NET INCOME: WELFARE DEFINITION

Value of enterprise output (sold, traded, or consumed) minus cash or in kind expenses, and depreciation allowance on durable goods outlasting the production period.

–NET INCOME: EFFICIENCY DEFINITION

Value of enterprise output (sold, traded, or consumed) minus actual or imputed costs of all labor and resources used up in production, depreciation allowance on durable goods outlasting the production period.

In the efficiency definition all resources used in the production process must be treated as a cost regardless of who owns them.

b. Imputed Costs for Efficiency Accounting

Where a resource is owned by the operating family such as family labor, machinery or circulating capital funds, a value must be "imputed" to the cost of utilizing this resource even though no actual out-of-pocket expenditure is made. The normal convention used to establish a price for an owned resource is "replacement cost." For example, in the case of family labor an estimate would be required of the number of person/days worked by adult males in the family; this total quantity would then be multiplied by the average daily wage which would have had to be paid to "replace" this family input with purchased labor services In some cases, adjustment should be made for skill level and age factors so that comparable wages are imputed for comparable types of labor services. Since an owner/operator performs management as well as labor services, it may be difficult to adequately account for the replacement value of his management services. Most computations are for the purpose of comparison, and as long as most comparisons are between similarly managed owner/operator firms, no comparative distortion would result

Imputed returns must also be calculated to the value of owned fixed capital goods and for the value of circulating capital which is tied up in paying for annual costs. These imputed cost items are usually called "imputed interest" or imputed return to capital. The method for this computation involves an estimate of the book value of owned assets utilized in the enterprise. An estimate of the value of circulating capital required to operate the firm may be computed by taking the average cash expenditure level during the year, or it may be estimated by taking the total annual value of non-durable expenditures and multiplying that figure by a turnover ratio which is used to approximate the rate at which circulating capital expenditures would be replaced out of receipts. This figure varies widely by enterprise type and is related to the seasonality of the production cycle. For most rural enterprises it will be from 60 to 90 days. The value of circulating capital is then added to the total value of assets utilized in the production process to approximate the total value of fixed and working capital. This total value of capital is then multiplied by an imputed interest rate which is taken to be the interest rate at which a similar enterprise with acceptable credit standing could borrow. This imputed interest constitutes an assumed reasonable return to owner's capital.

Efficiency accounting for income results in a figure similar to that which is called "pure profit" by economists in that reasonable returns to all factors have been subtracted from gross value of production. When reasonable returns have been removed for owner's labor, management, and capital the residual even in attractive businesses may be negative. These negative numbers need not surprise or discourage the analyst, since their use should be as comparisons, not mainly as absolutes. The difference between efficiency and welfare measures can be seen in the case where the efficiency measure of income "pure profit" is negative, but the entrepreneur is making a good management, labor and capital return on his effort and investment.

An illustration of these methods of accounting can be seen in Table 9-1 from a rural enterprise project in Guatemala.

The efficiency rate of return measure in Table 9-1 is the pure profit divided by the total value of fixed and circulating capital. The welfare rate of return is the net income to the family divided by the total value of fixed and circulating capital.

Table 9-1
Welfare and Efficiency Measures of Income for Small Scale Rural Enterprises, Guatemala, 1978

Enterprise Type	Net Income to Family (Welfare Measure)	Efficiency Measures of Income and Imputed Costs			Rate of Return	
		Imputed Family Labor & Management	Imputed Return to Capital	Pure Profit	Wel.	Eff.
	(US$ per Enterprise Family/Year)					
Wood Products	$797	$791	$111	$-111	67%	-9.4%
Textiles	445	388	82	- 25	54%	-3.0%
Leather and Miscellaneous	664	577	105	- 18	64%	-1.7%
Bakery and Cereals Prod.	656	670	83	- 97	79%	-11.7%
Commercial Enterprises	887	552	114	+221	78%	+19.4%

Source: S. Daines et al., **Guatemala Rural Enterprises** (Guatemala: Agency for International Development, 1978), 146 p. (Computed from results of the Rural Enterprise Survey by S. Daines, G. Smith and BANDESA, 1978.)

2. *Capital and Inventory Accounts*

Even though rural enterprises and most agribusinesses in developing countries are small, they are nonetheless complete businesses using capital goods, accumulating inventories, making expenditures in one period for production in another, producing a varied bill of products, etc. In order to obtain reasonable accounting estimates of net income, all of the normal accounting conventions used for large businesses must be applied to the small scale rural enterprise as well.

a. Valuation of Capital Goods at Original Cost or Replacement

Valuing capital goods at their original cost or at replacement may make a sizeable difference in the rate of return expected in a project. The choice of valuation method depends largely on the project intent. If the project intends to provide advice to entrepreneurs, but not to provide funding for new equipment, it may be that the relevant valuation is at original cost since the project intervention should not result in the introduction of new capital. If the project aims at expanding the credit availability to the entrepreneur with the intent of updating or replacing his equipment or expanding the capital goods base of the business it would be well to examine profitability using both valuations. The rate of return calculated at original capital cost would tell the analyst how efficient the enterprises are currently, while the replacement value computation would indicate probable efficiency with project funds. Table 9-2 presents a "welfare" rate of return computation using both original and replacement valuations of capital for Guatemalan small scale enterprises in 1978.

b. Amoritization of Capital Goods

Capital goods represent a surprisingly large proportion of the costs of small scale rural enterprise production. In the 561 rural enterprises surveyed in Guatemala, averaging only two workers per firm, the average value of capital

Table 9-2
Rate of Return (Welfare Measure) Using Original Cost and Replacement Cost Valuations of Capital in Small Scale Enterprises
Guatemala, 1978

Enterprise Type	Rate of Return ($ of Net Income/Value of Capital) Fixed Capital Valued at	
	Original Cost	Replacement Cost
Wood Products	67%	32%
Textiles	54	36
Leather, Ceramics, Miscellaneous	64	34
Baking and Food Products	79	50
Commercial Enterprises	78	19

Source: S. Daines et al., Guatemala Rural Enterprises (Guatemala: Agency for International Development, 1978), p. 53.

goods was $940 original cost and $1,569 at replacement cost. To disregard capital goods as an annual cost would be a critical mistake. The composition and value of capital must be estimated, and simple depreciation schemes must be used to charge an annual allowance against the income accounts. The method for depreciation (straight line, declining balance, etc.) and the estimates used for useful life are less important in themselves than that they be used consistently across all enterprises studied so that comparability of the data is assured.

B. Firm Level Constraints Analysis

The potential of a project for welfare improvement depends directly on whether the project intervention addresses an important and correctable need in the targeted enterprises. Identification of critical constraints at the firm level must be an integral part of project design and estimation of project potential. This section discusses alternative ways of using enterprise level data to examine what factors may be most severely constraining improvement in the target enterprises.

1. Accounting Information

A careful review of accounting indicators may point to critical needs in the target enterprises.

A review of absolute and comparative profitability may provide insight into the need of the enterprise to improve its financial efficiency. In reviewing profitability as well as the other accounting indicators, a list of potential ways in which the small scale enterprise may increase its net income should be kept in mind. This list is the same as was used in outlining sector level constraints. Income improvement may be achieved by:

—Increasing the quantity and/or value of output per unit input

- by changing process level technology or practice
- by improving management practices
- by changing the mix of products produced

—Increasing the quantity of output with added inputs

- by expanding all inputs through additional liquidity

—Increasing the prices for outputs or reducing prices for inputs

-by improving product quality

-by changing marketing practices (inputs or outputs).

The process of linking firm level accounting indicators with constraints was discussed in Chapter 7 and need not be repeated here. It is important to note, however, that there may be considerable variation in the basic needs of different types of enterprises. Some may have favorable market situations and room to expand, while others may require fundamental internal management and technological restructuring before income can be increased. Firm level data will assist in identifying both the commonalities and differences in such a way that project interventions can be tailored to actual needs.

2. *Entrepreneur Perceptions of Constraints*

A second way to explore the relative importance of alternative firm level constraints and potential project interventions is to ask the entrepreneurs themselves in large enough numbers so that the results could be expected to be representative. Given the subjective nature of questions about constraints, the method for interviewing is fraught with possibilities of misunderstanding and inaccurate reporting. It is, however, useful to do since it gives the project designer a reasonably representative view of how entrepreneurs respond to questions about their businesses and what factors are holding them back. How the entrepreneur perceives his problem is important project information even if it is later decided from more objective data that his perception is incorrect. In the last decade there has been a general and growing consensus that small farmers are rational economic men and very often have correct perceptions about how to manage and improve their businesses. While there is less concrete evidence available on small scale enterprises, the evidence extant would support the idea that the small scale entrepreneur is reasonably rational, and his opinions about constraints should be seriously considered.

One method for obtaining opinions on constraints is to ask a representative sample of entrepreneurs a question phrased as follows: "What are the most important reasons you do not expand your production in the coming year above your planned level?"

The entrepreneur may then be allowed to freely respond, or may be given a series of alternatives to choose among with "other indicate _____" as one of the choices. He may also be asked to indicate which reasons are first, second, or third priority of importance. Where the question is open ended the interviewer may have a preset list of alternatives among which he classifies the response and may add to the list of the entrepreneur suggested other reasons. Of the five surveys in which some variant on this technique has been used with which the author is acquainted, interviewers indicated that the entrepreneurs respond almost universally without much hesitation and most are able to grasp the concept of ranking the reasons and seldom appear uncertain about their priorities. Additionally, open ended responses do not significantly increase the complexity of coding, since almost all responses fit easily inside a preset list of less than ten major reasons. To be sure, there is much overlapping in concept between different factors. Credit as a constraint, for example, may overlap with increased supplies of raw material or scarcity of labor, since credit is fungible and may be used to purchase increased raw material or hire additional labor. While the tool of obtaining entrepreneur opinions is not a precise one, it can be very useful. Table 9-3 presents the results of a sample of 561 small scale rural enterprises in Guatemala conducted in 1978.

Table 9-3
Entrepreneurs' Reported Reasons for Not Expanding Production
of Small Scale Rural Enterprises in Guatemala, 1978

Enterprise Type	Percent of Entrepreneurs Responding by Reason and Priority							
	Lack of Market		Lack of Credit		Lack of Raw Material		Lack of Labor	
	1st	2nd	1st	2nd	1st	2nd	1st	2nd
Wood Products	17%	3%	55%	10%	3%	41%	7%	7%
Textiles	7%	4%	69%	13%	7%	19%	5%	23%
Leather and Misc.	4%	17%	75%	8%	6%	17%	13%	13%
Bakery and Food Products	8%	17%	63%	21%	8%	25%	4%	4%
Commercial Enterprises	6%	13%	67%	14%	3%	11%	3%	8%

Source: S. Daines et al., **Guatemala Rural Enterprises** (Guatemala: Agency for International Development, 1978), 149 pp., p. 113.

C. Estimating Project Potential for Target Group Family Impacts

Estimating the potential of the project to increase income, employment or some other welfare impact will require a different technique for each type of intervention. There are, however, some general principles which may apply to most of the common project types.

Most projects propose to provide some added service, input or infrastructure to the enterprise. Each project operates on a hypothesis about change, that the chosen intervention will cause additional welfare. At this stage we are not asking project feasibility questions; we assume that the project intervention is feasible. The issue addressed in this discussion is: if accomplished what will be the income or employment impact? It should be noted that informal, non-data approaches to estimating project potential are discussed in Section H of this chapter and are not explored here.

1. Comparisons of Enterprises With and Without Project Intervention

The first method of obtaining evidence indicative of the potential impact of the project intervention on income, employment or other family welfare dimensions is to compare the income, etc., of enterprises with and without the proposed project intervention. If the intervention is credit, then the comparison should be between those enterprises with and without credit services, but of similar size and cultural setting as the project targeted enterprises. This comparison may also be drawn, if possible, from a before and after measurement (i.e., before and after a similar intervention). The probable non-existence of any systematic before and after comparison of similar enterprises in a similar cultural setting for the particular intervention proposed, usually precludes the before and after approach. It should be noted that adequate post hoc evaluation of the proposed project will provide such a before and after comparison for future projects.

Setting aside the use of "before and after" comparisons as a basis for estimating project potential for the reason that they rarely exist, we pass to discuss the method and limitations of "cross sectional" comparisons. The idea of a cross sectional comparison is to find enterprises with and without the proposed project intervention to

identify what the actual difference in income, employment, etc., is, with the implication that if the project provides the intervention to those enterprises "without" in the comparison they would achieve the income levels of those enterprises "with" in the survey. This approach has a number of strengths and weaknesses; the discussion which follows attempts to examine both.

a. Can "With and Without" Enterprises be Easily Found in the Target Area?

The first difficulty with cross sectional comparisons arises from the fact that the proposed intervention may in fact be new to the target area, and in fact may be new to the country as a whole. If the intervention is common, one might argue, there is no justification for a project to introduce it. Careful examination of the project proposed intervention, in most cases, will reveal however that the project will extend or expand a service or input availability rather than actually introduce it. While there may be strong reasons for A.I.D. wanting to present the project as something "new," almost always the specific intervention is something which has existed in the field in infrequent or insufficient quantity. If we take the major enterprise project intervention alternatives as examples, the lack of newness in most country cases may be more obvious. In most cases the element which is new in the A.I.D. project is the method of delivering or organizing the intervention, not the existence of the intervention itself. Much of A.I.D.'s traditional concern has been with the feasibility of the delivery rather than the potential impact if the delivery is feasible. Analysis of the question of whether A.I.D.'s new delivery mechanism is feasible is left to the next section.

The above discussion may be clearer if examples from each of the major project interventions are examined. First the potential of credit as an intervention could be estimated by measuring the income of enterprises with different levels of credit. If those enterprises with credit had incomes double or triple those of similar enterprises without credit, that could be evidence that a credit intervention would have an income impact. It is unlikely that there are so few enterprises with any credit that such a comparison would be impractical. Credit may not have been delivered the way the A.I.D. project proposes to deliver it (in most cases even the basics of the delivery system which A.I.D. proposes can be found to exist in enough cases to make a comparison viable), but in almost all situations the basic intervention which A.I.D. proposes (i.e., increased credit) exists in sufficient quantity in the target or similar areas to permit a comparison.

Technical assistance may be more difficult to analyze, but is in many ways similar to the credit example in that it is usually the delivery mechanism which is new or novel and not the final intervention in the firm. Examining the potential of technical assistance requires an examination of the actual firm level intervention to be accomplished in the event that similar technical assistance has not been extended to sufficient enterprises to provide a viable comparison. The technical assistance situation may be divided into two possibilities. First is where there has been a sufficient number of enterprises already recipient of the proposed service that a comparison of their performance with those not receiving the service is possible. Second is situations in which the service is entirely unexperimented. Where there is experience, the comparison is direct and relatively easy to make between those enterprises receiving none and varying amounts of the assistance. Table 9-4 illustrates this type of comparison using small farms in Guatemala as the example.

In the event that technical assistance (TA) of the type the project proposes has never been tried, an attempt can be made to determine what the changes in served enterprises will be; in agricultural terms, what is the "package"

Table 9-4
Income Comparison of Small Farms with Different Levels of Technical Assistance: Guatemala, 1974

Technical Assistance Level	Farms with TA linked to Other Services	Farms with TA but without Other Services
	(US$ of Net Income per Hectare)	
No Technical Assistance	$45	$ 76
1-4 Visits of TA	53	105
5-9 Visits of TA	68	89
10+ Visits of TA	86	123

Source: S. Daines et al., **Guatemala Farm Policy Analysis** (Washington, D.C.: Agency for International Development, 1975), p. 106.

that the TA will attempt to get adopted. If the objective of the TA is to get a certain type of enterprise to change its practices to use a new input or type of equipment, then that practice or input or equipment is the intervention and firms currently using the recommended practice, input or equipment could be compared with those who are not to derive an estimate of the potential impact of the intervention. Field measurements as opposed to experiment station or engineering estimates have the substantial advantage of realism if they are taken in the same general cultural and economic environment as the proposed project. There has been so much slippage between what the experiment station said should happen, and what actually happened, that project designers should have a strong desire to know what actually happens in their proposed target area when real enterprises adopt the designers' proposed practice, input or equipment.

Such evidence is, of course, not conclusive. One might argue that the observed intervention was not as well organized or not as well oriented as the one the project plans. However, such measurements provide a baseline from which intelligent discussion can proceed. It is unfortunately true that the A.I.D. project development environment has created an atmosphere of advocacy in which project designers are cast at a very early stage as defenders and not really analysts. They may choose not to undertake comparisons such as those described above simply because they would rather not have to explain away negative findings; they know that in the project review cycle an assertion of potential is given roughly equal weight to an evidenced finding of project potential. Having the evidence also has the significant disadvantage in the project review process that it almost inevitably leads discussion by project opponents into the weakness of measurement procedure; it is easier to attack a quantitative comparison (for example, the groups were not similar enough, the sample not representative enough, all other factors were not equal, etc.) than it is to attack a bald assertion of potential. If not actually easier, the discussion can be much longer.

2. *Accounting Projections*

The second method of estimating project potential using firm level enterprise data involves using the accounts as a basis for making impact projections. These projections may be based on expert judgment about what will happen if the project intervention is implemented, or may be based on the expressed intent of surveyed entrepreneurs. It is important to note that the judgments or expressed intent is not with reference to the final impact,

but rather some specific change in the firm. The simplest case would be a project whose intent is to simply expand the production in targeted firms without changing their technology, practices or efficiency. In this case the analyst would use the firm level data to estimate first how much expansion could be obtained per unit of project input, and then how much net income would result by using the net income accounts for each enterprise type. These accounting projections are much less reliable than actual comparisons based on an observed intervention because there are many assumptions involved. Assume, for example, that the input provided by the project is credit, and the intent is to increase production without changing technology. To add reliability to these kinds of projections, the intent and interest of actual entrepreneurs can be measured and compared with the project designer's assumption that they would take additional loans and use them to expand their production. Each additional field measurement expands the evidence base and reduces the reliance on the analyst's best guess. Each project intervention presents a different problem in defining how to estimate welfare potential and how to increase the reliability of that estimate.

Table 9-5 presents an impact estimate in which 561 entrepreneurs indicated the quantities of project input they would want, and what they would do with it if free to choose. The estimates in Table 9-5 illustrate one example of the use of enterprise accounting data (net income accounts, credit/output ratios, etc.) and entrepreneur intent data (size of loan desired, and intended use of funds) to estimate the total income potential of a proposed rural enterprise project.

Table 9-5
Estimated Income Impact of Rural Enterprise Project
8 5 Million US$ of Credit[a] Disbursed
(Owner Families Only)

Sector	Average Loan Size Requested	Number of Families Benefited	Net Income Increase[b]	Percent Increase in Family Income
Wood Products	$2,380	504	$701	79
Textiles	800	1,500	265	53
Leather	2,133	609	670	90
Baking/Foods	1,939	619	892	121
Comm./Services	1,290	930	593	60
All Small Scale Enterprises		4,162	$544	75

Source: S. Daines computations based on 1978 Rural Enterprise Survey by S. Daines, G. Smith, Ministry of Agriculture and BANDESA.

[a]Of the 8.5 million disbursed, $6.1 million would be disbursed to small scale enterprises where the owners are part of the target group poor. Medium and large scale enterprises, owned by non-target group families, will result in income benefits to workers hired from target group families.

[b]The net income increase is per family per year. That is, target group owners of wood products enterprises would earn an additional $762, and after paying back the loan at 8% would have a net of $701 of added family income which is a 79% increase over their pre-loan family income level.

CHAPTER TEN: EXAMINING PROJECT FEASIBILITY

A project may have excellent potential for improving the welfare of the target group and yet not be implementable due to any of the following infeasibilities:

—The institutional structure is incapable of providing the service, input, or infrastructure intended;

—The enterprises targeted are not willing and interested in the services or inputs of the project; there is no demand for the project intervention in the way it is offered;

—The project intends to expand output and there is insufficient demand for the product or project enterprises cannot price compete with alternative producers.

Each of these situations raises a feasibility issue questioning whether the project can be implemented as designed, can the institution do it, will enterprises be interested, is there a market for the product? The purpose of this chapter is to explore methods for the examination of the feasibility of agribusiness and rural enterprise projects.

A. Institutional Capacity

A wide variety of institutional capacities ought to be the subject of feasibility analysis. In many cases, this analysis is complicated by the fact that one of the common project objectives is to strengthen particularly weak aspects of the institutional structure. Where institution building is one of the central objectives of the project, the analyst must first estimate the feasibility of the institution building component (i.e., is the institution capable of absorbing and internalizing the proposed improvement?), and then proceed to analyze whether the institution as improved will be capable of realizing the other project responsibilities.

The methods for examining institutional capacity are not standard or systematic enough to be the subject of extensive exposition. Some factors can of course be quantified, yet in the main the subject is more one of judgment than of statistics. What can be done is to suggest a series of topics which should be examined, and to present ideas drawn from specific cases of the methods and information which have been used.

1. Outreach Capability

Most agribusiness and rural enterprise projects involve the delivery of some kind of input or service to a large number of enterprises. The geographic dispersion of these enterprises often complicates the delivery problem. The capability of the institution to service large numbers of small scale enterprises and interact with clients whose business and accounting expertise is very limited is usually a vital issue.

2. Financial Capability

Funds and resources will usually be channeled through an existing host country institution. The financial integrity and performance of the institution is of utmost concern and should comprise a large part of the institutional

analysis. Such issues as the proportion of current loans delinquent are useful indicators for credit institutions. The capacity of the institution to commit counterpart funds necessary for the operation of the project should also be a topic for examination based on both the apparent availability of the funds and the apparent commitment of institutional management personnel to the allocation of funds for project purposes.

3. Technical Capability

Where projects involve technical expertise, which includes almost all conceivable rural enterprise projects, an assessment of the industrial engineering, enterprise management and technical assistance personnel and systems should be an integral part of an institutional capacity review.

B. Financial Feasibility

There are two important aspects of financial feasibility: first and foremost is the issue of the profitability to the entrepreneur of the intervention, and secondly the financial viability to the involved institutions.

1. Firm Level Profitability

While firm level profitability implied by any intervention is a useful element in many aspects of project analysis, it is never more important than in the feasibility section. If an intervention does not have a very high probability of increasing profits to the entrepreneur, it should not pass the financial feasibility test. This seems so obvious as to not need restatement, yet very few project analyses provide satisfactory evidence of this potential beyond the assertion that the intervention will be profitable. Firm level data based on enterprises in the target area, or at least in similar areas, indicating profitability measures where the proposed intervention has already existed should be presented to support the assertion that the intervention is financially feasible.

An additional difficulty related to firm level profitability of the proposed intervention is the fact that entrepreneurs may not appreciate the profitability potential of a workable and profitable intervention and may not, therefore, be willing to participate. While this may be treated as a financial feasibility issue, this document deals with this issue in section C below under the heading of demand for project services.

2. Institutional Level Financial Feasibility

In addition to concerns about the financial capability of an implementing institution, there is the concern that the particular project proposed will not return sufficient funds to allow the institution to retain its financial viability. This is particularly true of credit operations, but may extend to technical assistance and research programs in that project activities may drain institutional resources without proper allowance for their replacement. Interest rate policies, public commitments to institutional budget allocations are all topics of analytical concern when examining the question of institutional financial feasibility.

C. Estimating the Demand for the Project Intervention

While some rural enterprise interventions may be less sensitive to the existence of field demand for the service or project input, it is usually true that target group interest in and acceptance of the project idea is a crucial feasibility issue. It is important, therefore, to be able to estimate the magnitude of interest and willingness to participate in the project among the target group of intended beneficiaries. The method for estimating the demand for the project intervention varies by type of intervention. Credit demand presents a variety of analytical methods while the demand for technical assistance and research services presents only a few.

1. Estimating the Potential Demand for Credit and Financial Assistance to Agribusiness and Rural Enterprises

Credit interventions depend centrally on the interest of entrepreneurs to undertake additional liability, and there is considerable concern indicated in the literature that small scale rural entrepreneurs may be overly cautious in avoiding risk which may impel them to avoid even wise borrowing. An important project feasibility issue for credit projects or credit components of broader projects is whether there is sufficient interest and willingness to borrow among target group enterprises.[10.1] There are at least four methods which might be used to estimate that demand, and each is given a short description below.

a. Ask a Representative Sample of Target Group Entrepreneurs

The most obvious, and probably the best, method is to ask the entrepreneurs themselves if they have interest and are willing to participate. In accomplishing this task it is necessary only to ask a sample of the firms as is described in Part III. The manner in which the questions relating to their possible interest are phrased may provide different perspectives on the issue which may be of considerable use to project planners. Three approaches are described below, each providing a different measure of entrepreneur interest.

i. General Interest in Credit

Entrepreneurs can be asked about their general interest in credit as a priority intervention in order to assess the general perception of target group entrepreneurs about the importance of credit. This may be done either in an open-ended question about what they need to improve their business and then tally the proportion who said credit was the most crucial. A list of potential constraints may be named and the entrepreneur may be asked to comment on the relative importance of the ones named. Both of these alternatives are described and illustrated under the discussion in Chapter 8 on firm level constraints analysis. The entrepreneur may alternatively be queried about the availability of credit and asked if there is sufficient available for his needs. This general response may be quite different from more specific methods, but may give a better idea of the "promotable" level of demand, or that level of demand which may be accessed with adequate promotion.

