PN-AAE-162

# Information for Decisionmaking in Rural Development

## volume one

A Report Prepared for the
Office of Rural Development,
Agency for International Development
Under Contract AID/otr-C-1383
Work Order No. 20

MAY 22, 1978

# INFORMATION FOR DECISIONMAKING IN RURAL DEVELOPMENT

## VOLUME ONE

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May 22, 1978

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# PREFACE

The draft of *Information for Decisionmaking in Rural Development* was completed in April 1977. The 300-page document was submitted to numerous reviewers for comment and recommendations, while DAI staff also conducted an assessment of the work. The net verdict was that the study undertook too large a task and, in attempting to cover an exceedingly complex subject, presented a report that contained much of value but was nearly unreadable in presentation and organization. One particular problem was the mix of intended audiences, ranging from project manager to regional planner to technical information system specialist.

After six months the Rural Development Office of the Agency for International Development decided to fund a revision and improvement of the study, which was to present more simply the essentials of information for decisionmakers in one section, and the details of information systems for technicians in another. This has led to the present two-volume study.

In revising the report, DAI drew upon the comments that had been offered on the draft, as well as a good deal of original material that had been generated specifically for the final report. Individual case studies were reviewed, and projects revisited in Thailand, Indonesia, and the Philippines in Asia; Kenya and Tanzania in Africa; and Colombia in Latin America. In addition DAI sent staff (at its own expense) to a useful workshop on Information Systems for Rural Development Projects, sponsored by the OECD during March 1978, where an exchange of experiences and case studies among nearly 50 practitioners provided an excellent overview of the state of the art. Many of the ideas generated at the seminar are presented in this report.

Much new material represents continued work by DAI under contract to design and operate information systems in development projects around the world. This is true of the internal project monitoring and evaluation system in the Hanang District Rural Health Project and the study of the impact of labor-intensive feeder roads in Colombia. Other material results from the completion of subsequent major reports to AID on the design and implementation of development projects; the findings of these reports are referred to, rather than repeated in yet another document.

The subject of information is inextricably bound to that of appropriate project design and the implementation of rural development projects. No amount of analytical objectivity will overcome the fact that DAI has adopted an approach to development

that involves participation by and benefits to a local population in a self-sustaining process of socioeconomic growth. Research has shown that participation in the information flow and in project decisionmaking is likely to be crucial for project success. Thus the choise of development philosophy is the significant parameter in the definition of critical policy decisions within rural development, and in the specification of information requirements.

The bulk of the fieldwork and writing of this report has fallen to Donald Mickelwait and Alan Roth, with major inputs from George Poynor of Poynor International. Inc. Dr. Poynor is responsible for Chapter Two in Volume One, as well as the chapters on Sector Analysis and Area Frame Sampling in Volume Two. ATAC's Bill Rusch supplied a detailed account of the technique of computerized farm surveys, which is referred to in the body of the report. For DAI, Peter Weisel completed the assessment of two information projects in Kenya and the Hanang study in Tanzania. Richard Smith described the ongoing Colombian road impact study. Elliott Morss reviewed all material and provided the chapter on information use in Volume One. In all, many of the professional staff assisted in clarifying concepts and presentation. We believe these two volumes add to a growing body of knowledge on alternatives for the use of information to support rural development projects.

Donald R. Mickelwait
Washington, D.C.
May 22, 1978

## RELATED STUDIES BY DEVELOPMENT ALTERNATIVES, INC.

The following research reports all deal with the process of project development, design and implementation when the objective is to reach, benefit and involve the rural poor. The titles of the studies and their shortened references for use in this report are as follows:

*Strategies for Small Farmer Development: An Empirical Study of Rural Development Projects in The Gambia, Ghana, Kenya, Lesotho, Nigeria, Bolivia, Colombia, Mexico, Paraguay and Peru* (two volumes), by Elliott R. Morss, John K. Hatch, Donald R. Mickelwait, and Charles F. Sweet, a report prepared for the Office of Development Administration of the Technical Assistance Bureau in the Agency for International Development. Boulder, Colo.: Westview Press, 1976. Referred to in this work as the *Strategies* report.