10.1/ R. L. Meyer, "Financing Rural Nonfarm Enterprises in Low Income Countries," *Economics Occasional Paper*, No. 552, Ohio State University, Columbus, Ohio, October, 1978, pp. 9-10.

ii. Interest in Borrowing and Possible Uses

Many entrepreneurs may be interested in credit in general and sense its importance to the improvement of their enterprises, but may still be unwilling to undertake the added responsibility and risk of borrowing. As can be seen in Table 10-1, in a survey of 561 small scale rural enterprises in Guatemala, 77% indicated that credit was their first or second priority need, yet only 60.7% indicated that they actually wanted to borrow additional money during the coming year; 16% were apparently only generally concerned but not willing to take the risk of additional liability.

In order to ascertain the willingness to take the additional risk, three elements should be added to the questions of general interest. The first element is the description of terms and conditions under which credit could be extended. A question such as: would you be interested to borrow additional money at 10% interest with a mortgage or other security, for repayment on a monthly quota basis beginning in 6 months, for a 12-month period? The very specificity of the question will help sort out those responses which are not grounded in actual effective interest. The second element which can be added is the issue of what the entrepreneur would use the credit for. If he has specific ideas already in mind with reasons why he thinks such investments or purchases would return the necessary money for repayment, one has the feeling that the demand estimate is closer to "effective" demand. The last element which has been effective in reaching a more realistic estimate of demand is to ask the entrepreneur how much he would be interested in borrowing for each of his intended uses. Not only does this final element make the estimate of "effective" demand more reliable, but it also assists in estimating the quantity of demand.

Table 10-1 indicates the responses of 561 small scale entrepreneurs in rural Guatemala to both the general question format, and the more specific willingness to borrow formulation.

Table 10-1
Credit Demand Responses for Small Scale Rural Enterprises, Guatemala, 1978

Enterprise Type	Percent of Firms Indicating that Credit is Their Principal Problem	Percent of Firms Requesting Added Loans under Stated Terms and Conditions	Average Amount of Added Loan Requested per Firm
Wood Products	65%	72.4%	$2,380
Textiles	82%	58.6%	800
Leather and Misc.	83%	73.1%	2,133
Baking and Food Prod.	84%	57.9%	1,939
Commercial Enterprises	81%	60.5%	1,290

Source: S. Daines et al., **Guatemala Rural Enterprises** (Guatemala: Agency for International Development, 1978), p. 42.

iii. Specific Response to Project Interest

The third level of specificity which may be used to estimate demand is to mention the proposed project by institutional name, stating the project terms, conditions and qualification requirements, and then asking about the interest of the respondent in participating during the coming year. It must be clear that the survey does not imply any kind of a commitment on the part of the project so that problems are not created for the institution by the survey.

By using these methods, if the sample is indeed random and of sufficient size to provide satisfactory statistical reliability, a reasonably realistic estimate of the demand for credit may be ascertained. The individual firm responses may be expanded to fit the size of the target group population of enterprises and the total credit increment may be used, subject to the cross checks outlined below as an estimate of effective demand.

b. Derive Credit Demand from Product Demand Estimates

An alternative to the survey approach in estimating credit demand, and a cross check on such an estimate if made, is to estimate the demand for the products which would be produced by the target enterprises and then working backward, estimate the additional credit which could be absorbed without exceeding the product demand estimates. This method may be an important cross check since individual entrepreneurs may each perceive a favorable demand situation, yet if all expand at once the demand may rapidly disappear. Each firm may perceive correctly, yet the sum of the perceptions is incorrect; this is the idea of the "fallacy of composition."

Projecting the demand for products of small scale enterprises may be very difficult to do, both because of lack of data and conceptual problems. If accurate demand statistics are available, such as price or income elasticities, income growth rates, etc., demand may be approached directly. Since these data are seldom available, demand must be estimated indirectly from extrapolated production trends. Credit supply can then be projected, and assuming a constant credit/output ratio, a credit shortfall or credit demand can be estimated. Table 10-2 illustrates this approach for medium and large scale agribusinesses in Guatemala. From the table it can be seen that only in food products is there a credit shortfall, hence only in food would this method indicate a demand for additional credit in medium and large scale agribusiness enterprises.

Table 10-2
Credit Demand Estimated from Output Growth and Credit Supply Growth Rates
Medium and Large Scale Agribusiness Enterprises
Guatemala, 1978

Subsector	1975 Value of Output $000,000	1975 Credit $000,000	1975 Credit/ Output Ratio	Credit Annual Growth Rate	Output Annual Growth Rate	Credit Annual Shortfall US$
Food Products	$333	$20.2	.06	-4.4%	6.7%	$889,000
Textiles	51	12.1	.24	8.8%	2.8%	-0-
Clothing	18	5.8	.31	6.6%	3.9%	-0-
Wood Products	34	2.4	.07	12.9%	4.8%	-0-

Source: Dirección General de Estadistica, Encuesta Trimestral de la Industria Manufacturera Fabril, and Banco de Guatemala, Prestamos Concedidos por el Sistema Bancario a la Industria, Guatemala, 1976.

c. Breakeven Analysis of Credit Productivity

A third method for estimating the demand for project provided credit is based on a micro-economic analysis of the accounting relationships within the firm. This method would attempt to measure the net income productivity of credit for the last unit of credit obtained by the average firm for many types of firms representing the target group to be accessed by the proposed project. If the estimated net revenue product of the last credit

unit supplied to the firm is significantly above the cost of credit (interest and related costs), then it would be assumed that a rational entrepreneur would desire more credit. Assuming a profit maximizing businessman and the analysis could estimate the total amount of credit which the firm could absorb before the benefit (net revenue produced) by the credit equaled the cost of the credit.

While this method is conceptually interesting, it normally requires a data base and time frame for analysis beyond most project design situations. In addition, it ignores the fact that most small scale entrepreneurs have practical or risk aversion problems which may make this simple model inaccurate.

d. Optimal or Expected Credit Operating Ratios

Many small scale enterprise interventions in credit are based on the notion that small enterprises are discriminated against in the distribution of credit. A method of estimating demand for credit would be to find a measure of the magnitude of this discrimination and assume that the demand would be that amount of credit required to put the small enterprise on equal credit footing with a larger enterprise. The difficulty in this approach lies in defining the measure. Acceptable alternatives have been found in estimating credit operating ratios by sector or product type. A credit operating ratio would be computed either by dividing the value of credit carried by a firm by its value of assets or by its value of production. The first measure would be oriented at the credit worthiness of the firm, the second at the more technical question of the amount of credit required or normally utilized to produce a unit of output. If these ratios are much lower for the target group firms than they are for those firms with freer access to credit, it would indicate that in fact a discrimination exists and that there ought to be a demand approximately equal to the magnitude of difference in the operating ratio. Note that the example of this type of computation presented in Table 10-3 is not for agribusinesses but rather for farms, though the methodology should be the same if applied to agribusiness enterprises. From the table it can be observed that credit per cropped hectare on small farms under 2 hectares is less than 10% of the national average. It can also be seen that the credit operating ratio rises from less than $10 per hectare consistently to over $200 and then fluctuates between $250-400. It might be suggested that $200 should be the expected or minimum suggested level for efficient production in El Salvador based on the observed credit operating ratios. The difference in the actual supply and this expected operating ratio level could be used as an estimate of the latent credit demand on small holdings.

2. Estimating Demand for Technical Assistance and Advisory Services

The process of estimating demand for a service such as technical assistance or advisory services is more difficult than is the case with credit. The first part of the problem is that it is much more difficult for the entrepreneur to sense the direct need and benefit which may come from technical advice. It is therefore possible that negative responses from entrepreneurs if asked about their interest in receiving technical assistance may not be conclusive evidence that they do not need or would not benefit from such advice. While negative responses may not be accurate perceptions, they are indicative of an acceptance problem which may affect the ability of the project to succeed. An alternative approach is to base the estimate on the acceptance and rejection rates of existing technical assistance services. In addition to rejection or acceptance rates, client perceptions about the benefits derived from existing TA services may add realism to the estimates of demand.

Table 10-3
Credit Operating Ratios for Farms, El Salvador, 1971 (US$/Ha.)

Farm Size	Credit per Cropped Ha. (Col./Ha.)	Credit per Cropped Ha. as a % of the National Average
0 to .49 Ha.	7.53 Col./Ha.	4.3
.5 to .99 Ha.	7.78	4.6
1 to 1.99 Ha.	14.25	8.2
2 to 2.99 Ha.	21.31	12.2
3 to 3.99 Ha.	26.48	15.1
4 to 4.99 Ha.	34.99	20.0
5 to 9.99 Ha.	48.10	27.5
10 to 19.99 Ha.	73.24	41.9
20 to 49.99 Ha.	195.21	111.7
50 to 99.99 Ha.	396.82	227.0
100 to 199.99 Ha.	344.25	196.9
200 to 499.99 Ha.	275.45	157.6
500 to 999.99 Ha.	350.05	200.2
1,000 to 2,499 Ha.	237.58	135.9
2,500 Ha. and Over	383.12	219.2
Average for All Farms	174.82	100.0

Source: S. Daines and D. Steen, **Statistical Analysis of the Rural Poor Target Group,** Tables 37 and 39.

An alternative approach would be to attempt to define the specific technical package or set of recommendations which the technical assistance service is intending to carry to the enterprise. A short description of this service could be given to a sample of target group entrepreneurs and they could be asked:

1. How important would such advice be to them?
2. Would they be interested in having a competent technician come to explain the following, or how to operate the following machinery, etc?
3. Would they be willing to pay for such a service?

The results of such a survey could assist not only in estimating the demand for the service, but also in planning the content of the technical assistance effort.

3. Estimating the Demand for Infrastructure Projects to Benefit Agribusiness and Rural Enterprises

If the intended intervention is the establishment of a marketing facility, access roads, improved marketing services or other infrastructure aimed at improving the operating environment for rural enterprises, the estimation of demand may proceed much the same as was outlined in the credit case discussed above. Entrepreneurs may be asked how important they think the new facility is, if they would be willing to participate somehow in the costs of its installation (donate labor, for example) or other question formulations directed at eliciting their perception of the importance and expected use of the facility.

Product demand for the products to be marketed through the facility, to use the road, etc., should be made to provide a basis for project demand estimates. The increased net profitability of participating enterprises might be used as evidence of demand based on the assumption that affected entrepreneurs are profit maximizers and would therefore utilize an added input or service as long as its marginal net revenue exceeds its cost.

Each of the alternative approaches mentioned in the last paragraph attempts to estimate the demand as derived from the benefit caused by the facility and not directly based on the perceptions of those who will use or presumably benefit from the infrastructure. While this may appear to be risky, it should be remembered that infrastructure projects do not depend upon entrepreneurial acceptance in order to be implemented in the same way that technical assistance and credit projects do. In the case of a credit project, if no one wants to borrow, the project cannot even be implemented. It is, of course, true that a project may be implemented and not have the desired final impacts on the welfare of the poor. Yet that final impact question is a question of advisability, not feasibility. Since this section deals with feasibility, it should be noted that fewer problems of entrepreneurial interest and willingness need be addressed in the feasibility stage of project analysis for infrastructure projects; these issues should be intensively analyzed when the project potential impacts are estimated.

D. Comparative Cost Analysis

Even if there is interest in and demand for project inputs, and there appears to be demand for project outputs, there remains the important issue of competitive production from other sources which may invade that demand and prevent project participants from even implementing the interventions contemplated by the project. In order to examine this possibility, some comparative cost analysis needs to be undertaken to establish the feasibility of project productive activities competing with possible other sources of production.

Comparative cost analysis is conducted by an examination of resource costs and resource quantities utilized in the productive process. Possible national and indeed international competitors should be examined to identify their resource costs, and the quantities of those resources required to produce and market the product in question.

If the conclusion is negative, i.e., that the project participants cannot compete on a cost basis with alternative sources of production, there may still be reason to think that the project may under certain unusual conditions be feasible. The first of these conditions is the traditional case of protection or public subsidy. These protective measures may come in the form of trade restrictions, input cost subsidies, or special marketing arrangements.[10.2] There are, however, serious costs which must be considered before such market distortions are indulged in. One must be certain that such interventions are in the long-term best interest of the target group. In many cases the use of such protection measures encourages small scale entrepreneurs into productive activities which later become unprofitable after considerable investment.

In some cases the small scale entrepreneur can price compete by using his labor as a below market price resource. In this situation he can sell a product for a price below that of the competition and still benefit because his opportunity cost for his own family labor is substantially below the actual wage rate paid by competing larger scale enterprises. A simple finding that at current wage rates the small scale entrepreneur cannot compete is not sufficient evidence that the project is not feasible. The market wage may be appropriate for the competing firm labor cost computation, but for the small scale entrepreneur his opportunity cost of family labor should be substituted for the hired wage rate. When comparative costs are computed in this way, a realistic view of competitive feasibility will emerge from the analysis.

10.2/ See J. Bhagwati and V. K. Ramaswami, "Domestic Distortions, Tariffs and the Theory of Optimum Subsidy," *Journal of Political Economy*, 71, No. 1 (February, 1963), pp. 44-50; and J. Bhagwati, V. K. Ramaswami, and T. N. Srinivasan, "Domestic Distortions, Tariffs, and the Theory of Optimum Subsidy: Some Further Results," *Journal of Political Economy*, 77, No. 6 (November/December, 1969), pp. 1005-1010.

CHAPTER ELEVEN: COST BENEFIT ANALYSIS OF AGRIBUSINESS AND RURAL ENTERPRISE PROJECTS

This chapter deals with the process of comparing the benefit potentials (discussed in Chapter Nine) with the costs of undertaking an agribusiness or rural enterprise project.

A. Estimating the Benefits: How Much and for Whom?

The purpose of Chapter Nine was to explore ways of estimating the potential benefit of agribusiness and rural enterprise projects. The most important failing of most cost benefit analyses conducted by or for A.I.D. lies in the inadequate data and method used to estimate the size and probability of expected benefits. It should be remembered that the methodology of cost benefit analysis does not assist in estimating the probable benefit, but only provides a way of comparing that benefit, once known or estimated by other means, with project costs. Little added work is necessary to transform a well developed estimate of project potential benefit into a cost benefit ratio; almost all of the work, effort, time and intellectual energy is consumed in making the original estimate of expected benefit. It is unfortunately true that in most A.I.D. cost benefit analyses, little data and effort have in practice been expended on measurement of the benefit; the time and work have been focused on the arithmetic of cost benefit methodology. While Chapter Nine contains the discussion on how to estimate expected benefit potential of a proposed project, it is worth summarizing the general alternatives discussed there as an introduction to cost benefit analysis.

1. Comparing Results vs. Projecting Probable Causes

In a general sense there are two overall avenues of approach to estimating the probable benefits which would flow from an agribusiness or rural enterprise intervention. The first would be to compare actual with and without situations and measure the final difference in result or benefit to family incomes, health/nutrition and other welfare. The second is to describe the assumed causal mechanism by which final impacts are to be reached and using data (which could range from very reliable and systematically gathered to simple guesses) attempt to estimate the magnitudes of each of these probable causes to the final result.

Each of these approaches has advantages and disadvantages; their accuracy and feasibility depend on different factors. The accuracy and feasibility of the first (with and without comparison) depends on the possibility of making comparisons which satisfactorily isolate the intervention and control other factors which may influence final results. To the degree that such control is possible, this technique is useful.

The accuracy and feasibility of the second technique (projecting the impact of each probable cause chain) depends on our ability to both understand all of the ways the intervention may cause a final result, and ability to predict how individual entrepreneurs in a particular cultural and economic setting will react in each of these

causitive chains. The degree to which the system is simple, if there are only a very few ways in which the intervention can affect final welfare (income, employment, health, etc.) and the degree of confidence in our ability to predict how the enterprise system will react in each of these chains of causation, will determine the usefulness of the "projection" technique.

In the A.I.D. project manager's real world of data and level of understanding, it is obvious that neither of these sets of assumptions hold at a very high level of acceptability. We cannot normally control adequately all of the factors which could cause welfare in a **with and without** comparison, nor is it likely that we understand how enterprises and households operate in diverse cultural and economic situations and how each possible cause will finally effect the complex enterprise and household systems. The A.I.D. manager is left with a choice between approaches which are both questionable. It is difficult for the project planner to make judgements about relative inaccuracy of method and the tendency is therefore to simply reject all methods which require time. The approach most often taken is to simply sum the best official guesses as to expected benefits and spend what little time and money are available on manipulating these **best guesses** inside the internally consistent and easily controllable arithmetic of cost benefit computations. A confused manager can always defend himself by making reference to discussion such as that outlined in the last paragraphs and saying, "even the experts admit that the best methods for estimating benefits are questionable at best; if even the experts disagree on how to do it, it is probably best not to gather data at all."

A better alternative would be to carefully review the relative confidence which A.I.D. and outside analysts have in the factors which determine the accuracy of the two alternative techniques and choose one of these approaches for estimating potential benefits. Table 11-1 should help to structure that review by organizing the questions to be asked. The two analysis alternatives will be termed **comparisons** and **projections.** Definitions are given as follows:

Comparisons: With and without intervention comparisons of existing enterprises and households. The things compared are final welfare indicators such as income, employment, health and nutrition, housing, sanitation and education.

Projections: With and without intervention accounting projections of what is expected to happen to each different probable cause resulting from the intervention. The attempt is to show the expected magnitudes and connection with the project intervention of welfare impacts. Each important probable effect must be estimated.

These methods are the subject of detailed description in Chapter Eight. The **comparison** method is described in Section C-1 (Comparisons of Enterprises With and Without Project Intervention). The **projections** method is described in Section C-2 (Accounting Projections).

The answer to these two method review questions will vary from situation to situation depending on many factors, type of intervention, cultural diversity inside the target group, availability of data of different types, and many others. Yet the questions themselves are not likely to be answered with equal confidence. It is interesting to note that the two methods are not equally flexible in the kind of data required. The **comparisons** method requires field enterprise and household data from the target group; there is little possibility in conducting this type of analysis based on expert opinions or judgement. The **projections** method is much more flexible; it can be conducted at almost any point along the continuum from extensive field data to office best guesses, and while the results may vary tremendously in quality depending on the reliability of the data source, the results do not vary in **form.** By

Table 11-1
Review of Methods for Estimating Benefits of Agribusiness and Rural Enterprise Project Interventions

The Basic Question is Which Can We Do Better?	Better Method to Choose
1. Identify the ways this set of project interventions will change enterprises and households, how they will react to these changes and how they will in sum effect household income, employment, health, nutrition, housing and sanitation	Projections
2. Identify households and enterprises with and without the kind of interventions proposed but from similar cultural and economic situations	Comparisons

looking at the final analytical result one cannot tell in the **projections** method a careful and reliable estimate and a "seat of the pants" guess. It is probably the result of this flexibility and not of a systematic review of the alternative which has led almost all A.I.D. project analysts to choose **projections** as the method for estimating benefits. Based on a small sample of about twenty rural A.I.D. projects with which the author has been involved, almost two-thirds were in situations where the A.I.D. mission and its analysts could answer question 2 in the review table with more confidence than 1 and should therefore have chosen **comparisons** as the most appropriate method. There is also the additional concern that comparisons may indicate that the intervention does not create (or at least did not in the comparison test) sufficient benefits to justify the costs of the project. In the projections case, simple adjustments in the projections themselves can easily improve the expected benefits to a sufficient level to justify costs.

2. *Benefits, For Whom?*

Traditional cost benefit analysis was concerned with total benefits without focus on any special group in the economy. The Congressional Mandate has made it clear that A.I.D. projects must focus on benefits accruing to the "poor majority." Cost benefit analysis conducted for the purpose of enlightening project choice for A.I.D. investment should explicitly focus on the poor who benefit. Integrating considerations of poor beneficiaries into cost benefit analysis is not easy because it departs immediately from one of the attractive properties of the benefit/cost ratio; i.e., that if properly calculated, projects with ratios more than 1 are acceptable investments and those with ratios less than 1 do not have benefits to justify their costs. If only a part of the benefits are included in the numerator of the ratio there is no reason to think that ratios above and below unity (1) have the same significance. As comparative tools the ratios would retain their utility if adjusted to account only for income benefits to the poor, but the significance of the absolute ratio and its position above or below 1 would disappear.

For direct benefits and reasonably immediate indirect benefits it may be possible to keep accounting track of the income level of the beneficiaries so that they can be classified as poor or nonpoor. For truly indirect benefits it is virtually impossible without extensive "input-output" models to make such a distinction. The poor who benefit from agribusiness and rural enterprise projects in a reasonably direct fashion fall into the following groups:[11.1]

11.1/ An alternative approach to groupings is taken in the UNIDO cost benefit guide. UNIDO, *Guide to Practical Project Appraisal: Social Benefit-Cost Analysis in Developing Countries* (New York, 1978), pp. 53-54.

"The groups that lose and gain income because of the project may be defined in many ways. *Theoretically a different weight should be applied to each level of income. Furthermore, distinctions should usually be made between*

—Poor entrepreneurs or owners of enterprises (benefits come in the form of increased profits, returns to invested capital, or returns to management and labor.

—Poor wage or salary earning laborers who work in affected enterprises (benefits come from increased employment or increased wage rates).

—Poor farm families who own and operate farms supplying raw material to the affected enterprises (benefits come as increased farm profits, return to invested capital or returns to management and labor.

—Poor farm laborers who work for wages on farms (poor or nonpoor) supplying raw material to the affected enterprises (benefits come in increased employment or wage rates).

If it is possible to measure the proportion of each affected group who lies below the poverty line it will be possible to use one of the three methods described below to make the cost benefit ratios reflect a direct concern for income to the poor majority.

a. Include Only Benefits to the Poor in the Numerator

The first approach is to enter benefits in the numerator only if they are benefits to the poor. Income benefits to households above the poverty line would be simply ignored. This would result in a ratio of income benefits to the rural poor, divided by total project costs. Using such a ratio, projects would be ranked according to how much income to the poor was produced per unit cost. As a comparative device to evaluate alternative projects aimed at benefiting the poor, ratios so computed should provide a very useful result.

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government and private, rural and urban, and local and foreign, and often even within these groups For example, the allocation of benefits between small and big businessmen may be more significant than their division between businessmen and the external sector The same is true for small and large farmers. In practice, income-distribution analysis is often limited to two groups: the poor, whatever their occupation, and everyone else The example in this chapter takes a slightly more disaggregated approach, however, indicating in table 12 gains and losses by the:

Project
Other private business
Government
Workers
Consumers
External sector

Many other equally valid groupings are possible, depending on the degree of sophistication desired in the analysis It should be apparent that the project in this example is assumed to be privately owned; however, the same method of measuring income flow works equally well regardless of the project's ownership. If, for example, the project is in the public sector, the weights on income going to the project will be adjusted accordingly

If a project will have a significant impact on the relative income level of a group over time so that the premium attached to income enjoyed by this group will change, it may be desirable to set up two subgroups, allocating income early in the project's life to the first group when the beneficiaries are still relatively poor, and to the second later on when they become relatively better off This procedure may be of particular importance in rural development projects, which often bring about a significant improvement in the standard of living of the participants

A fundamental assumption made in the method presented here is that there is a gainer for every loser. If unskilled workers gain because the market wage exceeds the shadow wage, for example, the project loses because it has to pay more than the economic value of the workers Similarly, if the consumers lose because they pay more for the tractor than its economic value, the project gains by a like amount A further assumption is made that the project is a loser if the economic net present value of the project is distributed to others, for, without the project, the surplus would not have been generated.

The assumption of gains balancing losses has an important practical implication; it means that double-entry bookkeeping can be used to keep track of the income flows. Each item must be entered twice in the income-flow statement .. once as a loss and once as a gain. In the end the analyst can easily check the consistency of his work; everything should sum to zero

So far the emphasis has implicitly been on income flows resulting from an allocation of the economic net present value of the project. Another type of flow is entirely possible, however, the redistributive flow, one that takes away something another group already has rather than simply allocating something new.

Income transfers of this type from one group to another may be generated by two situations:

(a) Receipts A resource is paid less than its economic value (e.g. capital is borrowed from the government at 4 per cent when the oppostunity cost of capital is 10 per cent);

(b) Expenditures. A resource is purchased at more than its economic value (e.g. consumer pays Rs 2,000 for a refrigerator worth only Rs 1,000 at border prices).

Since there is a loss for every gain, there must be a redistributive loss corresponding to every redistributive gain (e.g. the government's loss when the project gains by paying only 4 per cent for its capital). A project may therefore generate income flows even though it has a zero or negative net present value "

b. Include Income to All Households in the Numerator

The second approach is to include income to all households (poor and nonpoor) in the numerator, but weight the income of each income strata differently to reflect a preference for income to the poor. For example, added income from the project earned by families with preproject incomes over US$1.000 per capita per year could be given a weight of 0.1, families from $150-999 per capita a weight of .5 and target group families under $150 a weight of 1. Each income benefit would then be multiplied by one of their weights depending on the income of the family to whom the income accrued before the benefit was added into the cost benefit numerator. Many different weighting schemes could be envisioned, each with its explicit relative valuation of the income to different income classes.[11.2] The advantage of this approach is that it avoids the intellectually unsettling notion of a fixed line dividing rich and poor; it allows for a much more flexible valuation of relative poverty. The disadvantage of the weighting approach is that there is little concrete basis for choosing the weights themselves.

c. Separate Calculation of Benefits to the Poor

The third approach is to calculate the benefit/cost ratios including all income to any household, and then estimate separately the proportion of income which will result to each income stratum. This would result in a per-

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11.2/ The weighting system advocated by UNIDO is as follows:

Estimation of distribution weights

The determination of the adjustment factors or weights to be placed on income going to different groups is by no means a mechanical process based on empirical evidence; it depends very heavily on political judgement The *Guidelines* suggests that weights be determined through an iterative process between the analysts 'at the bottom', and the politicians or planners 'at the top' Using the preferences revealed by the planners for projects with different net present values and distribution impacts, the analysts can determine the weights these planners implicitly assign when they accept some projects and reject others

Assume, for example, that the analysts first present a project with a negative net present value of Rs 1 million as calculated in stage three of the UNIDO analysis (i e before consideration is given to income distribution among contemporaries). Two income groups have been identified: People with income less than Rs 100 per month and the rest of the economy. Assume also that distributional analysis shows that the project over its life would generate incremental income flows to the low-income group of Rs 5 million in net present-value terms If the planners accept the project, it implies that they place a premium of at least 20 per cent on income going to the poor, for 20 per cent of Rs 5 million is Rs 1 million, which, when added to the negative net present value of Rs 1 million, will bring the net present value of the project to zero, the marginally acceptable level If the planners reject this project, but accept others requiring at least a 15 per cent premium on income going to the poor, the project analysts know that the switching value of the premium lies somewhere between 15 and 20 per cent Provided that the planners are consistent over time and that all other non-quantified factors are equal, a usable weight to be placed on income distribution can be derived by this process ..

This procedure for determining weights, and thus adjustment factors, for income distribution works well if only two groups are involved If more than two are involved, however, this 'bottom-up' switching-value procedure becomes unworkable. The number of unknown weights becomes so great that the analysts at the bottom will never be able to determine from the judgements of the planners at the top what combination of weights they actually placed on income to the various groups In such instances, a slightly more sophisticated method is needed, which, by moving the analysis back one level to focus on a single factor that determines the income-distribution weights, reduces the number of unknowns and makes the system amenable to solution with the 'bottom-up' technique

This single factor is the elasticity of the marginal utility of income, or, in simple terms, the percentage by which the social value placed on additional income falls with a 1 per cent rise in income For example, if the value of this indicator is taken as zero, additional income at all levels is equally valuable from a social point of view If the value is 1.0, a 1 per cent increase in income of a person earning Rs 100 per year is just as socially valuable as a 1 per cent increase in the income of a person earning Rs 1,000 or Rs 10,000 per year. This would imply a weight of 1/10 at the Rs 1,000 level and of 1/100 at the Rs 10,000 level if the weight at the Rs 100 level is taken as 1.0. With this approach, the sensitivity analysis in the 'bottom-up' procedure focuses on the elasticity of the marginal utility of income. Consistent sets of weights are derived based on alternative values for *n* and these sets, rather than individual weights, become the basis of the sensitivity testing. It is important to underline once more that *n* reflects public or social judgements; the private individual is likely to have quite a different view about the value of any additional income he receives.

Before income-distribution weights can be determined, some point on the income scale must be specified to which other incomes can be compared, a point where the weight is 1 0. This point becomes the *numéraire* level, and all incomes received at other levels have to be adjusted to their equivalent value at this level. The section of chapter III on the *numéraire* suggested assigning a value of 1 0 to income at the base level of consumption, the level of *per capita* consumption at which additional income going to a private individual is considered as valuable as income going to the government Theoretically, the determination of the base level of consumption involves a detailed analysis of the value of government income and of income at different levels. *In practice*, however, the base level of consumption may be estimated by reference to the level of income at which people are neither taxed, as are those with more than a certain amount of income, nor subsidized, as are those who receive welfare cheques, food subsidies, and the like, because their income is below a given cut-off level.

centage distribution of income by income strata which could be used as a separate consideration for project selection.

B Costs in Cost/Benefit Analysis

The denominator in benefit cost ratios is considerably less troublesome than the numerator to obtain, except for a few adjustments the cost side of the ledger can be generated from existing data. The adjustments required are discussed in detail in later sections of this chapter and need not be examined here. Costs are the sum of project investments, added costs to entrepreneurs, and indirect costs caused outside enterprises involved but not paid for out of project revenues.

C. Time Horizon and Over Time Projections

Time is a vital factor in benefit cost analysis; it is therefore important that time related estimates and choices be made with some care. There are four principal time related issues in cost benefit analysis of agribusiness and rural enterprise projects—first the selection of a time horizon or accounting period for counting project costs and benefits; secondly the estimation of start-up times, lags, and repayment periods; thirdly, the choice of a discount rate; and lastly the choice of social discount rates.

1. Selecting a Time Horizon for a Project Accounting Period

Benefits from a successful agribusiness or rural enterprise project should continue on in some form almost without end; costs will continue to be present in direct and indirect forms for at least a generation or two. It might appear that the time horizon for accounting for benefits and costs ought to be likewise very long. Three important reasons make such long accounting periods inadvisable or unnecessary. First, discount rates used in all cost benefit analyses, especially those over 10%, imply an insensitivity to long run impacts. Even if it were possible to project the benefits which would result from the intervention thirty to fifty years hence with some accuracy, benefits occurring so far away in time would be reduced to insignificance by the simple arithmetic operation of the discount rate. At a 15% discount rate, a dollar of benefit thirty years from now is worth only one cent in the numerator of the benefit/cost ratio. The second reason for choosing shorter time periods is the difficulty in making reliable projections far into a future whose characteristics we obviously have little information on. The third reason for choosing shorter time horizons is that most agribusiness and rural enterprise projects usually put in place some set of inputs, equipment, plant, or technical assistance system which has a useful life and that useful life makes a natural time period in which to consider the costs and with some stretch in concept, also the benefits of the project. At the end of that period if there is little hope that benefits will have had a chance to mature, then two of these useful life periods may be taken as the appropriate time horizon for project accounting of benefits or costs. If the intervention is to install a processing plant, a marketing facility or introduce improved machinery to rural enterprises, the useful life of those installations is a convenient and appropriate accounting period. Where no physical installation is contemplated, as in the case of an institution building project for improved research or technical assistance, it is more appropriate to choose a time horizon during which final welfare benefits are thought to have

matured. Since costs in these cases are essentially annual in nature, no physical installations are likely to be involved which would be amortized over a useful life, there are less natural points to assist in choosing the appropriate accounting period.

2. *Estimating Start-up Times, Lags, Etc.*

Another important time-related problem in cost benefit analysis is the estimation of time lags in the project costs and benefits. Because of the operation of the discount rate, the point in time at which benefits and costs occur will affect fundamentally how the ratios turn out. It takes time to get a project moving, disbursements take time, there are inevitable lags in construction, installation, etc. Good cost benefit analysis should allow for much of this realistically expected delay in the cost benefit projections. Likewise, benefits will not occur instantaneously; it will take time for enterprises to accept project interventions and make the necessary adjustments before benefits will be forthcoming. Credit projects aimed at expanding production without technological change have perhaps the least lags, though projecting disbursements may still involve time phased projections.

3. *Choosing a Discount Rate*

In order to put costs and benefits which occur at different times on equal footing, a discount rate is used in cost benefit analysis. The discount rate chosen will have an important impact on the final ratios and it is therefore important to understand the basis on which one is to be chosen. Different projects will get different scores on the cost benefit ratios, both absolutely and relatively using different discount rates. A high discount rate will not simply reduce the ratios of all competing projects evenly, it may also cause their relative position to change. A project which at a lower discount rate had the most attractive benefit cost ratio among the alternatives may now become the least attractive using a higher discount rate.

Higher discount rates tend to favor those projects with shorter start-up times and earlier benefits, lower discount rates favor those with larger benefits but further away in time. Two concepts may be used to select a discount rate. First, a time horizon criteria which focuses on the length of time for which a planner or project designer wishes to observe benefits. The second concept is one of the opportunity cost of capital. The opportunity cost of capital uses a market rate of capital and is the commonest rate used in A.I.D. cost benefit analysis. Using the time horizon of the planner, the length of time he wishes to include benefits results in what is normally termed a social discount rate. The opportunity cost of capital is usually taken to be the average interest rate which a relatively riskless investment would earn in the country where the project is to be realized. A social discount rate is usually the product of a host country planning office policy, though some countries do not have one which can be used for analytical purposes. Most social discount rates vary from 3-6%.

D. *Computation of the Basic Cost Benefit Ratios*

Three major computations are normally conducted for cost benefit analysis and should be computed for agribusiness and rural enterprise projects, a present value for costs and benefits (PV), a benefit/cost ratio (BCR), and an internal rate of return (IRR). The project analyst should not use this manual as a guide to the arithmetic of

computation; the examples presented below are not explained in sufficient detail, but are presented to give the project planner an idea of the general methodological process which leads to the ratios.[11.3]

1. *Present Value of Benefits and Costs*

Table 11-2 illustrates the calculation of present values of benefits and costs using a 15% discount rate for a rural enterprise project in Guatemala. If a benefit or a cost occurs in the future it is worth less than if it occurred today if it is a benefit, and is less costly than if it occurred today if it is a cost. For example, the total incremental value of project output in Table 11-2 would be $7,333 for the first year, and $11,112 for each of fourteen years; this total sum is $162,901. This is referred to as the undiscounted value of benefits or output. Since much of that benefit occurs in the future it is worth less than if it took place today; the rate at which we reduce future values so that they are comparable in terms of today is the discount rate, in the example 15%. Discounted (reduced) 15% each year the value today of $162,901 is $54,673 or less than one third. This discounted value is called the net present value of benefits. Costs are likewise discounted to their present value; in the example shown in Table 11-2, the present value of costs is $41,746. The net present value[11.4] of the project is equal to the present value of benefits ($54,678) minus the present value of costs ($41,746) which equals $12,932.

Table 11-2
Present Value and Benefit/Cost Ratios
Rural Small Scale Enterprises in Guatemala, 1978

	Year 1	Years 2-15	Present Value at 15% Discount Rate	Benefit/Cost Ratio
Incremental Project Output ($000)	$7,333	$11,112	$54,678	
Incremental Project Costs				
1. Hired Labor[a]	462	666		1.305
2. Family Labor[a]	1,046	1,396		
3. Other Annual Costs	5,514	5,514		
4. Investment	3,275	–		
Total Incremental Costs	$10,298	$7,576	$41,746	

Source: S. Daines computation based on 1978 Rural Enterprise Survey by S. Daines, G. Smith, Ministry of Agriculture and BANDESA.

[a]Family and hired labor are valued at 42% of market wage to reflect the opportunity cost of labor estimated by the average employment rate in rural Guatemala.

11.3/ There is a multitude of literature on cost/benefit analysis, and a number of "manuals," of which some of the better known for use in social cost/benefit analysis in developing countries are: United Nations Industrial Development Organization, *Guidelines for Project Evaluation* (New York: United Nations, 1972), written by professors Partha Dasgupta, Stephen Marglin, and Amartya Sen, whose approach has been condensed, updated, and geared to the practitioner by J. R. Hanson in *Guide to Practical Project Appraisal, Social Benefit-Cost Analysis in Developing Countries* (New York: United Nations, 1978); I. M. D. Little and J. A. Mirrless, *Project Appraisal and Planning for Developing Countries* (London: Heinemann Educational Books, 1974), which is a revision of their seminal OECD manual entitled *Manual of Industrial Project Analysis in Developing Countries* (Paris: OECD, 1969). A primer of wide use in Latin America is E. Fontaine, *Evaluacion social de proyecto* (Santiago: Universidad Catholica de Chile, 1975).

11.4/ In its most simple expression, the net present value (NPV) of the costs (C) and benefits (B) with a chosen rate of discount (r) for each year (t) over period n, will be:

$$NPV = \sum_{t=0}^{n} \frac{(B_t - C_t)}{(1+r)^t}$$

2. *Benefit Cost Ratio (BCR)*

The benefit cost ratio is simply the present value of benefits divided by the present value of costs. In the example it is $54,678 divided by $41,746 = 1.30.

3. *Internal Rate of Return*

The internal rate of return approaches the issue of a discount rate from the opposite side, and asks what the discount rate would be at which the **net present value** of the project would be equal to zero. The IRR is a measure of the break-even discount rate at which the project is justified as an investment. Where only benefits to the poor have been included in the numerator there are conceptual problems with the IRR since there is no longer any significance to a BCR of 1.0 and the IRR implies a BCR of 1.0.

If the IRR is lower than the market opportunity cost of capital, then the project would be inadvisable. Table 11-3 presents a sensitivity analysis (an analysis using different assumptions) of the IRR for the Guatemala Rural Enterprise Project. The IRR is computed by successively computing the net present value using different discount rates in a trial and error search for the discount rate at which the net present value = zero.

Table 11-3
Internal Rate of Return Analysis
Rural Enterprise Project in Guatemala, 1978

	Internal Rate of Return
Alternative 1 Assumptions 1. Labor at market wage 2. No start-up period	25.0%
Alternative 2 Assumptions 1. Labor at Shadow Wage of 42% 2. Two-year start-up period	59.6%
Alternative 3 Assumptions 1. Hired labor at shadow wage of 42% 2. Family labor at shadow wage zero 3. Two-year start-up period 4. Tech. asst. at 8% of loan	64.8%

Source: S. Daines computation based on 1978 Rural Enterprise Survey by S. Daines, G. Smith, Ministry of Agriculture and BANDESA.

E. *Shadow Pricing Project Labor*

Underutilization of unskilled labor is characteristic of most developing economies. In many areas, rural wages are not flexible enough to fall in order to take account of the unemployment. In many cases minimum wage laws are controlling, and social and cultural influences force an inflexibility on wages which results in their not being freely adjusting reflections of the supply and demand for unskilled labor.

A project should not be charged for the full cost of the labor it utilizes, since society does not really forego that value of alternative production since a large part of the labor is or could be drawn from the unemployed. It

should be remembered that in some cases seasonal peaks of labor demand imply that even though labor may be unemployed much of the year, if the project will need labor during the peak harvest period it may be that the market wage is an accurate representation of the opportunity cost.

The computation of the shadow wage to be used for valuation of project labor may be accomplished in many ways. Perhaps the most practical is to use the unemployment rate as the weighting factor; that is, if the general unemployment rate among the workers who would be drawn into project labor is 50%, then the shadow wage ought to be 50% of the market wage. The theory for this calculation is that on the average only 50% of the labor diverted to the project will be employed and hence no more than 50% of alternative production, measured by the wage rate, will be foregone.

Using a shadow wage increases the benefit cost ratio of project alternatives in direct proportion to their labor intensity and it therefore automatically biases project choice in the proper direction of favoring those projects in unemployed situations which productively utilize more labor. Table 11-2 values project labor at 42% of the market wage.

An alternative method for computation of agribusiness shadow wages is drawn from a set of guidelines circulated in draft to A.I.D. missions in the Latin America Bureau. This method is summarized below. To use this method for calculating shadow wage rates, three assumptions are required:

1) The probability that workers for the project will be drawn from the ranks of the unemployed will be higher the higher the level of unemployment.
2) The market wage can be accepted as approximating the worth of previously employed persons.
3) The cost of a subsistence diet is a fair approximation of the economic worth of a previously unemployed and unskilled person.

The shadow wage is then a weighted sum of the market wage rate and the cost of a subsistence diet, the weights being the probability that workers will have been previously employed (in the case of the market wage rate) and unemployed (in the case of the cost of a subsistence diet).[11.5]

F. Shadow Pricing Project Inputs and Outputs

Aside from labor there may be good reasons for altering the prices on other items which enter as either project inputs or outputs. A few specific cases will be given below to illustrate the general idea. The basis on which market prices are rejected as a way of valuing inputs or outputs for an agribusiness or rural enterprise project is that the market price does not reflect the true value or cost of the item. Three examples are given below: first, agricultural produce which in turn requires labor to produce; second, the case of imported goods; and thirdly, products which have subsidies or price supports.

11.5/ See Appendix B of Suggested Guidelines for Measuring Backward Linkage in Agroindustrial Projects, AID LA/DR, 1977.

On social pricing of lebor, see A. C. Harberger, "On Measuring the Social Opportunities Cost of Labour," *International Labour Review*, 103, No. 6 (June, 1971), pp. 559-579; end D. Mazumdar, "The Rural-Urban Wage Gap, Migration, and the Shadow Wage," *Oxford Economic Papers*, 28, No. 3 (November, 1976), pp. 406-425, and included references for further issues on this subject, in addition to the manuals previously noted.

1. *Farm Produce Consumed by the Agribusiness*

The discussions in Chapters Two and Four discuss the importance of the backward linkage of agribusiness and rural enterprise projects on farm production. Increasing the demand for agricultural products will increase employment opportunities and increase small farm income where products are supplied by small farmers. This desirable backward effect may be treated in two ways: first, the incremental gross income of the poor farmers may be included in the numerator as indirect benefit, and the costs of that incremental production may be included in the denominator, with the labor costs properly shadow priced as was discussed above. The second method is to shadow price the raw material input when it enters as a cost item in the denominator. Shadow pricing the raw farm input may be done by reducing the market price of these products by the labor shadow price described in Section E above. For example, if the assumed unemployment rate is 40%, the shadow wage may be estimated at 60% of the market. If $1,000,000 of agricultural product at market prices is to be purchased by the project, and if the labor cost of the production of that raw product was $400,000, then the market value might be reduced from $1,000,000 to $840,000 (the labor cost would be reduced from $400,000 to $240,000, or 60%, which would reduce the total cost by $160,000).

A difficulty with this approach is that agricultural production will usually demand added labor during the normal peak times in the region's employment cycle, and it may be that there is almost no unemployment during those peaks. Careful consideration must be given to the timing of the labor requirements of the products to be included in the project.

2. *Shadow Pricing Imported Goods and Subsidized Inputs*

It is often true that public policy may have resulted in making imported capital goods cheap relative to other goods. It is important to correct this distortion when conducting cost benefit analysis in order that the true cost of these goods is reflected. An overvalued exchange rate may cause such a distortion for all imported goods, and specific types of capital goods may be the subject of particular regulations which result in an import subsidy. A more realistic exchange rate (shadow price of foreign exchange) will usually be calculated by the planning office of the central bank or other central planning unit in the host country which can be used for this adjustment.

Certain domestic products used as project inputs may also be subsidized such that their prices are not indicative of their true economic worth. It may be that price controls or subsidies may be applied to flour to keep the price down for urban poor consumers. A baking or pasta plant utilizing this subsidized input should be charged with a more realistic shadow price to reflect the real costs of the goods in question. It is not always easy to identify those goods which should be shadow priced, but a review ought to be made of all major inputs utilized to see if they are distorted in any important way by public policy or regulations.[11.6]

11.6/ Papers from several symposia are of relevance for this and the next section regarding pricing of project outputs. See the papers of a number of authors in the symposium on shadow exchange rates in the *Oxford Economic Papers*, 26, No. 2 (July, 1974), pp 147-206; and a symposium on domestic resource costs and effective protection rates in the *Journal of Political Economy*, 80, No 1 (January/February, 1972). See also P. Dasgupta and J. E. Stiglitz, "Benefit-Cost Analysis and Trade Policies," *Journal of Political Economy*, 82, No. 1 (January/February, 1974), pp 1-33; and T. N. Srinivasan and J. N. Bhagwati, "Shadow Prices for Project Selection in the Presence of Distortions: Effective Rates of Protection and Domestic Resource Costs," *Journal of Political Economy*, 86, No. 1 (January/February, 1978), pp. 97-116.

3. *Shadow Pricing Project Outputs*

Many agribusiness enterprises are involved with products destined for export, or competing with imports. These two cases present problems for cost benefit analysis because of the potential for price distortions which affect the measurement of the value of project outputs.

a. In the case that the output of the project is to be exported, it is not uncommon for the country to provide a set of direct and indirect incentives. These incentives can be in the form of direct subsidies on the price of the output which are given by allowing the exporters to access a more favorable exchange rate for their exchange transactions. The subsidy may be indirect in the sense that they may be given soft loans, preferentially exempted from certain taxes, given special transport rebates from public railways, reduced costs at public ports, etc. All of these measures may be beneficial and wisely designed, yet their impact on cost benefit analysis is to underestimate the costs and overvalue the product of the project.[11.7] Most of these subsidies can be adjusted by properly shadow pricing the value of the output, reducing the actual price received by the value of the subsidies.

b. A second important problem may be that the price of the output is not subsidized, but competing imports are charged tarrifs to protect the local agribusiness enterprise. When projecting project potential the issue of competing imports and comparative costs is discussed and it is probably more appropriate to deal with this problem at that stage than in the arithmetic of cost benefit analysis. There is a simple way to include such a consideration in the calculation of the ratios by simply using the lower international price rather than the internal protected price to value the output of the project.

G. *Estimating Indirect Benefits and Costs*

Where the project is such that backward linkage to small farms and by implication members of the target group is assured by the integration of these producers into the project, then the problem of estimating indirect benefits to these producers does not arise since they should be simply included in the accounting as if they were direct beneficiaries. This implies that all of their incremental costs as well as benefits must be included.

In the event that the raw produce for the agribusiness or rural enterprise is purchased without preference to small farms it will be necessary to estimate this backward link in a different way. The major difficulty arises in attempting to identify the added costs as well as benefits which are caused to indirect beneficiaries. The practical result of this problem is that only in rare cases will adequate data be available to integrate indirect beneficiaries into the ratios. A preferable approach is to estimate the reach of the project indirect benefits in a separate analysis. If an adequate input-output model exists for the country in question, useful totals may be estimated for indirect benefits throughout the economy. Since these models are rare, most agribusiness projects must be analyzed with only the crudest estimates of backward and forward linkage impacts beyond the direct producers of raw material inputs. For examples of the measurement of backward linkage to small farmers, see discussion in Chapter Four.

A description of indirect impact estimates possible when input-output coefficients are used is contained in Tables 11-4 and 11-5.[11.8]

11.7/ It was found in Pakistan, for example, that the cost of using electric pumps to deliver an acre-foot of water was 50% more when done by diesel pumps rather than electric pumps. When, however, the alternative systems were costed out on the basis of social prices, it was found that the social cost of diesel pumps was a third less than that of electric pumps. Child and Kaneda, *op. cit.*, pp. 259-260.

11.8/ These estimates were made for the Guatemala Rural Enterprise Project (see S. Daines et al., Guatemala Rural Enterprises, Agency for International Development, 1978, p. 12.

Table 11-4
Indirect Income Impact of the Guatemala Rural Enterprise Project on Poor Income Households

Sector	Additional Output Caused by Project	$ of Income[a] to Poor Households per $ Output	Direct Income to Poor Households	Indirect Income to Poor Households	Total Income to Poor Households
Wood Prod.	$1,210	$0.678	$497	$323	$820
Textiles	1,360	1.068	672	780	1,453
Leather Misc.	1,380	1.019	816	590	1,406
Baking/Foods	2,540	0.909	695	1,615	2,310
Commercial	1,800	1,082	693	1,251	1,944
Small Scale	$8,290		$2,768	$4,559	$7,933

Source: S. Daines computation based on 1978 Rural Enterprise Survey by S. Daines, G. Smith, Ministry of Agriculture and BANDESA and sources noted in (a) below.

[a]The multipliers or coefficients for target group direct and indirect income impacts are taken from S. Daines, Colombia Agriculture Sector Analysis, Washington, D.C., 1972, p. 107. Individual sectors were matched with similar Colombian sectors as follows: Wood Products with "Wood," Textiles with "Clothing and Textiles," Leather with "Leather," Baking and Food Products with the simple average of "Bread," "Other Foods," and "Fruit and Vegetables," commercial enterprises were matched with the pro-rated direct to indirect coefficient for all rural marketing.

Table 11-5
On-Farm Employment Impact of the Guatemala Rural Enterprise Project

Sector	Farm Employment[a] Multiplier ($ of Unskilled Farm Labor per $ of Added Enterprise Output)	Person-Years of Additional On-Farm Labor Created by Rural Enterprise Project
Wood Products	$0.059	211
Textiles	0.090	363
Leather	0.092	378
Baking/Food	0.141	1,066
Commercial	0.075	402
Small Scale		2,420
Medium Scale	0.048	339
Project Total		2,759

[a]Employment multipliers based on S. Daines, **Colombia Agriculture Sector Analysis**, Washington, D.C., 1972, pp. 80-84. Gross output levels based on loan volume and 1978 Rural Enterprise Survey by S. Daines, G. Smith, Ministry of Agriculture and BANDESA.

CHAPTER TWELVE: ALTERNATIVES FOR DATA GATHERING BY DATA TYPE

Part III is divided into three chapters. The first, Chapter 12, elaborates a typology of data utilized in the various stages of agribusiness and rural enterprise project analysis and an inventory of the alternative data sources which can provide the necessary data. A considerable description of data and data gathering methods is dispersed throughout the other chapters; the role of Chapter 12 is to gather these disperse data uses into a limited number of general types and indicate alternative sources. There will be inevitable duplication of discussion since there is an overlap between the treatment of data requirements under the project analysis category in which the data are used and the data gathering chapters.

The attempt of this section is to gather data by the possible source rather than by the possible use of those data in different stages of project analysis.

Chapter 12 is not the locus of detailed discussion of the techniques and methodology of complex data gathering alternatives; these treatments will be found in Chapters 13 and 14. All Chapter 12 attempts is to inventory the data types needed and the alternative sources.

A. Sector Wide Data

1. General Economic Trends

At various stages in project analysis, general economic data will be required. The largest use of these types of data is at the CDSS and Sector Assessment stage. These types of data exist in secondary sources such as the list given below in Table 12-1. Given the cost and time implications, it would be impossible to generate these data if they did not exist in secondary sources, and it would even be prohibitive to process original data which may exist. A field mission is therefore dependent on the existence of secondary documents in which these data have already been processed and appear in final form.

Table 12-1
General Economic Data Types and Sources

Data	Secondary Data Sources
GDP, GNP, Trade Balance Agricultural and Industrial Output	Central Bank Reports, UN Regional Statistics, National Statistical Office, National Accounts Industrial Census, Agriculture Census
International Trade and Foreign Exchange Balance International Borrowing	IMF International Financial Statistics, Central Bank Reports, National Accounts
Population, Education, Housing, Health	Population Census, and Ministry Documents for Various Topics

2. *Sector Profile Data and Sector Trends*

Chapter 6 contains a description of the types and sources of data for sector profiles. That discussion concludes that industrial and commercial census efforts provide the best possible source of profile data. Institutional files and records (industrial associations, credit institutions with enterprise portfolios, etc.) and existing surveys of industrial or small scale enterprise activities may be possible sources.

B. Target Group Enterprise Data

Many data types are required which originate in target group enterprises. These data types constitute the heart of adequate project analysis. Possible sources are inventoried below.

1. *Enterprise Sample Surveys*

Since the interest of project analysis is to have a representative view of target group enterprises, a mission funded or initiated sample survey of the target enterprises is probably the most appropriate data source. It is unlikely that such an effort will have taken place at host country initiative, and it is difficult to get the necessary depth and statistical breadth from the data sources which are listed below. A full discussion of this data source alternative is given in Chapter 14.

2. *Case Studies/Firm Level Micro Analysis*

Case studies or in-depth firm level micro analysis provides a viable alternative to sample surveys. These studies may be conducted on a limited number of enterprises and present a much reduced organizational burden on the entity conducting the study. Some appropriate studies of this type may already exist, yet it is unlikely that these studies contain the particular focus needed for A.I.D. project design. The principal disadvantage of these studies is that they can be conducted only by highly trained personnel (economists, sociologists, industrial engineers, anthropologists, etc.), whereas sample surveys due to their size usually are conducted with trained but non-expert personnel. The case study can contain a depth and richness in concept and coverage impossible in sample surveys, and their data quality is usually much higher. If properly designed to test project hypotheses, they can provide a remarkably complete set of data for project design. The weakness of case studies is of course that their representativeness is impossible to estimate. If target group enterprises are very homogenous, the reliability of case studies should be very high. If there are identifiable types of enterprises which are different, yet have very little variation inside the type, the case study approach is very appropriate since a few cases can provide representative information on a large number of enterprises. The difficulty is that in most A.I.D. project cases the homogeneity of the target group enterprises is not known; it is usually not even known how the different enterprise types are distributed in the target population. The case study in many cases is unable to answer these preliminary questions of distribution of enterprise types, incidence of credit use, income importance, etc. What the case study does very well is investigate enterprise level issues in depth which are of importance to project analysis.

Case studies and micro analyses are much more manageable data gathering efforts than enterprise sample surveys because there are fewer people involved, less geographic dispersion and simply less logistical support required. That is not to say that they are less costly. The training level of manpower utilized is usually so much higher in case study efforts that the added cost of that manpower compared with the relatively low cost of interviewers for sample surveys results in similar costs in the two efforts. A case study using economists, sociologists or other experts based on 10-20 enterprises will ordinarily cost roughly the same as a sample survey of 500-1,000 enterprises. What is gained in depth and richness in the case study is traded for the statistical breadth and reliability of the sample survey; the costs will be roughly the same.

3. Institutional Files and Records

A third possible source of enterprise level information may be the files and records of institutions serving agribusinesses, agroindustries and rural enterprises. Industrial associations, rural cooperatives, banks and public credit institutions are the most probable sources. Credit applications indicating enterprise balance sheet information is a common example. Coffee and certain other producer associations commonly maintain rather sophisticated accounting information on their member agroindustrial and food processing enterprises. While these sources ought to be reviewed, it is unlikely that they will have either the necessary product breadth or conceptual coverage necessary to conduct useful A.I.D. project analysis. In the event that the A.I.D. project is product focused, for example on coffee processing, these institutional sources may in rare cases have adequate and very reliable data.

4. Industrial Censuses, Surveys and Public Sources

The existence in the last decade of UN advised industrial economic and commercial census efforts has created a large data source for agribusiness and rural enterprise analysis. In addition, there have been interim surveys set up in many countries under the auspices of the central census office to update the results of the censuses. The detail in these interim surveys is usually as good or better than the census efforts and the size of the surveys is such that they can be more easily accessed and utilized for A.I.D. project analysis purposes. In many cases, the coverage of these census efforts is such that they can provide data not just for sector profiles, but also of project identification, testing intervention hypotheses, and detailed description of the target group. The disadvantage of these census and interim survey data sources is that the quality of the interviewing and supervision may be very spotty, particularly in those countries where the 1970 census was the first industrial census effort. A second disadvantage is that in many cases small scale rural enterprises (under 5 workers) are excluded from the census efforts. Under the UN scheme, these small scale enterprises should be the subject of a separate questionnaire simplified in concept but administered in the same year as the general or large scale industrial census. In many countries, however, these small scale rural enterprise census efforts were not undertaken, or undertaken with such poor control that the results were either not processed or were processed but presented such inconsistencies that they were not released.

Chapter 13 contains a discussion of the use and problems related to census and interim survey data for project analysis.

C. Target Group Household Data

It is unfortunately true that most of the sources which may be relied upon for existing data for enterprise analysis fail to provide the necessary household information for A.I.D. project analysis. The focus of the Congressional Mandate for A.I.D. is on the household, its income, employment and other welfare dimensions. Agribusiness and rural enterprise projects may be important contributors to household welfare, but they are only a part of the system which impacts on households. Household members usually work in more than one employment type; farm employment and enterprise employment are important complements. To analyze enterprise employment in the absence of other household employment activities would be too partial for adequate project analysis.

Of the four mentioned possible data sources for enterprise level data, only two hold significant hope of providing the necessary household data for project analysis. These two are the A.I.D. initiated sample survey or the case study effort. Existing census, survey, institutional and secondary data sources are unlikely to contain the household welfare information which is required to link agribusiness and rural enterprise analysis with household benefit, and household resource allocation issues vital to A.I.D. project analysis.

Household data on health, nutrition, education, housing, sanitation and participation are most adequately elicited in the case study format where both the time and expertise on the part of the interviewer permit the necessary depth useful for these issues. Project analysis requires a connection between these welfare dimensions and enterprise data, and it is therefore unlikely that existing case studies of these non-economic indicators will suffice.

Sample surveys are at a significant disadvantage in these areas because of the lack of time for interviewing and lack of training on the part of the interviewer. The principal disadvantage is in the case of nutrition where nutrient intake, a common nutrition indicator, is simply beyond the reach of most survey efforts.

Employment data are among the most difficult to estimate with single surveys or single case studies. The seasonality and complexity of employment events makes it difficult to rely on annual or even monthly recall. If detailed employment data are desired, it is usually necessary to conduct case studies or sample surveys on a weekly basis during the complete year. General employment indicators may be gathered in case or sample surveys on an annual recall basis, but should only be used as comparative and not absolute indicators.

The same case study or sample survey effort which is designed to gather enterprise level data may be harnessed to provide the added household data for project analysis. It is therefore possible to mount a general household/enterprise data gathering effort without incurring the double administrative and cost burdens which would be implied by two separate efforts.

D. Data on Credit and Rural Financial Markets

1. Credit Supply and Demand

Credit supply data are easily obtained for that portion of agribusiness and rural enterprise credit which comes from established institutional sources. It is likely that the files and accounts of less than ten credit sources will cover more than 95% of all institutional credit to the sector. The more difficult credit supply to quantify is obviously the informal credit provided from a wide variety of rural lenders from the traditional "money lender" to

local input suppliers and product purchaser/marketers. The easiest viable way to gather credit supply information on these informal sources is to survey or case study the enterprises themselves.

Credit demand information may be obtained indirectly through credit institutions, but adequate treatment will only be possible when firm level demand estimates are possible, based on survey or case study data.

2. *Rural Savings*

Rural savings information may be obtained by gathering data from the rural institutions which mobilize that savings. Postal savings, cooperatives, and other rural savings institutions are possible candidates for useful data, but the savings potential of households held in cash or other investment forms will not be accounted for by obtaining data from institutions. Again the case study or survey alternative appears to be the best method.

E. Product Demand and Comparative Cost Data

1. Production Trend Data

The trend in output may be used to project demand in the absence of direct demand data. Production trend data are not likely to be available for the target group as a separate system, yet the general production trends captured in the sector-wide sources discussed at the beginning of this chapter should provide adequate data for this purpose. It is unlikely that the case study or survey alternatives would provide adequate data for this purpose; secondary and existing census sources are the only viable possibility.

2. *Consumer Demand Projections*

The principal data required for rational demand projections are based on household surveys, but not of the type which would be contemplated for project analysis. This is a good example of a type of data that would not be easily included in a multipurpose case study or sample survey of target households and enterprises. To elaborate demand estimates, price or income elasticities are needed. These coefficients originate normally in household consumption surveys, but as explained above it is not usually possible to include consumption data reliably in the type of sample survey efforts which would be fielded for a rural enterprise project analysis.

3. *Import and Export Data*

For projecting demand, it is usually very important to have adequate import and export data. The source of these data is almost always the public entity which controls international trade. Their annual publications usually suffice for the level of analysis required.

4. *Comparative Cost Data*

The costs of production in alternative areas or even alternative countries may be an important data type as described in Chapter 10. The sources for these data are almost always from existing case or micro studies. Some data can be obtained on comparative resource costs by accessing information on regional or international wage rates, but the richest data will likely come from scattered cost of production estimates for the products in question. The data sources for this type of information are very spotty and cost prohibits the project analyst from generating original data for this purpose.

F. Institutional and Infrastructure Data

1. *Institutional Data*

Institutional data on outreach capacity, financial and technical capability, and management potential must usually be gleaned directly from institutional accounts. For evaluation purposes, additional accounting procedures may be added to the existing data. The adequacy of these data is always a discomforting reality, yet the process of gathering such of it as exists is neither time consuming nor methodologically difficult.

2. *Infrastructure and Marketing Data*

The interface between infrastructure and marketing facilities and the project is a data area which presents few existing sources. Marketing margins may be gathered at substantial cost and seldom exist in any secondary form. If marketing is a central project thrust, both case studies and sample surveys of marketing enterprises will be justified and should provide the necessary information. If non-marketing enterprises are the major focus of the project, then a marketing/infrastructure portion to the questionnaires of the case study or sample surveys of target group enterprises can be included to provide these data.

There are a few isolated cases in which large and adequate marketing studies may already exist for the project analyst to draw upon.

G. Data Sources: Recall, Record Keeping, and Direct Observation

This last category is not really a data type nor a gathering method in the sense of a sample survey or a case study method. This section deals with the particular way in which the data are obtained at the household or enterprise level. These methods may be used regardless of the method used to sample or select the units to be interviewed or observed, and apply equally well in both case study and sample survey situations.

1. *Recall*

Recall is the method which depends on the memory of the respondent for the data. Recall data form the basis for most survey and case study methods. The use of recall as a data source has been the subject of much

discussion, but in the fields relevant to this manual there has been little research which would provide a concrete basis for judging particular situations and the advisability of using recall vs. one of the other methods. In general it is true that direct observation, where the field survey or case study personnel actually measure or observe themselves, produces superior quality data. Recall should only be used where the subject matter does not permit such direct observation or measurement, or where direct measurement would be too costly.

While there is no sophisticated body of evidence which could be used to govern the choice between these techniques, there are a few general rules which apply and which can be used to help in making the choice. There are certain types of data for which recall methods have proven unusually inadequate to obtain.

a. Number of Events Influences Recall Accuracy

It is obvious that the number of events one is asked to recall will have an effect on the accuracy of one's memory. Few would question that the small entrepreneur can recall with a high degree of accuracy the location of his business establishment, the type of product he produces, whether he operates in the summer or not. If, however, he is asked to identify the number of days the business operated last year, the recall may be questionable unless the number of periods it operated are few. It may be, for example, that it operated only in the summer, in which case he may simply be able to multiply the four summer months times 22 days to arrive at the figure. In this second case the number of events for recall purposes is only two, a beginning and ending time for the summer operation. The larger the number of events the entrepreneur is asked to recall, the less accurate the response.

Each time a data item is inserted in a questionnaire or in a case study format for response from recall, the study planner should identify the approximate number of items which will be required, or the level of detail he will have to recall. If the number is large the item should be carefully examined to see if direct measurement or record keeping could be used instead of recall.

b. Recency of the Events Recalled Influences Accuracy

The distance in time of the event to be recalled and the data of solicited recall will affect quality. If it is deemed necessary to have good estimates of what people do with their time, it is probably necessary to ask only about the last few days, if recall is the chosen method. To obtain an overview of time use over a one-year period, daily or weekly visits are probably necessary to obtain reasonable recall.

c. Importance of the Event in the Life of the Respondent Will Affect Recall

Different events enter memory with different force, and that force may be a function of many cultural and economic factors. Even though deaths in the family may violate the "recency" rule of recall, if the respondent is asked to recall the number occurring in the last ten years the importance of the event will probably overcome the tendency of time to erode memory.

d. Agribusiness and Rural Enterprise Data Types Inappropriate for Recall

It should be obvious that the timing of respondent contact with interviewers is a factor which can be adjusted to reduce both the number of events to be recalled and the recency of the events. While employment data, for example, is generally impossible to obtain on an annual recall basis, weekly or bi-weekly visits can reduce the recency and number of employment events to be recalled so that reasonable data can be obtained. These multiple visits are very costly, however, and given most A.I.D. project cycles it is virtually impossible to undertake such a multiple-visit observation. Therefore, while the comments which follow identify certain data types as appropriate for recall and others as inappropriate, it should be remembered that this discussion assumes that weekly revisits over a one-year period are not likely to be feasible. In certain cases such intensive interviewing may be possible, in which case these comments should be adjusted.

i. Employment Information on a Man Day Basis

Employment events are large in number even for a small firm if man days worked is the unit of denomination. Even if there are only two or three workers, the respondent may be attempting to remember many hundreds of events or days. Since man day figures are particularly useful in analysis, it is tempting to try to arrive at employment in man day terms, but it is unlikely that useful recall can be given even for the month preceding the interview. Without reducing the time lag of the estimates, that is, without decreasing the recency of the employment events to be recalled, the analyst can reduce the number of events to be recalled and obtain less detailed data for the same period. This may be accomplished by asking for employment in months or seasons for each employee. For example, the entrepreneur may be asked to recall the workers' names who worked during the last year in his enterprise. For each worker (if there are less than, say, five) he may be asked if this person worked more or less full time for how many months. This may reduce the number of events to a manageable level. Even so, the data would probably only be safe if used as a comparative, rather than absolute level of employment; that is if used only to make comparisons with other firms where the data had been gathered in the same fashion.

ii. Nutrient Intake Data

Agribusiness and rural enterprise projects often have improved nutrition as one of the central objectives. Nutrition may be measured either as improved diet, or improved health in the form of better physical growth or reduced illness. Improved food intake is very difficult to measure using recall, even for the week or day previous to the interview.

iii. Product Accounts

Costs of production for enterprises may be gathered if the scale of operation is small (i.e., few input purchase events) and if no attempt is made to obtain input use as opposed to input purchase events. It is also generally impossible to construct product-by-product costs of production for an enterprise based on recall. Total enterprise costs and output may be obtained with reasonable reliability if the number of sales and input purchase events is

small. If the number of sales events is very large, and the business is nonseasonal, sales estimates for the preceding week may be used and then expanded. The dangers of unrepresentative weeks in the observations will be reduced if the number of observations is large. Seasonality may be addressed by conducting repeated visits in the three or four principal seasons to obtain weekly recall data on sales events. The association of particular inputs with particular products is a data task of substantial proportions and is only appropriately addressed by multiple visit surveys or case studies.

e. Data Types Appropriate for Recall

Many of the types of data useful in project analysis can be adequately obtained based on entrepreneur recall. Among these items are input purchase events if the firms are small and the number of cash or in kind purchase events is small, credit information where the number of events is small and the importance factor is large, and equipment inventories and original costs. Replacement values may or may not be known, but if the respondent claims to know, the data are usually reasonable. Housing, sanitation, family education, and mortality information are reasonable to gather on a recall basis.

2. Record Keeping

A familiar method for obtaining data is to obtain it from records kept by the enterprise, household or other respondent. If records are normally kept this may facilitate the process, but it also brings problems of its own, especially in the case of agribusiness and rural enterprise projects. If income is to be estimated, it is important that all enterprises are subject to the same accounting conventions, similar depreciation methods, income definition, etc. It is unlikely that even if records are available that they will be similar enough in accounting style to be used for anything more than logs of purchase and sale events.

Where records are not kept, the survey process may introduce them for the purpose of gathering accurate data. The difficulties are many: illiteracy biases the types of entrepreneurs who may be able to use these systems; compliance between the interviewer visits is difficult to enforce. Where accounting data are concerned there are few situations in which record keeping as a method of obtaining enterprise data is of much help. There are limited situations in which it may be useful; for example, if the central problem is the recall of a series of events which are too numerous for annual memory to suffice, simple record keeping systems which overcome the literacy problem have been used. A small box may be placed by the interviewer in a prominent place in the enterprise to receive small sticks (also provided by the interviewer) each day that the owner works close to a full day in the shop. This type of method may also be extended to workers, and in fact to the recording of many types of data for which recall may be inaccurate due to the number of events to be remembered.

3. Direct Observation

Nutrition is a classic example of where direct observation is the only reliable method of obtaining accurate data. Height, weight and arm circumference measurements are common indicators of nutritional status in children. It is reasonably simple and inexpensive to obtain these data by having field survey personnel actually weigh and

measure the children in the sample households. The age of the child is the only recall data needed. Since measurement in children over six years of age is only sensitive to differences in annual ages, recall does not present a major problem. For children under five, however, monthly ages are necessary and there has been considerable evidence that recall at this level of detail is generally quite poor.

Direct observation or measurement of accounting data for enterprises is not usually practical because of the number of multiple visits which would be required to obtain the data. In the event that highly technical data on production rates, labor productivity on different machines, technological phenomenon are needed, direct measurement is likely to be the only acceptable data gathering method.

CHAPTER THIRTEEN: CASE STUDY, NON-SAMPLE METHODS, AND EXISTING ORIGINAL DATA

A Case Study Methods for Data: Agribusiness and Rural Enterprise Project Analysis

The types of data to be gathered in a case study or micro analysis are described twice elsewhere in this document, first in Chapters 6-11 and also in the evaluation Chapter 16. The purpose of this discussion is to focus on the data gathering method rather than on the content of the data gathered.

1. Selection of Cases

Two major compromises are involved in selecting the case study approach to generating enterprise and/or household data. The first is that the statistical reliability of the data is uncertain; the second is that with a limited number of cases, the richness of comparisons is very thin. Both of the weaknesses focus attention on the method by which cases are selected for inclusion in the study.

a. Selecting for Maximum Representation

If some survey or census information is available, it should be used to help select the cases to be studied. Even if the data available help only to clarify the geographical concentration of firms, the distribution of firms by scale and/or sector of activity, this information can increase substantially the chance that the cases will be drawn to represent at least major important classes of enterprises. The strongest case study design is one which subsamples a small number of cases from representative samples in order to provide data of increased depth and detail in conjunction with a larger sample survey effort.

By utilizing a census or survey to classify (or stratify) the enterprises into classes, the case study can draw one firm from each general type with some confidence that the resulting cases have some desired level of coverage of the sector or target group as a whole. With some overall data to use as a weighting scheme, the relative importance of the findings of different enterprise case studies can be roughly estimated. For example, if small baking enterprises represent only 4% of the target group, the case study on baking will be placed in its proper perspective. If the 4% position of baking is not known, the relative importance and weight which ought to be given to its case study will likewise not be known.

Selection for representation is therefore accomplished by stratifying the population into its major components based on the best global data available. If the cases must be drawn in a truly haphazard fashion, there is no way to know how to interpret the results. In saying that careful stratification will increase the representative nature of a series of case studies, it should be remembered that there is little basis for choosing the enterprise or household to be studied inside the stratum, and it is not likely that one single case could possibly be statistically representative

of the group as a whole. To achieve any stable kind of statistical reliability from case studies there would have to be at least 30 cases from each stratum, and by the definitions used in this manual the study would then be a "sample survey" and not a case study.

b. Selecting for "Comparisons"

A continuing emphasis in the data requirements of project analysis has been the need for "comparison" data of many types. Data with and without project interventions, data to compare before and after project interventions, and data to compare and look for differences which may give rise to possible project interventions with significant potential. The selection of cases will have a direct impact on the ability of the analyst to make these comparisons and should be kept in mind during the case identification process.

If the case study method is adopted, for example, in an evaluation context to provide data for estimating project impacts, then cases would need to be selected which matched participant cases with nonparticipants, or which treated "before" cases and "after" cases on the same enterprises or households. If the case study method is adopted to estimate project potential, selected cases would need to include enterprises with and without the proposed interventions.

The comparison use of case studies can contribute added detail for analysts and should be seriously considered whenever micro analysis is chosen.

2. Training

One of the principal advantages of the case method is that normally subject matter specialists are the ones who conduct the actual field work. This implies that there is no real training needed. The difficulty is not in training the case study personnel, but in selecting them. The general style of most case studies tends to be highly personal; that is, it tends to depend very much on the choice of interviewer. Two different interviewers may unfortunately come away from the same case with different viewpoints and different data. In case studies the role of interpretation and bias is much higher than in the case of sample surveys. Much of this bias, however, may be reduced by the use of comparably specific instruments as is discussed in the next subsection.

3. Instrument Design and Testing

The use of instruments is closely related to the degree of standardization imposed on a case study. Case studies vary greatly in the degree to which the interviewer is attempting to ask standard questions to complete a preset instrument format, or is making open-ended discussion and interviewing with the intent of reaching his own judgments.

There are many problems with standardization, but on balance the attempt should be made in case studies to force standardization as far as the professionals involved in the actual interviewing will permit. There is an obvious difficulty in making each situation fit into a standard format; each enterprise or household is a different experience and there is a strong tendency on the part of subject matter specialists to not want to be reduced to the role of simply filling out a preset questionnaire. If no reasonably consistent format is adopted, however, the potential

for personal bias, for seeing what the specialist wanted to see, is strong. Over and over, the results of case studies can be seen to correlate their conclusions with the field and even personality of the case study interviewer. If he is an industrial engineer, then the problems always turn out to be engineering problems. Problem identification for a marketing specialist usually turns out to focus on marketing problems, etc. To use so-called generalists (sociologists, economists) is not a satisfactory solution since one can identify the specific problem interest of even generalists and see that problem interest crop up in study conclusions.

Without a standard or nearly standard instrument, the case study approach blends almost indistinguishably into the field trip method for generating data where subject matter specialists travel to the field to observe and identify problems and solutions.

4. *Analysis and Interpretation*

For the case study this issue is again related to the degree to which an instrument was used. If no instrument is used it is likely that the field work is the analysis, or that all that is left is to write up the conclusions already arrived at in the field. In the event that there are instruments, and that those instruments contain the kind of firm level data and comparisons described in Chapters 5-10 and 15, the analysis phase should attempt to produce the analytical results described.

B. *Field Trips, Interviews with Officials and Other Informal Methods*

The central burden of A.I.D. project data gathering has always been, and continues to be borne by field trips and interviews with host country officials. While these methods are generally inadequate because of their inability to provide even token reliability and are subject to personal bias, there are situations in which they are the only acceptable mode of data gathering. The gradual focus of A.I.D.'s interest in household level impacts and in enterprise level interventions in which the poor participate in their own development has increased the difficulty of working with field trip and informal discussion as the basic vehicle of data and information gathering. Before passing to a discussion of the disadvantages of these methods, recognition should be made of the situations in which they are the best methods of gathering information.

1. *Advantages of Informal Methods*

Where the data to be gathered are about the commitment of an institution to a proposed project intervention, the best way to gather that information is by direct discussions with the institution concerned. There may be objective indications in the form of documentary commitments of funds or other indicators, yet direct discussion is probably the best method for ascertaining intent. Institutional capability may be assessed most adequately in these informal ways with experts whose long experience in similar situations qualifies them to draw capacity conclusions from the face-to-face interchanges. Outreach capacity is an exception to this general rule; statistical evidence of the historical outreach accomplished is superior to discussion as a source of data.

Informal methods have the advantage that they can fit almost any project development time frame, work with almost any problem, in any season, and require only limited administrative support. Their flexibility is at once their principal advantage and disadvantage.

2. *Disadvantages in Field Trips and Informal Methods*

a. *Personality and Professional Biases*

There is an old axiom which is held in many different forms in different A.I.D. missions, but means the same thing: you can almost predict the result of a consulting visit if you know the consultant well, know his field and his interests and opinions. This is an important disadvantage of the less structured methods of data gathering and project analysis, and field trips and host country discussions are the least structured of all. In these methods the biases of the analyst may surface virtually untrammeled by actual data. To be sure, if the analyst is a particularly unbiased person this may not be damaging, yet even professional training gives economists, engineers, extension specialists, agronomists and all other competent professionals a particular outlook or focus or approach to problems. It is not difficult to understand why the sociologist fails to identify the engineering obstacles as the central issues, or why the engineer does not usually identify the religious attitudes as binding.

b. *High Cost per Observation*

While informal methods may seem inexpensive because the total cost is a completely manageable figure, if the amount of data gathered per dollar is calculated the method turns out to be one of the most expensive ways to obtain information. To most practitioners the field trip would not be justified as a "data gathering" exercise; most field familiar professionals who think that field trips are very beneficial (the author included) would argue for them based on the "field sense" that is obtained by simply spending time probing haphazardly around. While it may be easy to argue for this, it is difficult to counter the overwhelming conclusion that few cases exist where minds were changed by a field visit.

C. *Existing Original Data Sources*

Without undertaking field work, a wide variety of data may be available in original form which can be used for agribusiness and rural enterprise analysis. These are most often in the census offices, in institutional files and records, or are the result of some earlier project evaluation or record-keeping system.

1. *Existing Industrial Census or Interim Survey Data*

As mentioned earlier, the 1970 decade of census efforts supported by UN personnel has left behind many usable data sets, some of which include small as well as large scale enterprises. In addition, the normal UN system encourages the census office to update the census results with annual or biannual sample surveys. In the event that these sources exist they can be subsamples in the case of a census, or used in their entirety if they are interim surveys. In contrast to population censuses, these industrial, commercial and service census questionnaires contain considerable accounting information which can be useful at all stages of project identification and design. The standard topics include:

1. Personnel, employment and wages.
2. Seasonal operation data.
3. Equipment inventory.
4. Primary material inputs.
5. Fuels, lubricants and energy consumed.
6. Other costs.
7. Output by product and other sources of income.

In all, more than 600 different data items may be reported on medium and large scale enterprises, and more than 200 on small scale enterprises.

2 *Institutional Files and Records*

Loan institutions often gather balance sheet information and in some cases more complete accounting information on their loan applicants. Cooperatives, industrial associations and others may likewise be examined to see if the answer to some project hypothesis or the clarification of some important project issue is already in their files.

Many A.I.D. projects from earlier years, or the projects of other international donors included data gathering components. Accessing these data sources is easier than host country institution files, and there is usually less concern with the confidentiality if the data were gathered with A.I.D. or other international donor funding. Because of the context of much of these data, it is particularly useful for testing impact hypotheses and for estimating project potential.

CHAPTER FOURTEEN: AGRIBUSINESS AND RURAL ENTERPRISE SAMPLE SURVEYS

The most comprehensive method for obtaining project analysis data which are representative of the target group population as a whole, and of its principal components, is a sample survey. By a sample survey, what is meant is a carefully selected subgroup of enterprises and/or households whose resemblance to the total population can be predicted with standard and well practiced statistical techniques. Information from the sample will represent at some measurable reliability the characteristics of the enterprises not surveyed.

There are many decisions to be made regarding a sample survey. This chapter is decision-oriented, with its objective being to provide the A.I.D. project team with the level of understanding necessary to write a scope of work for a survey, and then monitor the process. It is not possible to condense into a treatment of this size all of the necessary information to allow managers to become survey research statisticians, but it is possible to raise the level of awareness such that the A.I.D. project manager can interact with survey experts to make certain that he gets what he wants.

At each decision point in a survey project there are options. This chapter attempts to outline those options and without detailed description, suggest the pros and cons of the major alternatives. There are six principal areas of choice in a survey. They are:

1. A method for selecting the sample must be chosen.
2. The number of visits at each observation must be chosen (one visit, return each week, etc.).
3. If a control group is needed, how will it be selected?
4. The instrument must be chosen (Recall Questionnaire, Record Keeping, Direct Measurement).
5. The methods of selection, training and supervision of field workers must be chosen.
6. The approach to coding and data processing must be selected.

Each of these topics will be discussed in a separate section in this chapter.

A. Sample Selection

1. Definition of the Unit of Observation

The first step in sample selection is to define the unit of observation. This can be best done with concise English sentences describing who we want to respond and about what group of people or enterprises. It is important to be comprehensive in the definition so that there will be few exceptions to the definition. For example, an agribusiness and rural enterprise survey might have the following definition of the unit of observation:

The survey should include **households** outside urban areas (urban areas or their environs with more than 100,000 population in the last census) where any household member **owns** or **operates** a nonfarm **enterprise.** The respondent should be that member of the household most familiar with the management of the enterprise. The

target area includes provinces A, B and C. An enterprise for the purposes of the survey shall be any nonfarm business engaged in selling goods or services excepting services paid for by wages or salaries.

In the above definition the **enterprise owning or operating household** is the unit of observation. The respondent will be answering questions about the household and its enterprise(s). The definition should be such that in the field or in the design there is sufficient detail and clarity in the definition that one could easily tell whether or not a particular household qualifies as defined.

There is an issue missing from the above definition which deals with the size of the enterprise and/or the wealth of the household. Under the above definition even the wealthiest of rural households, perhaps owning a large sugar mill, would be included. A simple addition to the definition such as, "Households owning or operating enterprises which employ more than ten workers should be excluded," would solve that problem. It may be, however that such households, even though they are outside the target group on income grounds, should be left in the sample. First, they are likely to be relatively rare events and will not therefore consume a large proportion of the survey time; and secondly, if left in the sample, can also give some idea of the relative importance of different scales in the target area. The simple employment importance of these larger firms may be reason enough to include them.

2. *Determining a Sample Size*

Having defined the unit of observation (rural enterprise-owning household, for example), the next step is to determine the size of the sample; that is, the desired number of households which will be included in the survey. This step is one of the most technical in the whole survey process; what is said here is oversimplified and does not present the issue in exact statistical terms. Even though the choice of sample size may be technical, the basis on which it is decided is essentially nontechnical and must be determined by the project users of the survey and not the sample statistician. The basic choice relates to the level of detail desired in the final results.

The project analyst must decide how detailed his comparisons or measurements need to be; that is, how many subgroupings he will want to make of the surveyed enterprises or households. Will the analyst want to see provinces A, B, and C separately, or is it good enough to have them always together? Do large enterprises need to be separated from small ones, or will it be necessary to have three or four different scale groups? Will the analyst want to compare findings between different types of enterprises; if so, how many different types will be necessary? Will it be important to compare truly rural enterprises to those located in towns and villages; if so, will there need to be comparisons between small villages and large towns? These choices, which relate to the final use of the data, need to be answered in detail before the sample size can be determined.

The reason for this sequence in selecting a sample size grows out of a fundamental principle of statistical sampling which is important for the A.I.D. project analyst to understand. A quote from a standard text will set the stage for understanding this principle:

> "The greatest intellectual hurdle to the acceptance of sampling concerns the reliability of estimates. The potential user of survey research will often ask how one can possibly take a sample of 2,000 people in a country of over 200 million people and arrive at a reliable estimate of the number of multiple car families, potential voters who favor one or another candidate and so forth.
>
> Usually the most important factor in reducing the standard error is the **absolute size** of the sample. ... Newcomers to the field sometimes advance the common-sense hypothesis that sampling error depends primarily on the **proportion** of the sample to the total population. They might argue, for example, that a 5% sample

of a national census will be five times more reliable than a 1 percent sample, a 10% sample twice as reliable as a 5% sample and so on. While this argument may seem plausible it is erroneous."[14.1]

The size of the target group does not centrally influence how many enterprises or households need to be surveyed. The number surveyed depends on how detailed the subgroupings in the analysis will need to be, since each subgroup doubles the number which will need to be surveyed. For example, let us assume that the number needed to provide a reliable estimate is 30. If the analyst wishes to have results comparing the credit user enterprises with noncredit enterprises, he would need 30 for each of the two groups. If he wants further to compare these two groups for three subregions in the target area (each subregion separately), then he will need 30 for each of the two groups (credit and noncredit) in three subregions for a total of six subgroups with 30 in each of a total sample of 180 enterprises or households. If the type of enterprise is important and there are six types of enterprises, then the sample size would have to be 1080 (6 types X 3 regions X 2 credit groupings = 36 subgroupings X 30 needed per subgroup = 1080 total sampled enterprises).

If certain of these subgroupings can be made without having to at the same time maintain another subgrouping, the total number can be reduced. For example, if the analyst wished to make the geographic comparison, the enterprise type comparison, and the credit comparisons all at the same time, he would need the 1080 sample size. If, however, he could allow the comparisons to be made in separate tables, one at a time, he would only need 180 sampled enterprises. He could still compare enterprises by region, and then in another table compare them by type, and then by credit use, though some loss in statistical reliability results. What he could not do with the smaller sample size (180) would be to compare enterprise type and subregion. The difference in cost and time for a survey of 180 enterprises is substantially different from a survey of 1080 enterprises and the only difference is in the type of comparisons which the analyst must have to complete his adequate project design or evaluation. It is therefore worth considerable thought to determine the level of detail which is needed in the data to be obtained from the survey. This decision is not one which can be delegated to the sample designer; it is an issue for the user of the survey results. Once that has been decided, it is simply an arithmetic exercise to determine the total sample size. For rough estimation purposes, the A.I.D. manager may use the number 40 as the correct number of households or enterprises needed per subgrouping in order to give reasonable levels of reliability. The correct number of usable responses usually lies somewhere between 30-35 to give minimum acceptable reliability; the number 40 is used to allow for a margin of unusable responses in the sample. To get a general idea of sample size, the nonstatistician may first estimate the number of subgroupings he will need for analysis purposes and multiply that by 40.

3. Selecting a Method for Drawing Enterprises to Survey

There are two basic methods of sampling, using lists of enterprises or using maps. These two alternatives are usually called "list" or "area frame" methods. The best method is always the "list" method if it is possible and practical. Area frame methods are a compromise on statistical reliability, but have the significant advantage of being generally cheaper and faster in LDCs.

14.1/ Donald Warwick and Charles Lininger, *The Sample Survey; Theory and Practice* (McGraw-Hill Book Company, New York, 1975), pp. 82, 92.

a. List Basis for Selection of Sample

If the group to be studied consists of enterprises with loans from institution X, then the easiest and best method is a list frame sample. It is likely that all borrowers from institution X are contained on some existing list, or on records from which a list could be easily compiled. If the number to be sampled (determined by the process outlined above) is 200 of these borrowers, then the 4000 names of the borrowers on the list could be put in a hat and 200 of them drawn by a blindfolded official. This would be a statistically pure sample; it would be cheap and it would be rapid. This is known as a Simple Random Sample (SRS) and it is the ideal which all other sampling techniques strive to approximate. Where there is an existing complete list of all households or enterprises fitting the definition of the units we wish to study, the choice of sampling technique is simple—use that list and take a SRS from it. If you cannot draw from a hat, then number the names and draw numbers, or take every twentieth name (4000 total divided by 200 to be sampled = 20) from the list. All of these and many other randomizing techniques will work satisfactorily. If there is no existing list, then compile one; the only requirement is that the list be complete; that is, it should include all the enterprises or households which qualify under our definition of the group to be studied. If it is impossible or impractical to compile a complete list, then the very attractive statistical properties of an SRS must be foregone and the more complex techniques described under "area" frame must be used. In many cases it is possible to create a list by conducting a field census, but the costs of generating the list are even higher than using an area frame; list samples are usually not used because of the costs of generating a complete list.

b. Area Frame and Cluster Sampling Techniques

Where the population is not on any existing or easy to generate list, area frame samples are a viable alternative. While they compromise the statistical reliability of an SRS, they can yield acceptable confidence levels if properly administered. Suppose that the project analyst wishes to learn more about rural small scale enterprises in a target area. Using available maps the target area could be divided into three types of areas outside the major city. First might be towns, villages and rural groups of more than 10 houses. Second would be areas of farming and other disperse population. Third would be lakes, swamps and high mountains or virtually uninhabited areas. Expecting that enterprises would be rare events in area three, he might disregard this area from the sample completely. By looking at his list of subgroupings desired (compiled to estimate sample size), he finds that he wants to compare town and village enterprises with farm-based or truly rural ones. The town and village areas which constitute area one on his maps could be an essentially separate sample from area two, farming areas. Reviewing the list of subgroupings may suggest other subdivisions in the map which will dictate how the areas are to be structured.

The next step is to divide each of the villages into equal sized segments on a map in such a way that the dividing lines between segments can be identified in the field as well as on the map. This means following streets, fences, rivers or other natural and observable boundaries. Let us suppose that there are 546 of the villages and that there are 1352 equal sized segments in all of the villages, some villages having as many as 14 of these segments and many villages comprising only 1 segment. By visiting a haphazard group of just 10 of these segments, we find that there are about (very rough estimate) 3-5 nonfarm enterprise-owning households in each segment. From the list of subgroupings it can be seen that for the village enterprises we need a large enough sample to divide them into 10 subgroups (five enterprise types and two scales or sizes of enterprise). This means that approximately 400 enter-

prises will need to be drawn from the village areas (10 subgroups X 40 per subgroup). If we are right that there are 3-5 enterprises in each village segment, then about 100 segments would yield the necessary 400 sampled enterprises. If our estimate of 3-5/segment is too high, we may have less than 400 and be able to have less detail (for example, perhaps only 4 enterprise types) in the results.

Knowing that we wish to sample about 100 village segments, we can now simply number all of the segments from 1 to 1352, then put these numbers in a hat and draw 100 of them. These 100 selected segments could be found on the map by the field survey personnel and the interviews conducted. To illustrate the mapping materials used for such a survey, Figure 14-1 has been included. This figure shows an actual section of a survey area frame selection map for a heavily populated section of rural El Salvador. The heavy black lines mark the limits of the village areas. The lines inside these village areas divide the villages into segments. The heavily shaded segments inside the villages are those segments selected at random to be included in the survey.

The same procedure could be followed for the nonvillage farming areas. In Figure 14-1 the lighter shaded rural areas are those segments which were randomly selected for inclusion in the rural portion of the survey.

There are many variations which can be made to the general idea presented as the model for the area frame sample method. If the survey wishes to find a certain type of enterprise, fruit and vegetable processing and packing, for example, it may be necessary to first enumerate all enterprises in a larger number or larger sized set of village segments with a questionnaire which is very short, asking each household only if they own or operate an enterprise and if it is a fruit and vegetable one. Then a random sample could be drawn from the list of fruit and vegetable enterprises for final detailed interviews. This design would then be a combination of list and area frame methods.

Without undue delay it is possible in most agribusiness and rural enterprise situations to design a sampling method which will yield acceptable results, once the definition of the target group and the level of detail desired in the analysis have been accomplished.

B. Determining the Method and Frequency of Field Observations

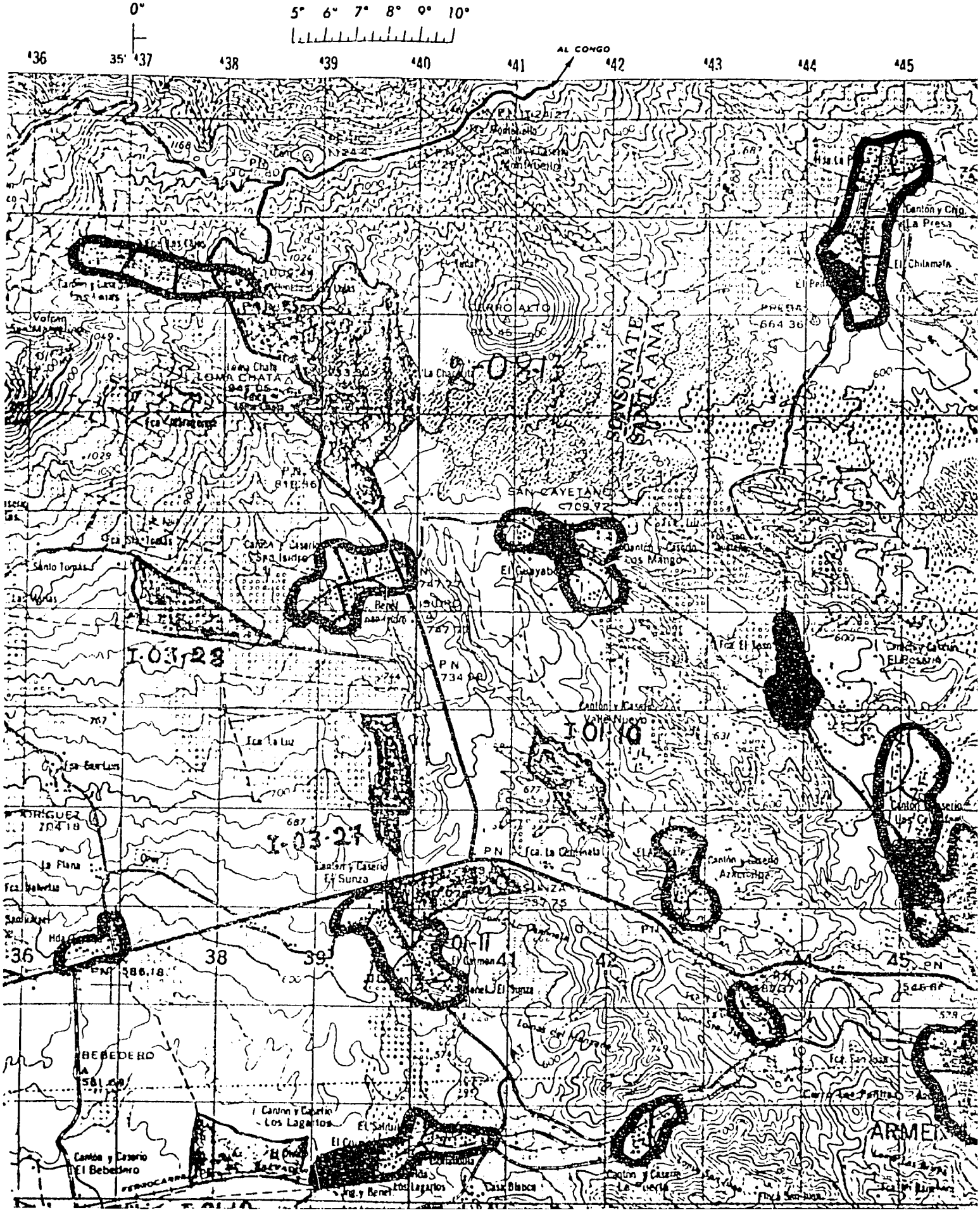
The three basic methods of observation are recall, record keeping, and direct measurement. All three of these may be used in the same survey or they may be used separately to constitute the sole observation technique. A discussion of the situations in which each is most appropriate is contained at the end of Chapter 11.

Interacting with the methods of observations is the frequency of visit. For some types of data an annual single visit survey will suffice; for other types of data, daily visits over a month period or weekly visits over a year's period will be required. The number of visits will probably depend not only on the type of data but also on the methods of observation selected. If recall is the method, then the number of visits will be used to adjust the recall period and the number of events to be recalled.

C. Control Group Comparisons

If comparisons are structured in the analysis between two well defined groups, then the structure of the sample and the number of visits will be affected. For example, if it is decided that to estimate the potential of a technical assistance proposed intervention, it would be useful to estimate the income of enterprises with and without

Figure 14-1. El Salvador: Area Frame Map.



technical assistance which already exists in the target area. The structure of the sample would obviously have to adjust to this design.

Longitudinal comparisons (before and after) are common in evaluation designs, and it is obvious that multiple visits (at least one before and one after) are required by such a design.

D. Instrument Design and Testing

The design and testing of the instrument (questionnaire, record-keeping formats, or forms for direct measurement) is an important part of the survey process. This is perhaps the stage at which the fullest experience on the part of the design personnel is required. Familiarity with the alternative types of questions which might be used to elicit usable and obtainable data is one critical element. Secondly, linguistic familiarity with the terms used in the area to be surveyed for the many items which are to be gathered is necessary. Host country personnel with intimate field acquaintance with both the people and the language in which the survey will be administered must be involved in this process.

Once the questions have been selected and the general structure of the instrument is known, professional help in designing the questionnaire so that it will be easy to administer, code and process is an investment well worth the cost.

With a draft questionnaire it is important to administer a field test to see if the structure of the design will function in the field. This test should be coordinated such that it can be undertaken by the supervisors and interviewers who will actually take it to the field for the final survey. The field test serves as a method of training for the field personnel.

E. Supervision and Training

Field supervision is perhaps the second most important element in conducting an acceptable survey after randomizing the sample selection. Many surveys attempt to correct in the office, after the field work is done, many errors and inconsistencies which appear in the data. This is, unfortunately, too late for such corrections. Once the data have left the field, there is little chance that useful corrections can be made. The time to make these corrections is while the team is still in the field; in fact, while the team is still in the area where a re-interview is possible. To catch these kinds of errors, there must be a field supervisor with the time to review all of the instruments within a day after they are administered to find errors so that the household or enterprise can be revisited. This generally means that there must be one supervisor for every three, or maximum four, interviewers.

The training of both interviewers and supervisors should be conducted coincident with the field testing of the survey instrument; each supervisor and interviewer should have completed at least three actual interviews with time in a classroom setting to discuss his problems with a course director, before actually beginning the survey.

CHAPTER FIFTEEN: IMPLEMENTATION AND MONITORING

A. Definitions

Implementation is here defined as the period of a project's life after design is completed when planned activities are carried out in the field. It is the direct action phase.[15.1] While volumes have been written on methods for project design and evaluation, comparatively little has been written on the methods for improving implementation. Allison has referred to the analysis of implementation as the "Missing Chapter in Conventional Analysis"[15.2] and though a careful recent review of the implementation literature by Ingle[15.3] identified copious documentation on the subject, yet implementation remains the project stage which has been most ignored by analysts.

This chapter distinguishes between two types of activities which take place during the implementation phase of a project. The first of these is termed "implementation," the second, "monitoring." Implementation is taken to be the project activity itself, undertaking project tasks; while monitoring is defined to be the information gathering and reporting which provide project monitors and managers with the necessary knowledge of project progress to make improved implementation decisions.

Most A.I.D. agribusiness or rural enterprise projects involve the provision of some financial, technical, or physical input to participant agribusinesses or rural enterprises. At the end of the process is an entrepreneur taking business risks, integrating the project input into his business and seeking for increased income and welfare as a result. Even research and infrastructure projects fit this pattern, though in a less direct way than a credit or technical assistance project does. Viewed in the most common A.I.D. project case, implementation might be more precisely defined as: **The process of getting project resources (advice, money, goods) to the risk-taking entrepreneurs.**

Since risk-taking entrepreneurs are the heart of most agribusiness and rural enterprise projects, it may be fairly said that most of these projects involve a "private sector approach." This is not to suggest that public entities are not central to the projects. Public development banks, research and technical assistance agencies may play a vital role in these projects, but the most important implementation link is to the private entrepreneur. The private sector represented by private businesses of many different scales is the final implementation system in most of these

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15.1/ Williams defines implementation as the "stage between a decision and operation." It begins with "the development of program guidelines or design specification; moves to ... lengthy stage of trying to work through a myriad of technological, administrative, staff and institutional problems that confront a new activity ... [and] ends when the experiment is deemed ready to test or when the nonexperimental activity is judged fully operational." See Walter Williams, "Implementation Analysis and Assessment," *Policy Analysis* (Summer, 1975), pp. 531-566.

15.2/ Allison's discussion favors increased analysis and emphasis on methods for implementation and argues that current policy analysis, both formal and informal, pays little attention to implementation problems. Further, while the tools currently available for implementation analysis are rather rudimentary, there do exist guidelines which offer reasonable prospects for making substantial improvement in implementation processes. Allison concludes that research aimed at developing methods for implementation analysis with a focus on identifying obstacles to and opportunities for implementation is more than overdue. See Graham T. Allison, "Implementation Analysis: 'The Missing Chapter,'" *Benefit Cost and Policy Analysis*, 1974, R. E. Zeckhauser et al., eds. (Chicago: Aldine, 1975). In this same vein see Erwin C. Hargrove, *The Missing Link: The Study of the Implementation of Social Policy* (Washington, D.C.: The Urban Institute, July, 1975).

15.3/ Ingle conducted a review of the implementation literature for A.I.D. His work is the first such comprehensive review of the topic and is drawn on with permission for many of the sources and ideas of this chapter. See Marcus Ingle, "Program Implementation in Developing Countries," *A Review of the Scholarly and Academic Literature* (Development Support Bureau, Office of Development Administration, Agency for International Development, 1978).

projects and it is important to approach implementation with a view to making certain that it complements rather than undermines existing financial structures and private sector resource distribution systems.

This chapter outlines some of the principal topics related to the process and method of implementation as they specifically apply to agribusiness and rural enterprise projects. The treatment given the subject here will of necessity be less complete than would be possible in a manual dealing only with implementation. For more extensive treatments interested readers are referred to the noted articles and studies on the subject.[15.4]

In addition to the authors listed on the cover, this chapter benefits from ideas and written materials from George Metcalfe of Technoserve and Marcus Ingle of Practical Concepts, Incorporated.[15.5]

B. Project Design Choices Which Affect Implementation

Implementation problems can be anticipated in adequate project design. Various project design choices will have fundamental impacts on the nature of the implementation process. This section examines design alternatives and issues with critical implications for implementation.

1. Project Implementation Problems: Prevention vs. Cure

If the analysis process outlined in Chapter Ten (Examining Project Feasibility) is followed before projects are approved, many of the problems which later surface during implementation will be prevented. Institutional feasibility analysis conducted during the project design phase should suggest areas where implementation bottlenecks are likely to arise and where increased staff, staff training or added resources and assistance will be required to prevent implementation crises.[15.6] There is great benefit in early identification of problems; in many cases the sheer momentum of a large project in motion prevents the solving of problems which were not identified early

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15.4/ The following three articles and four manuals will provide the interested reader with a wider range of discussion than that found in this chapter: Gabriel U. Iglesias, *Implementation: The Problem of Achieving Results* (Manila: Eastern Regional Organization of Public Administration, 1976); Arturo Israel, "Toward Better Project Implementation," *Finance and Development* (March, 1978), pp. 27-30; Philip C. Packard, "Implementation of Agricultural Projects," *Bulletin of Rural Economics and Sociology*, 5 (1970), pp. 171-199; Jeffrey L. Pressman and Aaron B. Wildavsky, *Implementation* (Berkeley: University of California Press, 1973); Dennis Rondinelli and Aspy Palia, *Project Planning and Implementation in Developing Countries* (Honolulu, Hawaii: East-West Center, 1976); United Nations, Industrial Development Organization, *The Initiation and Implementation of Industrial Projects in Developing Countries: A Systematic Approach* (New York: United Nations, 1975); World Bank, *Central Projects Memorandum N.1.2. Project Implementation and Supervision* (Washington, D.C.: IBRD, June 30, 1975).

15.5/ George Metcalfe, Ph D, is Senior Vice President of Technoserve, Norwalk, Connecticut, a private voluntary organization with substantial experience in agribusiness and rural enterprise development. Dr. Metcalfe reviewed the drafts of this chapter and has provided useful ideas and reactions, many of which are included as footnotes to this chapter. Marcus Ingle, Ph.D., has written a number of important papers on implementation and has been involved in developing an Implementation Model for Practical Concepts, Incorporated. Dr. Ingle has provided both ideas and written notes from his studies which have been incorporated as footnotes in this chapter. Susan Goldmark of Technoserve assisted with review and useful comments on the draft.

15.6/ Methods for institutional feasibility and organizational viability analysis are outlined in the following documents: George H. Honadle, "Anticipating Roadblocks in Organizational Terrain: How Development Project Organization Design Makes a Difference," Washington, D.C.: Development Alternatives, Inc, 1977 (mimeographed); Saul M. Katz, "A Methodological Note on Appraising Administrative Capability for Development," in *Appraising Administrative Capability for Development* (New York: United Nations, 1969); Practical Concepts, Incorporated, "The P/C/I Model: Some Practical Concepts for Assessing Organizational Viability, Volumes I, II and III," Report submitted to the U.S. Agency for International Development, Contract No. AID/CM-otr-C-73-200 WO#2; E. Rizzo and J. Koteen, "Guidelines for Appraisal of Recipient's Project Management Capacity," Prepared for the Office of Development Administration, Agency for International Development, September 27, 1976 (mimeographed).

enough.[15.7] Changes made in the project design phase are relatively painless, while modifications made later are costly, and in many cases impossible to make. One way to get a project design which is implementable is to include the people who will have to implement the project in the team elaborating the project design. Those who are faced with the responsibility of actually undertaking project activities are often more serious about making certain that the design is institutionally feasible.

Institutional feasibility involves not only the entities involved in providing resources or technical assistance to the enterprises, but the institutional and organizational feasibility of project activities inside the enterprises themselves. Enterprises vary widely in the stage of their development and management ability to absorb project interventions and care must be taken to assure that proposed project activities fit the development stage of the enterprises to be assisted.[15.8]

In addition to institutional feasibility and its implications for project implementation, there is the important issue of the demand for project services or resources. If there is no viable market for the output of the enterprises, there are likely to be major implementation problems. If there is no evidence that agribusinesses and rural enterprises in sufficient numbers and target group impact qualifications desire project services or resources, there are likely to be implementation problems.

A few extra weeks of careful analysis of institutional feasibility, and of the demand for project services/resources, can prevent months of struggle with implementation bottlenecks.

2. *Experimental Approach to Implementation*

Three decades of development assistance projects without adequate evaluation have left a legacy of uncertainty about which technical assistance and direct investment approaches work. In this environment it is not easy to design projects around tested principles, yet the project review process demands a decisive and definite tone in project proposal documents. Project designers feel compelled to claim to know the right way even if they are uncertain.[15.9] While there is in reality much that is experimental in almost all agribusiness and rural enterprise

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15.7/ The importance of decisions taken early and their effect on implementation is emphasized by Metcalfe: "Implementation is one of a series of integrated action steps in the enterprise development process. Each activity in the chain requires explicit decisions by [entrepreneurs] and [the] assistance agency to continue, modify, or stop the process. The most important decisions/actions are those that precede implementation, i.e., *before* people and material resources are brought together and committed to the productive activity planned." See George Metcalfe, *Recommendations on Enterprise Development*, Technoserve Memorandum, Norwalk, Connecticut, 1979.

15.8/ A useful way of looking at the stages of growth of assisted enterprises is outlined in Technoserve's "Lessons Learned" document: "It is Technoserve's experience that enterprises generally pass through five 'stages of growth' on their way to maturity. These five stages may be briefly characterized as follows:

- —Preformalization - initial enterprise concept is developed
- —Formalization - initial planning and capitalization takes place
- —Start-up - enterprise becomes operational at a low level and needs arise
- —Consolidation - enterprise is reorganized, problems resolved
- —Expansion - profitable operation and maturity in management leads to expansion

It must be recognized here that the usefulness of these concepts is extremely limited except as a general means of breaking down the enterprise development process for analytical purposes. Most of the enterprises Technoserve assisted in its early years were in the pre-formalization or formalization stages and required Technoserve's assistance until they were well into the expansion stage. Assisting enterprises at this stage in a highly specific and timely manner can be very cost-effective as a means for generating substantial positive impact on the target population in a relatively brief period." See Technoserve, *Lessons Learned*, Norwalk, Connecticut, 1978, pp. 51-52.

15.9/ Project designs often read as if the sheer force of will on the part of A.I.D. and the local institution will cause the project to produce its desired results. A much more pragmatic, "experimental" approach to finding out what works may be needed as illustrated by the following Technoserve notes on lessons learned. *"Grand Solutions:* Technoserve's experience confirms that 'grand solutions' and 'great leaps forward' are not pragmatically possible. Efforts to mandate great leaps forward not only fail, but may also be detrimental to the common good and debilitate the development process." *Ibid.*

projects, project design teams rarely express the experimental nature of proposed activities, and more importantly, almost never design the implementation process as an experiment.

At a variety of decision points in the design process, analysts face two or three alternatives in the project design, none of which are clearly superior. Instead of establishing the project as a format for finding out which of the design alternatives work best, most design teams select one with very little reason. Implementation experiments need not be elaborate scientific structures,[15.10] they can be as simple as trying one vehicle per rural loan officer in one area and three officers per vehicle in another to see if the added investment really results in sufficient added lending activity to justify it. Experiments are not without their problems; project design and budget would need to be flexible to adjust to the results of the simple implementation experiments But even with the added difficulties which may be associated with experimental approaches, they have significant potential for learning from implementation experience.

Small scale enterprises exist in a high risk environment, and risk defines many of the rules by which small scale entrepreneurs function. Agribusiness and rural enterprise projects enter this private sector world and must somehow build adjustment mechanisms to accommodate to the realities of the private sector environment. Risk is an explicit part of private sector lending, and allowance for risk is an integral part of every private sector financial and business institution and organization Public sector programs, and very often A.I.D. programs, are unable to deal with risk in a flexible and agile fashion. Business risk makes every small scale enterprise investment or technical intervention an experiment, and explicit provisions should be made for implementation mechanisms which deal with business failure without casting a cloud over the project. Being able to cut losses and redirect investments easily is a central part of the implementation flexibility inherent in private sector activities and which A.I.D. projects in this field would do well to imitate.[15.11]

3. *Flexibility in Project Design*

An important design choice which will affect the implementation process is the choice of level of detail in the design. A very detailed design leaves little flexibility to make mid-course adjustments based on changed circumstances and mistaken perceptions on the part of project designers. An overly flexible design leaves too much to be decided during implementation and may be the same as issuing a blank check to the intermediate implementing entity or final recipient of the project's resources. It is important that the middle ground be found which leaves the necessary flexibility in the hands of the implementing entities yet assures the funding entity that the project will not lose its moorings to the initial intent.

15.10/ An example of an implementation experiment using a development project may be seen in S. Espinasse, "Planning and Implementation of a Development Project: Lesson from an Experiment: Befandriana-Mandritsara (Madagascar)," *Developpement et Civilisations*, 52/53 (1973), pp. 65-79 (in French).

15.11/ "Enterprise Failure: Technoserve has learned that the development of enterprises in developing countries is a high risk activity. Even enterprises which appear to have a high probability of achieving economic and social viability sometimes fail. Some failures are to be expected as a normal state of affairs. Technoserve and its partners/donors must be able to absorb these setbacks without threatening the overall credibility of the program effort." See Technoserve, *Lessons Learned*, Norwalk, Connecticut, 1977, p. 49. "Business failures should not be synonomous with the failure of technical assistance. Cutting losses is essential, especially if the cutting occurs early on in the enterprise development chain from the viewpoint of the technical assistance agency." See Metcalfe, *Recommendations*.

A useful mechanism for finding the appropriate middle ground is to be clear about the objectives of the project and the principal means which are to be used to achieve these objectives. Beyond that section which would not be amendable or subject to review there could be specific mechanisms for review and revision built into the design which would allow all parties to participate in the mid-course adjustment of important elements of the project. All those other areas of decision in the project which can be legitimately left to the unilateral decision of the implementing agency without affecting the intent or principal means of the project should be unburdened by necessity for complicated approvals.

4. The Project Implementation Calendar

Project design involves the establishment of a chronology of project activities and an estimate of project completion targets. These targets often impose a structure for implementation which is unrealistic. In a review of nineteen A.I.D. projects, Wynia found they all had project implementation delays.[15.12]

Setting an ambitious calendar for project achievements may be used as an explicit mechanism to encourage hard work and to place a certain amount of productive pressure on project implementation personnel. The problem with this approach is that it has the potential for having just the opposite effect—if project fund disbursements, project reviews and documentation are keyed to the same calendar, considerable implementation difficulty may be caused by unrealistic targets. Time pressure may be useful, but it can also cause inefficient allocation of resources; i.e., time and money unwisely spent to meet artificial deadlines. A reasonable solution is to set targets but at the same time set up a mechanism for revising the calendar. This will allow the project monitors to "manage" the time pressure factor and prevent it from becoming counterproductive. It is important that disbursement rate concerns based in Washington not dominate the design and implementation process. Multi-year funding can be a useful mechanism for depressurizing the implementation calendar and allowing for adequate staging and flexibility for managing the implementation process.

5. Disbursement Planning

In agribusiness and rural enterprise projects, design choices about the procedures required for the release of funds and project resources can have a significant impact on implementation. As in the areas already discussed, there is a tension between emphasizing flexibility and insuring that project objectives for financial participation of host country and enterprise owners are met. Elaborate counterpart fund disbursement arrangements with local entities or enterprise owners may insure participation and fund commitment on the part of the local entities, but also place important burdens on the implementation process. A balance must be arrived at which includes enough financial complexity to distribute risk, assure participation and commitment, and protect the integrity of project funds. At the same time, however, it must allow sufficient speed in operation so that funds are available when badly needed. Project designers should always ask themselves how long it will take to process the counterpart and disbursement arrangements required. If the time period is unreasonable, ways must be found for simplifying the procedures.

15.12/ The Wynia study involved 19 projects in Central America and demonstrated that the time delay was similar irrespective of the varying conditions under which they were initiated and carried out. Delays in project implementation seemed to be influenced by the processes of policy formulation regarding the project. While the Wynia study did not directly address the assertion, it is probable that project designers could have anticipated some of this delay. See Gary W. Wynia, *Politics and Planners: Economic Development Policy in Central America* (Madison: University of Wisconsin Press, 1972).

C. *Institutional Mechanisms*

1. *Delivery Channels for Access of Agribusinesses and Small Scale Rural Enterprises*

Most of the work of implementation may be divided between "accessing" the enterprises and "intervening" in the enterprise. If the number of enterprises is small there will be relatively less implementation work in building and refining access channels. If the project involves large numbers of small scale rural enterprises, service and resource delivery systems will be a large concern of the implementation process. In most cases there are private and public alternative channels for the delivery of project services and resources. For example, in the case of enterprise credit there are public development banks, and in the private sector there are private banks, moneylenders, product purchasers, etc. Care should be taken to explore both of these alternatives. Where viable private channels are available, there are significant implementation advantages in utilizing and improving them. In many cases, however, public channels are the only viable alternatives.

Examples of the two contrasting methods are the A.I.D. agribusiness and rural enterprise projects in Guatemala and Paraguay.[15.13] In the case of Paraguay, the intended final beneficiaries are small farms. Private sector channels in the form of agribusinesses which purchase farm produce or sell farm inputs are funded directly by the project. The extension of the service, credit, or input to the final beneficiary is through a private sector mechanism, the privately owned agribusiness. In the case of Guatemala, the final beneficiaries are the owners and operators of a large number of small scale rural enterprises. Public sector financial channels and technical assistance entities are intermediaries for provision of the final services and resources, though private sector cooperatives are also utilized. In Peru, the A.I.D. Agribusiness Project[15.14] combines many of the elements of both approaches.

Each case is individual and the channels for outreach to the final businesses and enterprises must be determined on a case-by-case basis. It is important that the channels be well outlined and if possible show evidence of capacity for the type of outreach implied by the project's objectives.

2. *Private and Public Intermediaries*

For agricultural and rural development to proceed, more innovative ways for private sector participation must be found.

A variety of systems and mechanisms exist. It is up to each project manager together with the host government to decide which mechanisms, or combinations thereof, would be most appropriate. This will largely depend on the sophistication of the infrastructural system within the specific country and capacity of the existing private and public sector. Before the private sector mechanism can function normally to the greater benefit of the majority, the government must take certain steps to insure that the implementation process can proceed. This is done, as noted in the preceding chapters, by having government policies give priority to reorienting and synchronizing private and public activities in support of agricultural and small scale enterprise development.

15.13/ USAID Paraguay Rural Enterprises AID-DLC/P-2180, Project Paper Asuncion, 1976, and USAID Guatemala Rural Enterprises Development AID/BAS-020, Guatemala, 1978.

15.14/ USAID Peru, Rural Development Agribusiness Fund, AID-DLC/P-2243, Lima, 1977.

Where private or public programs exist, advantage should be taken of them. Such programs as those conducted by the University of the Philippines Institute of Small Scale Industries, which assists entrepreneurs in preparing, formulating and analyzing the feasibility of proposals, presenting them to government and commercial lending representatives have led to the funding of a significant number of projects. Government subsidy or incentive programs might encourage agribusiness/urban enterprises to consider rural villages and market towns as alternative locations to larger cities.[15.15]

Improvements in project design, planning of production and marketing aspects for entrepreneurs and owners of agribusiness/rural enterprises can be made through government training and extension assistance. In most LDCs, agribusiness firms tend to have a centralized management structure, and thus there is a scarcity of trained management personnel. Implementation procedures should assure that a move away from centralization to the rural areas must be accompanied by management training programs. For example, industrial extension services in India, Japan and Korea provide prospective entrepreneurs and owners of small rural enterprises with advice on production alternatives, plant layout and machinery installation and operation. Demonstration of efficient technical processes are conducted by extension service centers in India, reaching rural areas with small mobile workshops mounted on trucks.[15.16]

Poor credit ratings of small scale agribusiness/rural enterprises are often compounded by their lack of knowledge of accounting and financial analysis skills, their limited knowledge of banking and credit procedures, and the complexity of requirements imposed by lending institutions. New means and mechanisms must be found to counteract this, if implementation, by bringing more enterprises on stream, is to proceed. Entrepreneurs and credit personnel in charge of implementing loans must be trained in accounting, financial analysis, borrowing procedures and loan negotiation.[15.17] These mechanisms must be decentralized in order that the institutions and personnel are located in the same rural areas as the enterprises themselves. Basic to any serious rural development effort is a program for mobilizing savings in rural areas and market towns and cities.[15.18]

It is not enough to assume that the proper mechanisms will naturally fall into place. The Mission should attempt to see to it that "integrated lending packages" are created by government agencies and commercial lenders for agribusiness/rural enterprises to combine credit, technical assistance, design and marketing advice and managerial training. Appraisal and lending procedures must be liberalized and should be based on the proposal's merit rather than the credit rating of the borrower.[15.19]

Active cooperation between large and small enterprises is another method of linking agribusinesses, agro-industries and agroservices in the process of expanding participation in agricultural and rural development. Providing technical assistance in organizing and supervising production processes, controlling the quality of products and providing managerial training to satellite industries is a means whereby larger firms, be they U.S. or indigenous, can provide useful inputs and assistance to small scale rural enterprises.

15.15/ D. A. Rondinelli, "Small Industries in Rural Development: Assessment and Perspective - Productivity, *National Productivity Council Journal*, India, 1978.

15.16/ *Ibid.*

15.17/ *Ibid.*

15.18/ *Ibid.*

15.19/ *Ibid.*

Expansion of export potential for agribusiness/rural enterprise products is important in specific LDCs and would alleviate situations related to low domestic demand and small volume of production. One mechanism to bring the necessary expertise and training that is needed in most LDCs is organizations that specialize in this area. One such is the World Trade Institute (AID/WTI Project) which promotes export expansion in LDCs through training, workshops, market studies, design of production processes, and identification of export opportunities. Another is the UNCTAD/Gatt International Trade Center (ITC) which essentially performs the same service.

Another implementation method is the linking of private U.S. intermediary mechanisms to LDC food and fiber delivery systems. Examples include both nonprofit and profit organizations, multinationals and medium size firms. In various ways these institutions link government, rural, and agricultural development goals with corporate profitability and operational abilities.

In certain specific cases, Missions and host countries should examine the feasibility of utilizing these mechanisms to implement the project in regard to training, technology transfer, generate employment, increase agricultural production by small farmers, establish viable small business and satellite industries and promote cooperatives and associations.

A number of intermediate organizations have created some promising new initiatives to utilize the skills and resources of large corporations in food system and rural development. In essence these organizations serve to link corporations to the local political and social environment and to the needs and aspirations of the host country in which they operate.

The new processes they have developed use local labor, capital and natural resources, plus modest outside capital, to create viable enterprises which would not otherwise come about. Their projects all emphasize the transfer of technological and management skills to host country nationals. Most, though not all, manage to operate on relatively modest budgets.[15.20]

15.20/ Following are some examples of institutions illustrating alternative modes of private sector involvement.

Technoserve Inc.: Provides fully integrated services to a number of LDC agribusiness/rural enterprises which can be considered under four functional categories: catalytic, management assistance and training, technical assistance in the location, development and selection of labor-intensive technologies suitable to the scale and capital available to a given project, and fourth, capital funding assistance.

Industry Council for Development (IDC): A nonprofit organization with an international board of directors and membership made up of agribusiness firms. With a grant from AID, IDC will implement a commercial seeds industry promotion project, designed to provide practical assistance to LDC commercial seed enterprises to help improve their effectiveness, with particular emphasis on involvement of private sector indigenous resources. This is an example of an international organization acting as an intermediary mechanism between the LDCs and the private seed companies.

Partnership for Productivity (PfP): A nonprofit organization involved in management skills training in Africa. It is helping LAMCO Mining Corporation develop a community that will prosper after the iron ore body in Yekepa, Liberia, is exhausted. PfP, through modest investment services and training, has catalyzed an integrated program of small business and rural development in Yekepa and surrounding areas. It has also served as a bridge between the corporation and the government, bringing together their combined resources in a collaborative development effort that has built mutual confidence and released the creative energies of both sectors.

Coordination Rural, A.C. (CRAC): Another intermediate organization, it is a nonprofit subsidiary of the Mexican corporation Ingenieros Civiles Associadoes, S.A., and has specialized over the past decade in creating profitable, economically self-sustaining development enterprises in rural Mexico. It helps establish local farmer organizations, draws private investment into new locally-owned businesses, and stimulates local participation in social developments to improve the quality of life.

Fundación Chile: A nonprofit institution supported equally by the American multinational corporation, ITT, and the Chilean government, provides technical assistance to private industry and government agencies in developing Chile's industry and rural capabilities. Organized like an operating business venture and drawing heavily on ITT expertise, the Fundacion is creating in Chile the ability to identify and develop market opportunities through the application of appropriate technological and managerial skills.

Latin American Agribusiness Development Corporation (LAAD): A private for profit company specializing in financing and developing agribusiness projects in Latin America and the Caribbean. Its shareholders include fourteen leading American agribusiness companies and some banks. It supports high impact projects that will accelerate the economic development of the host country. The 110 projects it has financed in 12 countries since 1970 have created thousands of new rural jobs and are generating over $50 million in new exports every year. While LAAD is itself a somewhat unique organization, the type of service here provided is commonly extended by a wide array of processing firms vertically linked to small and medium agricultural producers. Thus, an essential part of implementation might be facilitating the development of this relationship in appropriate cases.

An example of a LAAD subsidiary in Guatemala points up how an agribusiness firm, in this case, a rice mill, can link up to small farmers and resolve problems such as credit and input. The mill made an effort to buy from small

Sources frequently overlooked in the implementation phase by field Missions, but ones that have been successfully adopted in some countries, are local institutions. On all projects, a determination should be made regarding local capacity to resolve most, if not all, of the barriers to rural development. This would include hiring or contracting under the project the service of local business schools, development and regular commercial banks, credit unions, marketing and production cooperatives, subsidiaries of multinational firms, indigenous private sector firms and universities. All these are possible sources of managerial and technical personnel and could be utilized in both the design and implementation phase.

D. Project Management

Implementation requires management skills and in this respect stands in sharp contrast to the other stages in a project's life which require analytical skills. Project management presents many challenges, some of which an international development agency like A.I.D. is not inherently equipped to confront.[15.21] Management presents a problem due in part to the concern that for many projects, indigenous management is not sufficiently trained to

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farmers. During the crop year that ended in July 1978, 380 small farmers supplied 80-85% of the 12,400 metric tons of rice the mill bought. The steady and assured supply of raw material has allowed the rice mill to continue to meet the demands of a growing market.

The advantage of this case was that it benefited both farmer and miller. The mill used its position and contacts in the industry to supply its growers with the proper seed. This not only improved the chances of a good harvest and increased income for the farmer, but also provided needed supplies. In addition, the mill used its sound financial condition to extend credit to the farmer. The mill had to borrow to meet its cash requirements both at the beginning of the crop year, when it had to buy seed and extend cash credit to farmers, and at harvest, when it paid farmers in cash. However, financial institutions did not have the reservations about lending to a secure company that they would have had about lending to 380 individual small producers. The extension of credit served to strengthen the bond between farmer and miller. The only collateral the rice mill had was the contract to deliver rice, but the farmer had every incentive to fulfill that contract. The guaranteed price removed any incentive the farmer might have had to sell to other sources. Also, fulfillment of this year's contract would put the grower in a position to benefit from company services again the next year. This would help explain why in six years of operation (in 1978 the mill extended over $100,000 in credits and loans), the mill had lost only $500. This small farmer procurement system is an example of the ability of a private sector enterprise to find and implement solutions to the problems of agricultural development. Ray A. Goldberg and Timothy Mooney, *Arrocera Zacapaneca* (Boston, Massachusetts: Harvard Business School, 1979).

Other mechanisms would be the cooperative development organizations such as ACDI, CLUSA, and CUNA. These organizations have a great deal of agribusiness managerial know-how and if properly utilized beginning from the design phase, could provide excellent input at the implementation stage.

15.21/ Rondinelli et al. have shown that management and project administration difficulties appear in almost all projects. Their paper reviews some of the major criticisms of project administration by international assistance agencies in an attempt to bring to light some of the management and administrative problems which these agencies must overcome in order to make projects effective vehicles for promoting socioeconomic development. The authors have identified two broad categories of findings with varying policy implications. First they observe that knowledge of major implementation problems does exist within assistance organizations. However, this knowledge is not effectively utilized due to difficulties in finding the means to increase organizational learning. Second, they suggest that a diagnostic study can be used to identify major problems or deficiencies that can affect project success through succeeding stages in important ways. See Dennis A. Rondinelli and H. Raymond Radosevich, *A Study of Development Project Administration: Diagnostics for Improved Implementation* (Memphis, Tennessee: Vanderbilt University, 1975).

Israel, of the World Bank Staff, outlines the management problems of project implementation as follows:

"What then are the major or moderate implementation problems? The most pervasive and persistent seem to relate to 'management.' They are generally hard to define but could be said to encompass most of what are usually considered institutional problems. The central problem is lack of managerial capacity, defined as the ability to plan and execute a specific action program at two levels: (1) in the government administration, a situation that affects all projects in a country; and (2) in the project's management. Other facets of this problem are a dearth of several types of skilled manpower (accountants, technicians, economists) as well as those with general administrative capabilities; inadequate administrative methods and procedures; ill-defined organizational setups; and lack of coordination among agencies. The definition has sometimes been stretched to include restrictive salary policies and inefficient regulations." Israel of the World Bank Staff, "Toward Better Project Implementation," March, 1978.

Other important sources on this topic are: Robert Iverson, "Identifying and Eliminating the Managerial Constraints to Development" (Syracuse, New York: Maxwell Training and Development Programs, Syracuse University, 1976) (mimeographed); Jon R. Moris, "The Transferability of Western Management Concepts and Programs, an East African Perspective," in *Education and Training for Public Sector Management in the Developing Countries,* The Rockefeller Foundation, March, 1977, pp. 73-83.

handle the project implementation process.[15.22] This section deals with selected management topics relevant to agribusiness and rural enterprise projects.[15.23]

1. Participation in Project Management

A common thread running through much of the recent legislation and literature of development policy involves the topic of local "participation." As it relates to agribusiness and rural enterprise projects, "participation" means the participation of beneficiaries (entrepreneurs and benefited families) in both the benefits and the management process of the project. Project decisions should involve participating entrepreneurs and producing families to the extent possible. A number of both theoretical and field studies have indicated the importance of participation in insuring eventual project success.[15.24]

As a practical matter it is easier to involve local participants in project design than in project implementation and administration. Obtaining the ideas of local small scale entrepreneurs about existing critical constraints and potential solutions to their problems is an integral part of the analysis process outlined in Chapter Seven. Gleaning local ideas and perspectives in a survey is a much easier process than involving a widely disperse and heterogeneous

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15.22/ "*Management Requirements:* During the initial phases of enterprise development, relatively sophisticated management skills are required which are frequently not available in the area. Technoserve has found that it must provide the personnel possessing such skills while the enterprise is maturing and train local management to take over these responsibilities." See Technoserve, *Lessons Learned*, Norwalk, Connecticut, 1977.

15.23/ Koteen identifies four major problems in development administration. These include

a. The shortage of qualified managerial manpower which is essential to the promotion of development programs.
b. The need for introducing relevant improvements in institutions which can play key roles in development.
c. Inadequacy in existing project management systems.
d. The lack of effective action at the local level—primarily by the functionaries and representatives of different departments at that level.

The points raised in this discussion have important policy implications. They include the need for expanding management training (preferably a large portion of this at the middle-management level), the need for improving the content of the training material so as to better meet the needs of the developing countries, and an emphasis on effective institution building and active local participation. See Jack Koteen, "Key Problems in Development Administration," in *Administrative Issues in Developing Economies*, Kenneth J. Rothwell, ed. (Lexington, Massachusetts: D. C. Heath and Company, 1972)

15.24/ Technoserve states relative to participant involvement in rural enterprise projects: "*(Local) Sponsor Groups:* The most important variables in the enterprise development process are the initiative, dedication and leadership of the (local) sponsor groups. *Local Initiative:* Enterprises can only be assisted in response to local initiatives on the part of the people who will be the most directly involved in the development process. This is a primary means of determining the consistency of the enterprise with local goals and aspirations. *Monetary Commitment:* The initial investment of funds in the enterprise must come from the (local) group. This commitment is an indicator of the determination of the (local) sponsor group and is one means of insuring that the enterprise remains 'theirs' as it develops. Technoserve can assist in identifying other sources of capital, but only after the initial investment has been made." *Ibid.*, p. 46. Morss et al. suggest that project success in small farmer projects reviewed in their study was clearly influenced by the small farmers' involvement in the decision-making process during the design and implementation phases, and by their support given to the project in terms of contributing development resources. These findings imply that development projects must have sufficient provision for effective local participation, both in terms of decision making and in terms of securing the essential local support for the project. See Elliot R. Morss et al., *Strategies for Small Farmer Development: An Empirical Study of Rural Development Projects* (Washington, D.C.: Development Alternatives, Inc., 1975). Marson has attempted to show by a review of A.I.D. project documentation in Southeast Asia that failures in certain development projects can be attributed to differences in values between the project designers and implementors and the people who the project is supposed to benefit. He states that many of the key actors involved in the planning and implementing of development programs are not sensitive to cross-cultural value differences which may cause suboptimal program outcomes, or outright project failure, since a project may carry values which are alien to the beneficiaries. Participation by locals in project decision-making and management would presumably integrate their value systems and overcome the problems identified by Marson. See D. Brian Marson, "Dissimilar Value Commitments and the Dynamics of Development Administration," in *Thai Journal of Development Administration*, October, 1971. Esman, French, Vengroff and Coralie have all added to the evidence and theory of participant involvement and its importance for project success. See Milton Esman, "Development Administration and Constituency Organization," *Public Administration Review*, 38 (March-April, 1978), pp. 166-172; Jerome T. French, *Participative Aspects of Community Level Programs: Summary Conclusions and Recommendations*, prepared for the Agency for International Development, Washington, D.C., 1969; R. Vengroff, "Popular Participation and the Administration of Rural Development: The Case of Botswana, in *Human Organization*, 33 (1974), pp. 303-309; and Coralie Bryant, *Participation, Planning and Administrative Development in Urban Development Programs*, prepared for the Agency for International Development, Washington, D.C., 1976.

group of small scale entrepreneurs in the day-to-day work of project implementation. If only a handful of enterprises is involved, as would be the case in most PVO projects, or in the case of large-scale agroindustrial projects, this difficulty is lessened and intimate involvement of local entrepreneurs in the decisionmaking process is more feasible. Participatory management where large numbers of local families are involved presents practical management difficulties, yet the evidence of its importance[15.25] encourages project planners to move in this direction as rapidly as possible.

"Participation," of course, organized or not, is the result of implementation of rural enterprise and agribusiness projects; simply because they operate directly with the private sector, local individuals must participate.[15.26]

15.25/ The most often referenced study which implies that participation is the principal determinant of success in rural development projects has been the subject of much discussion on methodology. While it is obvious to most analysts and practitioners that involving local participants in project decisions is useful, it is not so clear that the Morss study (see footnote 20) provides empirical proof of the influence of participation on project success. One of the difficulties lies in the circularity of reasoning in which "success" is defined in such a way that many of the elements of local participation (self help, self sustaining, etc.) are at once the definition of success and one of its explanatory causes.

"The results indicated that 49% of the variation in overall success could be explained by variation in local action. In order to understand the meaning of this finding we must explore the definitions of the two related variables. 'Overall success' is made up of four component factors: an index of income/costs, an index of agricultural knowledge which measured farmers' individual acquisition of information, an index of the degree of self help which measures 'benefits obtained from group participation, formal or informal, which complement the project's economic activities,' and a self sustaining index which measures 'the ability of the project to draw upon increased income from project costs paid for by domestic sources.'

Having explored what is defined as the explanatory factor, we must now understand what is meant by the explained factor 'local action.' As the definitions are read, watch carefully for tautology. Is the thing explained simply a different way of stating the factor which is posited to explain it?

We start by defining local action. By this term, we refer to two types of small farmer activity. The first relates to his involvement in project decision-making in: (a) the idea evolution and project design phase; and (b) the project implementation phase. The second type of small farmer activity in local action relates to the resource commitment he makes to the project defined as:

- The ratio of the value of the increased family labor commitment to family income
- The ratio of his increased money commitment to family income
- The sum of the above two ratios (called total resource commitment)

Following standardization of the four independent measures, their values were added together. The resulting sum was then taken as our comprehensive measure of local action." Morss et al., *Strategies, op cit.*, p. 46.

15.26/ Metcalfe of Technoserve provides the following perspective on participation in the context of rural enterprises.

"First, as a 'practical matter,' it is necessary to involve local entrepreneurs or project sponsors in both project design *and* project implementation. If they are not involved in project implementation in a very substantive way, they may not either take or understand the business risks they are subject to, and if they are not involved in project implementation, the project will become the albatross of the technical assistance agency. No rural enterprise should be implemented that cannot be owned, operated and controlled in a socially and economically viable manner by the project sponsors and/or the rural communities that largely determine whether the enterprises will or will not be viable. While the work of the technical assistance agency must be modified to take into account its experience in assisting rural enterprises, it is not necessary nor particularly desirable to involve the project sponsors in decisions affecting the administration and operation of the technical assistance agency. The response of enterprise project sponsors will automatically (or should automatically) inform the technical assistance agency how best to deliver its services/resources, and will also define over time the flexibility required to improve the delivery system.

At the enterprise development level, the concept of partnership of shared risk is more useful than the vague concept 'participation.' Partnership implies mutual respect and trust between relative equals. The technical assistance advisor must be disposed to being well-used by the people served, and the people served must be disposed to carefully considering and accepting the pragmatic recommendations/intervention of the advisor to enhance the potential for the socially and economically viable implementation of the enterprises involved. In the last several years, reasonable policies and attitudes to meet the needs of rural populations on their terms has led to soft-headed handwringing notions of participatory decisionmaking. This may be well and good in infrastructure and community development projects, but it is unworkable and ineffective in most rural enterprise projects, be they corporations or cooperatives.

Participation, like technology, should foster the logical, pragmatic organization and use of knowledge and people to achieve practical purposes. This is especially true when participation is based on self-help (risk taking) and self-sustaining (local control and capacity for same) principles. Democratic decisionmaking in the business environment is an important principle requiring careful analysis. It should not arbitrarily be made a mandate or rule vis-a-vis business decisionmaking, leadership/management selection, appropriate delivery of technical assistance. Participation from the viewpoint of most people affected by or who themselves affect rural enterprises ought to be analyzed pragmatically to assure that the component parts of participation are carefully distinguished and dealt with. Farmer suppliers should/must be given the opportunity to negotiate the terms and conditions by which they will buy inputs or sell their products to the rural enterprise; the shareholders should determine who among them they wish to set policies and business priorities as members of the Board of Directors; the decisionmaking responsibilities of the Board of Directors are different than the day-to-day decisionmaking authority and responsibility that must be vested in management; the technical assistance agency must delineate between such levels of participation and in greater or lesser degrees be itself involved and/or fully cognizant of the decisionmaking processes involved.

Participation is a question of 'fit' with respect to the business activity involved and the formal/informal pragmatic linkages between suppliers, entrepreneurs/enterprise sponsor groups and consumers." Metcalfe, *Recommendations, op. cit.*, pp. 15-16.

2. *Personnel Management and Training*

The most obvious gap in all implementation processes is the availability of capable and motivated people to manage. Even a poorly designed project in the hands of effectively trained and motivated managers has a very good chance of success. It is important that the dominating influence of individual managers not be overlooked.

While the capacity of local managers is an important constraint,[15.27] it is also true that there are many capable people in most developing countries[15.28] who may be drawn to project management tasks if there is sufficient incentive and initiative on the part of the project itself. While it is unlikely that there is any simple solution to this problem, an important contribution is a personnel management plan integrated into the project design. It is unfortunate that while almost all development analysts recognize the importance of personnel management, it is rare indeed that a project design devotes much time or energy to a personnel management and incentives plan. "Personnel" as a subject matter is dealt with as one of the four or five standard blocks of management knowledge taught at management schools, yet as a subject in project design it is almost always ignored. There is seldom any systematic plan for insuring that the best knowledge in the "personnel" field is employed to contribute to project success.[15.29]

Where capability of management and implementation personnel, however selected, is weak, a training component will be a vital part of the project design. Funding and planning will be required to make the training component an efficient and effective tool for improving project implementation.[15.30]

Implementation is more likely to be affected by its success or failure in attracting competent management than any other single factor.[15.31] Analysis of institutional competence will not substitute for personnel analysis. The competence of the handful of individuals who end up managing the project, and not the general competence of the organizations involved, will probably be the predominant factor influencing the success of project implementation.[15.32]

15.27/ For a discussion of this scarcity, see Robert Chambers, "Executive Capacity as a Scarce Resource," in *International Development Review*, Volume II (June, 1969).

15.28/ Technoserve focuses on this issue as follows: "While many low income countries have limited resources at their disposal, those that do exist are frequently under utilized. Nearly any country has a local base of ... energetic local leaders and groups eager to develop their own enterprises. The challenge is to bring together these available resources in such a way as to create economically viable enterprises benefiting the people involved in their operation." Technoserve, *Lessons Learned, op. cit.*, p. 47.

15.29/ An approach to applying personnel management knowledge to the problems of the development process can be found in United Nations, *New Approaches to Personnel Policy for Development* (New York: Department of Economic and Social Affairs, Division of Public Administration and Finance, 1974).

15.30/ Discussion of design and planning considerations for training programs in project management may be found in the following sources: Edgar Owens, "Training Administrators for Rural Agricultural Institutions," in I. Swerdlow and M. Ingle, eds., *Public Administration Training for the Less Developed Countries* (Syracuse, New York: The Maxwell School of Syracuse University, 1974); Morris Solomon, Flemming Heegaard, and Kenneth Kornher, "An Action-Training Strategy for Project Management," *International Development Review*, 20 (1978), pp. 13-20; East-West Center, Technology and Development Institute, "Public Policy Implementation and Project Management—Curriculum Development for Project Management," Summary Report of the Workshop to Critique and Refine Prototype Curriculum Package, June 20-30, 1977.

15.31/ The importance of personnel considerations is underscored by Technoserve. "Personnel considerations and the related selection and training of appropriate managerial and supervisory personnel is probably the most important factor to be dealt with in the implementation and operation of agribusiness and rural enterprise projects. If this factor is to be dealt with and appropriately handled in the partnership between the enterprise sponsors and the technical assistance agency, the technical assistance agency must work doubly hard to assure that its personnel are able to effectively advise and appropriately influence personnel decisions at the enterprise level. In the early stages/years of high-risk rural enterprise operations, the capability to identify, use and/or train enterprise personnel on the job is the most important factor impacting on the social and economic viability of the businesses assisted." Metcalfe, *Recommendations, op. cit.*, p. 16.

15.32/ A PVO viewpoint on organizational capacity is given in the following from Technoserve: "Organizations don't have competence, people do. When people work in an integrated, systematic manner, the organizations involved are effective and successful. ... Competence is primarily a function of personnel capability, and not systems, manuals, cookbooks, etc., people come and go, change jobs, etc. Thus the elusive 'stuff' called corporate knowledge requires that both individuals, systems and operational procedures be developed, updated, passed on and utilized to the direct benefit of rural enterprise sponsors and the personnel in technical assistance agencies. It's a question of both/and, not one or the other." *Ibid.*, p. 16.

3. *Formal Project Management Systems*

Many of the informal elements of project management knowledge have been incorporated into formal management systems. These tools are aimed at providing effective management control and information.[15.33] Where logistics represent a large relative part of the burden of project implementation these techniques are of comparatively greater utility. Projects may benefit from the explicit inclusion of one or more of these formalized systems into their implementation plan.

E. *Project Monitoring*

1. *Monitoring Institutional Development*

An important element in most agribusiness and rural enterprise projects is an institution building focus which seeks to strengthen an existing institution, or in some cases to build a new one. Monitoring the progress of these institution building objectives differs so widely, depending on the particular institutional aspects to be assisted, that general guidelines on method would be virtually useless. Specific objectives and targets should be set and the performance on these targets should be tracked.

Much more can be said about monitoring non-institution building objectives of the project. Section B outlines for different project types the kinds of analysis which may be conducted to support monitoring during the implementation phase.

In many ways adequate monitoring implies a flow of information which allows for serious mini-evaluations of project progress. The possibility that such mini-evaluations could be based on significant statistical findings of project impact in the field is very slight. The simple realities of A.I.D. field administration precludes this from happening. What is possible is to structure those elements of the evaluation design that are practical into a monitoring system. Two major segments of this monitoring system are explored below; first a system to track intermediate flows of goods and services, and secondly some modest tracking of final household and enterprise level impacts.

15.33/ The following list of formal project management systems provides the interested project designer with both information and institutional sources for these systems: D. Belshaw and R. Chambers, *PIM: A Practical Management System for Implementing Rural Development Programmes and Projects* (Nairobi, Kenya: Institute for Development Studies, University of Nairobi, 1973), Discussion Paper No. 62; H. H. A. Chabala, D. H. Khru, and S. W. Mukuna, *A Further Evaluation of the Programming and Implementation Management (PIM) System* (Nairobi, Kenya: Institute for Development Studies, University of Nairobi, 1973), Working Paper No. 119; H. H. A. Chabala, D. H. Khru, S. W. Mukuna, and D. K. Leonard, *An Evaluation of the Programming and Implementation Management (PIM) System* (Nairobi, Kenya: Institute for Development Studies, University of Nairobi, 1973), Working Paper No. 89; Peter Delp, Arne Thesen, Juzar Motiwalla, and Neelakantan Seshadri, *System Tools for Project Planning* (Bloomington, Indiana: International Development Institute, Indiana University, 1977); Practical Concepts, Incorporated, *The African Bureau Project Management System: Manual of Operations*, Phases I and II Final Reports, under U.S. Agency for International Development Contract No. AID/CM-otr-C-200, 1975; Practical Concepts, Incorporated, "The P/C/I Model: Some Practical Concepts for Assessing Organizational Viability," International Development, December, 1974; Practical Concepts, Incorporated, "Project Design and Evaluation Concepts: The Logical Framework Approach," Mimeographed, 1977; Practical Concepts, Incorporated, "Project Performance Assessment and Tracking," Mimeographed, 1976; Practical Concepts, Incorporated, "Summary of PCI's Project Management System (PMS) Concepts," Mimeographed, 1977b; H. Raymond Radovich, "Development Project Management: An Integrated Approach to Project Planning and Implementation," *Planning Processes for Project Management*, Volume 1 (Graduate School of Management, Vanderbilt University, February, 1974.

2. *Monitoring Intermediate Flows of Goods and Services*

The project log-frame contains the basic logical structure for fleshing out a monitoring design. Projects are based on the assumption that outreach will take place and that it will be appropriate in nature and quality. These two simple assumptions which appear in different forms in most project log-frames provide the basis for a sufficiiently complex monitoring system to adequately track the "intermediate" part of project objectives.

a. Monitoring Service Outreach

The first element which may require analysis and data to monitor is the actual outreach of services. While this may be simple in concept, it will require a system of information flow to be established in the implementing entity which records the numbers of visits to enterprises, the numbers of training courses given with the numbers of participants, the number of demonstration trials and their attendance. It is not unusual for the A.I.D. monitor to be without this information even after many months of implementation. Monthly or at least quarterly progress reports with these standard figures in them would be an improvement over most TA monitoring systems.

b. Monitoring the Quality of Services

The ultimate test of the appropriateness and quality of services is the impact on the enterprise and the household income of participants. There are, however, other tests and data which can be used to monitor this quality. Spot checks on the quality may be made by the A.I.D. monitor, or contract personnel in charge of the training of extension or outreach agents. If they are unable to formulate a system for judging the quality of the final service it is unlikely that they know enough about the process to implement a useful program. If these spot checks on TA visits, courses, and demonstrations could be randomized, their results would give the A.I.D. monitor a reasonably good idea of the gradual change in quality of the services.

3. *Monitoring the Final Impacts of Interventions in Agribusiness and Rural Enterprise Projects*

Tracking the final impacts of projects during the implementation stage has a number of problems. First, it is probably true that the final impacts on households would not mature in the early stages of project implementation. Secondly, even after they do begin to mature, it is largely inappropriate to evaluate such impacts as a part of the monitoring system, since such a mid-course evaluation is probably already built into the project evaluation plan. The role of monitoring final impacts during project implementation may be seen, however, as providing a different perspective on final results than a mid-course project evaluation. It may, in fact, be very useful to begin gathering data on final impacts even before it is expected that there will be any resulting from project inputs.

a. Final Impact Monitoring as a Method of Improving the Quality of Services

A useful objective of early monitoring of final project impacts on enterprises and households is that the very process of gathering the data and training project personnel to interpret and utilize such data will have an impact on the quality of the technical services. Designing the type of TA services (the "Technical Package") is not an easy process. For agribusiness and rural enterprise projects the package is likely to depend on the type of enterprise, the stage in its entrepreneurial development and many other factors. A frequent danger in Technical Assistance interventions is that the package may be a poor fit with the needs of the target group. An adequately designed monitoring system which seeks to identify how TA services are actually changing and improving the business can be one of the best ways of "tuning" the technical package. One would not expect to see changes in the enterprise operations or in household income during the first few months of project implementation. The operation of a household level impact monitoring system, however, will probably have a significant impact on the quality and perhaps even the structure of the services themselves. A good TA project design may already have this element of impact measurement as a part of its own internal operation to get feedback from entrepreneurs and to identify where its services are resulting in concrete improvements. In this event the monitoring system for A.I.D. need only be a monthly or quarterly report selecting the most important indicators from the internal impact tracking system.

b. Methods for Final Impact Monitoring

It has been earlier said that impact monitoring is much like a mini-project evaluation. This may be extended to say that the basic methods outlined for the project evaluation should be used in the monitoring stage. The instruments designed to measure final impact and project success should be applied in miniature to serve as impact monitoring tools. If a control group survey is contemplated as the evaluation tool, the same questionnaires, indicators, etc., could be used as monitoring tools but administered to a reduced number of enterprises and without particularly complex elements.

As the project progresses over time the monitoring results will blend into the evaluation design. Not only will final impact measurement enhance implementation by signaling changes in focus, but it should build a serious basis for evaluation.

CHAPTER SIXTEEN: EVALUATING AGRIBUSINESS AND RURAL ENTERPRISE PROJECTS

A. General Purposes and Problems in Project Evaluation

The most immediate purpose of evaluation is to determine the effectiveness of a particular project. The evaluation should be planned around the Logical Framework which states project purpose and goal level indicators. These LOGFRAME indicators should be used to evaluate project performance and to provide a structure for the evaluation effort since in a sense the LOGFRAME may be viewed as a plan for evaluation at a general level. Evaluation efforts may be undertaken during the course of the project to provide project managers with mid-course information on project performance and may lead to changes in the ongoing project.

1. Project Design Guidance from Project Evaluation

Beyond the obvious need to ongoing and final information on project performance and success, there are other potentials in the project evaluation process.

Designing effective projects requires a wide variety of information about project potentials and implementation mechanisms which will work in practice. All international agencies have expended considerable effort to improve their project design work. Additional analysis is conducted before making project funding decisions to assure that the project has a good chance of making a cost effective contribution. There are, however, many strong factors which hinder pre-project analysis and have rendered it relatively impotent in practice. This section argues that for both practical and conceptual reasons, adequate evaluation of prior projects of similar type usually benefits project design more than an analysis undertaken during the project design.

2. Time Pressure and Limited Funds in the Design Phase

Project design analysis is not likely to be as useful as prior project evaluations, since the A.I.D. programming cycle forces project design into a time and resource scarce framework. There is often little chance of undertaking the necessary data collection and analytical activities necessary to illuminate wise project choices. Annual budget allotments, the project identification and review cycle, and the ever present necessity to obligate funds all make the possibility of depressurizing the project design and approval process unlikely and perhaps even unadvisable for many organizational and management reasons.

But, although it may be virtually impossible to improve project design significantly, project evaluation is not limited by the same constraints. Evaluation is different from design both in terms of time pressure and limitations on resources. Most projects in A.I.D. have 2-5 year time horizons and most project reviewing bodies readily accept the fact that project impacts may take at least a year beyond disbursement to be felt. There is sufficient time available in A.I.D.'s project cycle to design and implement serious evaluations.

3. Evaluation is Conceptually the Ideal Setting for Obtaining Project Design Information

The third, and perhaps most convincing reason for emphasizing evaluation analysis, even at the expense of design analysis, is that evaluation is conducted under the situation which would be ideal for design analysis. In project design the analyst wishes to determine what will work, to estimate the potential impacts of doing one project as opposed to another, or doing the project one way as opposed to another. In the design stage, project potential can be estimated either by the educated guesses of experts or by the analyzed experience of past interventions. Certainly time will not permit the project designer to analyze past interventions carefully if that work has not already been done; s/he must rely upon his/her own best guess, which can hardly be classified as design "analysis." If effective project evaluation information is not available, project design analysis must be shallow because there is no analytical setting for the design analyst to test his/her bald hypothesis. Effective evaluation would gradually build a reservoir of project impact and design information which would reduce the burden of pre-project analysis and would help alleviate the bureaucratic and practical problems which beset the A.I.D. programming cycle.

Many A.I.D. officials have spoken about the need to develop an institutional memory which learns from its experience. Project evaluation analysis is the core of this vitally important activity.

B. Evaluation of Final Project Impacts on Target Group Household

1. The Causation Chain

For the purposes of evaluation, it is useful to outline a chain of events which causes a project intervention to have a favorable impact on target group households. While any causation chain involving human behavior is endlessly complex in reality, simplified versions which are admittedly lacking in accuracy may help to structure an analytical process. A general project chain for agribusiness and rural enterprise projects is outlined as follows into impacts or changes which occur at three different and sequential levels:

1. Institutional level—an institution lends credit or provides technical assistance.
2. Enterprise level—the enterprise increases its output with the increased credit, or its efficiency with the technical assistance.
3. Households level—the household members obtain more net income or live in a better home as a result of the increased efficiency or output.

The examples are only illustrative, but the three levels defined above can be used to fit most, if not all, rural enterprise projects.

This particular conception of the causation chain is most useful because it provides a structure for evaluation and fits neatly into the Logical Framework which is an already functioning part of the project programming cycle and documentation. Each of these levels should include an evaluation component so that results can be used to draw judgments about the performance of the project evaluated, and to provide project design guidance for the future.

2. *The Importance of Focusing Evaluation on Family Level Impacts*

a. *Congressional Mandate or New Directions*

The congressional mandate or "new directions" philosophy requires that A.I.D.'s projects seek to demonstrate an improvement in the welfare of poor families. Too many decades of effort have gone by with attention to institutional changes, but with insufficient evidence of improvements at the family level.

b. *Family Level Evaluations Imply Satisfactory Evaluations at the Institutional and Enterprise Levels*

If an evaluation does an acceptable job of measuring and evaluating family level impacts, evaluation of earlier links in the causation chain (institutional interventions and enterprise impacts) are implied. It would be conceptually and operationally impossible to determine adequately what the final level impacts of a project are without making the necessary connections to intermediate enterprise and institutional factors. The converse, however, is not true. It is very possible to review institutional change without ever measuring any family level impacts whatsoever In practice almost all existing A.I.D. evaluations are of this latter type. They examine (adequately or inadequately) institutional performance without any measurement of what impact was actually sustained at the enterprise or family level.

c. *Family Impact Evaluations Provide the Needed Project Design Guidance for Future Projects*

The third reason to focus evaluation at the family impact level is that a knowledge of what institutional interventions really cause improvements in family welfare is the missing piece of project design information most needed in A.I.D. Much is known and discussed in the literature of A.I.D.'s development about what institutional instruments are available and how to use and adjust them, but there is only a handful of actual measurements of the family welfare impacts of these interventions. As mentioned above, project design is the activity with an appetite for this information, but for bureaucratic, organizational, and conceptual reasons must rely on evaluation analysis as its source of intelligence.

3. *Evaluation of Family Impacts Inside a Systems Framework*

Family income and other welfare for the rural poor engaged in agribusiness and other small scale enterprises do not derive exclusively from these enterprises. Employment in other activities such as a family farm or outside family-owned businesses represents an important source of welfare. Changes in the family enterprise must be viewed inside a larger system or the results of evaluation may be misleading. For example, family income may actually be reduced by an increase in income from the family enterprise if this increase comes from displacing family resources (labor or financial) from other pursuits.

4. *Enterprise Systems*

All agribusiness and rural enterprise projects attempt to make some type of change in an enterprise to increase the welfare of its owners or workers. While small scale enterprises may be of limited scale, they are nevertheless complicated businesses with many resources and subactivities. An intervention or change in one part of the business may cause changes in another. It is, therefore, important that change be viewed as a system phenomenon. Resources, modern inputs, and credit are all fungible at the enterprise level. It is not enough simply to identify whether the project intervention has been completed (such as credit disbursed, technical assistance given, etc.). It is also necessary to identify if the expected, or some other positive change, has resulted in the enterprise system.

5. *Institution and Project Inputs*

In addition to evaluating the impact of the project on the enterprise, evaluation is needed of the institutional process by which project inputs or interventions are provided to the target enterprises. Much less quantitative precision is needed at the institutional level, but corresponding increases are required in the organizational sophistication of the evaluation design and much higher levels of local awareness are necessary in the personnel conducting the institutional evaluation segment.

C. *Data for Evaluation*

The importance of original project data for evaluation cannot be overemphasized. Almost all evaluations proceed without any direct data on project enterprises or households. Data gathering from households and enterprises in developing countries is a difficult and painstaking process; as long as evaluations are accepted which avoid this extra effort, there are few incentives to undertake it. A review of most project evaluation documents reveals that evaluators saw their role as interviewing host country and A.I.D. officials to glean their opinions as to what happened. This collection of official impressions and opinions, linked with at times insightful observations about the institutional process, have come to be accepted as adequate "Project Evaluations." There are exceptions to this general rule, and it is important to note that these exceptions are more distinguished from the rule by the data they gathered than by the methods they used to analyze it. The gathering of the basic data, not its interpretation, is the hardest part of an adequate evaluation. More effort needs to be made in developing usable data gathering

methods than in refining statistical techniques for evaluation analysis. If the data gathering effort is poorly structured and inadequately controlled, no amount of sophisticated analysis will be able to salvage usable results.

The core of a good evaluation is an appropriately designed and carefully managed original data gathering process at the enterprise level. While many other elements are necessary, this segment will carry the system if done correctly, and ruin it if done incorrectly.

The central issues which A.I.D. agribusiness and rural enterprise project evaluation must focus upon are few and should not be lost as discussion seeks its simplest outlet in institutional and organizational examinations. The objective of evaluation should be to determine if target households and enterprises obtained increased income and non-income welfare as a result of the project intervention. Since the impact to be measured is at the household and enterprise level, the achievement of these objectives requires household and enterprise level data.

I. Measuring Impact and Causation by Comparison

The most practical method to determine whether project objectives have been achieved in target households, enterprises, or institutions is by using comparisons. This is both an analytical and a data gathering method. The data themselves must be gathered in such a way as to permit the correct comparisons. The comparing task is that of gathering comparable data and comparing the right things at the right time. The analytical methods described in the next section add very little to the comparisons which could be made in the raw data if it is gathered correctly.

a. Strengths of "Comparison" as a Method for Households and Enterprises

Of the three levels, comparisons function best at the enterprise and household level simply because large numbers of both will probably be excluded from project participation. There are two reasons why larger numbers of observation units (households or enterprises) make results of any analysis more believable. The first reason is simple logic. The more cases that fit the rule or the finding, the more secure one feels in the finding itself. The statistical correlary to this intuitive judgment reveals that results obtained on samples of certain reduced numbers of observations lack reliability when generalized or extended to cover the whole population from which the sample is drawn and which it was to represent.

b. Types of Evaluation Comparisons

There are basically two types of comparisons which can be harnessed to provide conclusions on project impacts for evaluation purposes. The first is comparisons of project participant households, enterprises, or institutions over time in "before and after" fashion. The second is comparisons between participants and nonparticipants with similar characteristics. In the first type (over time comparisons) we are attempting to see if the project has changed the participant entity from what it was before, with the implication (later to be examined) that the difference is "caused" by the project. This type of comparison of the same household, enterprise or institution over time is termed a "longitudinal" comparison.

In the other case, where participant enterprises are compared with similar nonparticipant enterprises, we wish to observe differences, which by implication are "caused" by the project, since it is the only difference between the two enterprises. This comparison made at the same point in time between two different households, or enterprises, is termed a "cross-sectional" comparison.

In both the longitudinal and the cross-sectional comparison, the analyst and data gatherer are trying to isolate project influences from the endless other influences which may change households or enterprises, in order to identify changes which are reasonably "caused" by the project.

Since no one believes in single factor causation, that is, that any effect is "caused" by any single factor, the project evaluator is not looking for what a logician may term true "cause." Instead, evaluation analyzes "project associated impacts," "changes related to this project," or changes "strongly influenced" by the project.

The process of isolating project influences from all others is an imperfect one, but it is an inescapable struggle if project choices are to be enlightened by project experience. The discussion which follows outlines the logic and explains the procedure by which various types of comparisons may be used to draw project impact conclusions or inferences.

2. *Using Longitudinal Comparisons to Evaluate Project Impacts: Endogenous Control of the Enterprise*

The basic design of a longitudinal comparison for evaluating the impact of a project on rural enterprises or households would begin with what is most often called "base line" information on the participant enterprises or households. Let us simplify the impact which is to be measured in order to explore the data gathering technique. Assume that we wish to measure the impact of the project intervention on the amount of production in participant rural enterprises. To obtain a comparison of what the project has done to production levels, we would select the requisite numbers of randomly drawn enterprises. (The methods for sampling and survey administration are not discussed in this section; see Part VII, Data for Enterprise Analysis). We would then go to each enterprise at the end of the year, before their entry into the project, and obtain from the entrepreneur the amount of production in that year. Then each year after project commencement, we would return to the same group of participant enterprises and obtain the same information for each ensuing year. If production had increased by 40% each year we might say the project had been a success. The basic comparison is over time. There are, however, other factors changing in the environment of the enterprise which may be influencing the levels of production which have nothing to do with project interventions. Credit may have become scarce and more costly in nonproject channels, or prices may have made production more profitable and hence more attractive. The weakness of all longitudinal comparisons which take place outside the laboratory or experiment farm is simply that exogenous (outside the enterprise) changes may invalidate or distort the association between the observed change and project interventions. Longitudinal comparisons control the enterprise by insisting that the same one be observed over time. We still deal with the same enterprises, but fail to control the changes in the environment.

3. *Cross-sectional Comparisons between Participant and Similar Nonparticipant Enterprises: Exogenous Control of the Environment*

Cross-sectional comparisons between participant and similar but nonparticipant enterprises have almost a mirror image of strengths and weaknesses to a longitudinal comparison. In a cross-sectional comparison we would select a group of enterprises which was about to participate in the project, and match these enterprises with similar enterprises which were not going to participate. This group of nonparticipant enterprises is commonly called a control group. No comparisons would be made between the two groups until after the project had been implemented because they are by definition similar before the project starts. The comparison after project implementation would not be with the status of participant enterprises before the project as was the case in the longitudinal comparison, but rather between the participant and nonparticipant enterprises. The idea of the cross-sectional comparison is that the only difference between the two groups is participation in the project, and therefore if production in participant enterprises is larger it should be due to their participation.

Since cross-sectional comparisons are taken at the same point in time, there is no distortion from over time changes in the environment, fluctuations in demand, prices and all the other factors influencing the enterprise from outside. These factors are constant for both participant and nonparticipant groups because the comparison is made at the same point in time.

The lack of exogenous (changes over time in factors outside the enterprise) distorting influences is the principal strength of cross-sectional comparisons, in contrast to the longitudinal comparison where it was the principal weakness The principal weakness, however, of cross-sectional comparisons is that they admit distortion based on uncontrollable differences inside the firm between the participant and nonparticipant groups. It is impossible to match participant and nonparticipant control groups so well that the only difference between them is participation in the project. Therefore, it is always possible that a difference in some objective like amount of production measured between the participant and nonparticipant control group is not due to participation, but to some internal difference inside the enterprises which is not project caused.

4. *Combining Longitudinal and Cross-sectional Comparisons*

The strengths and weaknesses of the two comparison methods, longitudinal (over time) and cross sectional, are exact mirror images of each other. Over time comparisons hold internal enterprise characteristics constant by using the same firm before and after, but outside influences may change besides the project and distort the findings. Cross-sectional comparisons hold outside influences constant by taking both measurements at the same point in time, but internal differences between the two groups, however much we may attempt to adjust for them, may distort the results.

An obvious solution to the joint problems and strengths of the two methods would be to combine them. This is accomplished by making before and after measurements on participants and on a control group of nonparticipants. In this combined design the basic comparison is longitudinal (before and after on participant enterprises), but over time changes in the environment are controlled by following a control group of prematched nonparticipating enterprises and adjusting or "deflating" the before and after changes observed in the participant group by the changes which are naturally occurring in the nonparticipant group. For example, if demand for the

particular products involved was very favorable, and a production increase of 80% was observed before and after project involvement, this increase would first be reduced by the production increase which the favorable market situation caused in nonparticipant firms, say 35%, to arrive at a project associated increase of 45%

This type of combined cross-sectional and longitudinal comparison is considerably more involved than either of the others, since it involves fielding the more costly and time consuming elements of both.

5. Comparisons Based on Randomly Drawn Sample of Enterprises

To select control groups at the sampling stage (either longitudinal or cross-sectional), impact can also be estimated by a simple cross-sectional random sample of firms and the use of analytical groupings and statistical techniques. No long description of these methods will be made here because of their complexity, yet it may be useful to at least make project planners aware of the possibility.

The first of these alternatives involves constructing comparison groups based on observed characteristics of the randomly sampled participant or all enterprises in the region. For example, a random group of enterprises might be surveyed among participants. If the project intervention is technical assistance, surveyed enterprises might be placed in three groups after the survey: those receiving minimal technical assistance (say, less than 3 visits), those receiving moderate amounts of assistance (3-8 visits), and those receiving intensive attention (over 8 visits). If those with a substantial amount of the input did the same as those with almost none, it would create a presumption that the intervention had little impact. To strengthen the case, there will probably be some enterprises sampled which intended to participate but for some reason did not get assistance, and these might be used after the fact as a comparison group. If their performance was significantly poorer than that of those who received project inputs, the inference would be that the project had a significant impact. With some reflection, it can be seen that this method is attempting to do, with less precision and care, what the longitudinal and cross-sectional comparisons are designed to do.

The other method is the use of regression and correlation techniques to identify those factors which correlate highly (together or in combination) with the inference that factors which coincide are causitively related. If technical assistance and increased output happen together (have a high correlation), then we assume that they are somehow causing each other. Which causes which is less clear. For example, it may be that higher production causes increased technical assistance rather than vice versa; it may be that TA agents tend to want to visit aggressive and progressive firms. The major problem with this type of analysis is that it takes an extended period of time for the analysis, and the statistical and analytical training level of the personnel conducting the evaluation must be relatively high. It should be noted that in both longitudinal and cross-sectional comparisons the ideas are simple, and except for sampling techniques in data collection and data processing skills, no specialized analytical training is required to administer the process or make sense out of the results.

D. Analytical Methods for Evaluation Comparisons

1. Direct Comparisons of Averages

The simplest method for comparisons is to measure the average of some important evaluation concept such as increased output of the enterprise for both the before and after situation (in a longitudinal comparison) or par-

ticipant and nonparticipant groups (for a cross-sectional comparison). For example, production per hectare was compared between participant and nonparticipant groups of small farmers in the Guatemala example presented in Table 16-1

Table 16-1
Average Production of Participant and Similar Nonparticipant Small Farms
Guatemala, 1974

Farm Size	US$ of Output per Ha. of Arable Land		"t" Test of Statistical Significance
	Participants	Nonparticipants	
0-1 Ha.	$1,221	$446	"t" = 3.8
1-3 Ha.	401	384	.7
5-10 Ha.	303	296	.08

Source: S. Daines et al., The Impact of Small-Farm Credit on Income, Employment and Production (Washington, D.C.: AID, 1975), p. 24.

2. *Estimating the Reliability of the Comparisons*

a. *Control Group Reliability*

The problems inherent in both cross-sectional and longitudinal comparisons have been discussed above. To minimize these problems the methods can be combined, and the matching of control and participant enterprises can be given the utmost care. There is no acceptable way to quantitatively estimate the possible distortion from a lack of care in matching or of uncontrolled over time distortion.

b. *Survey Quality Control and Reliability*

The largest sources of error in most analytical work relate to difficulties of a practical nature in the survey. These difficulties are discussed at length in Part VII (Gathering Data for Enterprise Analysis) and relate to quality control of interviewers, coding, training, supervision and designing a satisfactory instrument (questionnaire) for obtaining enterprise level information.

c. *Statistical Reliability: Sampling Error*

The third type of reliability is called statistical reliability or the reliability of working with results from a sample and not the whole group of enterprises. The results in Table 16-1 were taken from a sample of 1,600 small farms (800 participant and 800 nonparticipant match or control farms). There were over 6,000 participant farms; the 800 surveyed represent a "sample" of the 6,000 "universe." It is possible to estimate statistically what the probability is that the comparisons based on the sample would be the same as a similar comparison based on a survey of all 6,000. This test is known as the "t" test; if the value of "t" (an algebraic computation whose method can be found in any elementary statistics text) is high it means that there is a very high probability that the sample results

are "reliable," meaning that they would not be significantly different if we had surveyed all of the participants and not just a sample.

The "t" test does not depend on the absolute size of the observed difference, but rather on its stability. For example, in Table 16-1 it would be possible to get a high "t" value and hence believability from a small difference such as that found between participants and nonparticipants in the 5-10 Ha. category. The "t" test indicates in Table 16-1 that the reliability of the findings that participants had higher output is only good for the smallest farms (0-1 Ha.) where the "t" value is 3.8. This means that we can feel confident that if all participants in this size class had been interviewed they would have shown a similar margin of superiority to nonparticipants as that shown by the sample. For the other two size groups (1-3 and 5-10), the results are very unreliable. There is no assurance that the same margin of superiority (or even any superiority at all) would have been found in the rest of the farms which were not sampled. The "t" test helps us to decide how much confidence to put in the observed differences of a sample survey-based comparison.

3. *Using Indices to Evaluate "System" Impacts*

Considerable attention was given in an earlier section of this chapter to the importance of tracking system impacts at both the family and enterprise levels. The idea was to be able to see how different parts of the enterprise or family income system contribute to the result of improvement or impact. Simple comparisons of averages such as those described above do not help this process, since all that is known when the comparison is finished is that output (or income or any other important impact) has been influenced and by how much. The intermediate mechanisms by which the project interventions caused this impact are obscured in these simple comparisons. Slightly more complex methods are required to conduct evaluations which get at these system interrelationships. The more sophisticated of these methods (production function analysis, linear programming, systems simulation) are not discussed here simply because these techniques are outside the time, resource, and skills reach of most rural enterprise project analyses. A technique which has been successfully used within these limits is the elaboration of simplified indices to capture the contribution apparently made by each of a number of simple causes.

For this technique to work there must exist a simple arithmetic and accounting framework in which any result is the simple sum of a series of component causes. This technique works well for business enterprises with increased output or profit objectives since the internal sources of increased output may be divided among the sources listed in Table 16-2. To understand how these indices might work in an evaluation of the impact of a rural enterprise project an example will be elaborated. We have a brick kiln located in a rural area. Let us assume that the project focused on providing three major inputs and had the single objective that these three interventions would increase the level of output of the participating firms. Let us further assume that the evaluation design involves a longitudinal comparison of a sample of participating firms before and after project implementation. The comparison indicated that production had increased in participating enterprises by 48% and there is no reason to suspect that anything but the project inputs caused this increase. The three project inputs added were: technical assistance to get entrepreneurs to use better technologies, credit to expand production, and in-kind disbursement of energy efficient heat source equipment for reducing the cost of fired clay products. The intent of the indices is to attempt to understand how the enterprise systems achieved the higher (48%) levels of output to illuminate how much of that

increase came from changes the project hoped to make, and to help design other projects by understanding the process of positive change.

The framework of the indices is best understood by breaking down the sources of the increased output as differences in certain accounting characteristics of the enterprise before and after project intervention. What things might be different about the firm before and after which would have given rise to the increased output? First, the entrepreneur may have increased the size of his/her productive capital base, the size of his/her business. S/he may have increased the amount of output from the same size of a capital base by either using the same capital better (technical assistance for increased managerial efficiency) or s/he may have changed the type of capital (energy efficient heat sources) which produce more output per unit input. S/he may have produced the same physical volume of output but obtained increased prices for it with the result that the value of output increased from the same capital base. This increase in prices may have been obtained by a different marketing arrangement, or improved quality product. S/he may have increased the value of output by changing the mix of the products s/he produced, such as bricks and roof tiles, without changing the quantities of either capital base, or the efficiency with which units of output are produced from the base. While these potential causes may be broken down further, the above list will serve to illustrate the use of the index technique for attributing proportional contribution among these factors. The value of each of these factors (for example, value of capital base) would be compared before and after and the index technique would associate a fixed proportion of the total increase in output with each factor as is shown in the hypothetical Table 16-2.

Table 16-2
Contribution of Firm Level Causes to Increased Output in Participant Rural Enterprises
(hypothetical figures)

Contributing Cause	Percentage of Increased Output in Participant Enterprises Associated with Each Contributing Cause
Increased value of Capital	38%
Increased Capital Yield	2%
Increased Prices for Outputs	-6%
Changed Mix of Products	14%
Total % Increase in Value of Output	48%

The hypothetical result indicated in Table 16-2 would show that the credit appears to have made the largest impact since most of the increased value of output was due to simple increase in scale, which is what one would expect from an infusion of credit. The technical assistance appears to have possibly made a substantial difference in changing the types of products produced, but additional information should be obtained from the technical assistance institution or from project documents to see if changing the mix of products was one of the major focuses of the technical advice given. Either marketing or quality must have dropped since prices obtained were actually lower. This also raises the possibility that over time controls were not accurate and prices generally in the market for these goods may have moved disfavorably for participant and nonparticipants alike. Technical assistance aimed at making the enterprises more efficient by increasing the yield from existing capital or changing the types of capital (heat source equipment) seems not to have worked well, since only 2% out of the 48% increase seems to have come from

this source. The index technique helps to sort out causation and to associate impact with specific components of a project having multiple interventions. It should be noted that the index technique does not attribute cause with any high degree of precision, but it does help to raise or support hypotheses about the causes of project impacts.

An actual evaluation example using real field data is shown in Table 16-3. Table 16-3 was based on the same small farm evaluation case used in Table 16-1 above, and uses indices to divide the increased output associated with project intervention among a series of contributing causes. The enterprises in this case are small farms, not agroindustries or other small scale rural enterprises, and hence the categories are not the same as those outlined for a rural enterprise application of the same index technique. The differences in total farm output in Table 16-3 are distinct from the differences in output per hectare used in Table 16-1.

Table 16-3
Sources of Increased Production in Participating Small Farms
Guatemala, 1974

Farm Size Class	Superiority in Total Output per Farm	Sources of Difference in Output				
		Difference in Land Use		Difference in Crop Composition (Higher Value Crops)	Different Technologies	
		Increase in Farm Area	Intensification of Land Use		Increased Yields	Increased Prices (Marketing & Quality Differences
0-1 Hectares	147%	6%	-8%	154%	-4%	-1%
1-3 Hectares	37	9	10	15	1	2
3-5 Hectares	20	1	15	-8	15	-3
5-10 Hectares	12	3	14	-1	2	-6
10+ Hectares	17	7	18	-1	0	-7
All Farms	32	17	18	0	-3	0

Source: S. Daines et al., **The Impact of Small Farm Credit on Income, Employment and Food Production** (Washington, D.C.: AID, 1975), p. 3.

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