*Personnel Requirements for Project Development in East and Southern Africa*, by Donald R. Mickelwait, Donald R. Jackson, Craig V. Olson, Alan Roth, Charles F. Sweet, and Peter F. Weisel, a report prepared for the East Africa Regional Economic Development Services Office of the Agency for International Development, October 1977. Referred to in this work as the *Personnel Requirements* report.

*The "New Directions" Mandate: Studies in Project Design, Approval and Implementation* (two volumes), by Donald R. Mickelwait, Charles F. Sweet, Elliott R. Morss, A. H. Barclay, Jr., Craig V. Olson, Victoria A. Sorsby, and Peter F. Weisel, a report prepared for the Technical Assistance Bureau in the Office of Rural Development of the Agency for International Development, January 1978. Referred to in this work as the *"New Directions" Mandate* report.

# CHAPTER ONE

# FRAMEWORK FOR THE STUDY

## BACKGROUND

For years major international donors distributed resources on the assumption that intermediate ends -- most often in the form of physical infrastructure -- were the key to long-term development in the rural areas of the Third World. By investing in infrastructure and undertaking large capital transfers, donor agencies expected to accelerate the development process, directly or indirectly, among all members of the rural population. As a result, the portfolios of the World Bank, the Agency for International Development (AID) and other agencies concentrated on such activities as national highway construction, support to agricultural research stations, dams and electrification projects, and direct assistance to universities in developing countries.

In the 1970s, the agencies came to realize what academics and other field personnel who had been studying the dynamics of local communities already knew: the capital flow to achieve intermediate ends was tending to widen income differentials rather than narrow them. In a major change of priorities, the World Bank and AID announced that their development programs

should focus directly on benefiting the poor in Third World nations, particularly in the rural areas.

In the past, monitoring and evaluation of major development projects was usually confined to observing that the intermediate ends of capital investment were being accomplished: the number of bridges, roads and dams built, of Ph.D.s trained and universities established, could all be counted. Now, in recognition that the hoped-for linkages between intermediate ends and ultimate objectives do not necessarily hold, and as a result of the new directions of donor agencies, monitoring and evaluation systems must be designed to measure final impact, with particular attention given to ensuring that benefits reach the poorest in the rural area. Such a requirement has placed great strain and stress on underdeveloped data collection and analysis systems, because there simply is no accepted, cost-effective means readily available to achieve this.

None of the major donors has made a rigorous assessment of the benefits and costs of alternative approaches to data collection and analysis. Monitoring and evaluation activities are frequently carried out within specific projects, but the results have been mixed: the methods adopted have included both high- and low-precision measurement of impact variables, and the costs of project information systems have varied enormously. In the present context, project managers do not have a firm basis for choosing among alternative approaches in order

to obtain the information they need. A similar dilemma confronts policymakers at the sector, regional and national levels. They must select an approach that will deliver relevant information -- at an acceptable level of accuracy -- in a timely and cost-effective fashion, and packaged so as to be useful for decisionmaking. Yet the criteria on which this selection should be based have never been systematically defined.

This report attempts to come to grips with this problem: first, by providing a comprehensive review of the state of the art in information system development, and second, by identifying a process through which the problem can be resolved. The report has been prepared to assist decisionmakers who want to use empirical information as a basis for delivering development assistance to the rural poor.

## LEVELS OF DECISIONMAKING

Resolution of the information problem calls at the outset for a specification of information needs at each stage of development assistance. A logical sequence can be identified with discrete information needs and uses for each of the following sets of decisions:

- Specify the development problem;
- Specify a reasonable set of development objectives;

- Identify possible programmatic options to realize the objectives;
- Select the appropriate programmatic options to be employed;
- Design projects in accordance with selected programmatic options;
- Implement, monitor and evaluate the projects so designed; and
- Improve upon program options and project designs progressively through time.

In this sequence, the quality and timeliness of information available at each stage affect not only the immediate decisionmaking task, but also the prospects for informed decisionmaking at subsequent stages.

For the purposes of this report, a two-tiered decisionmaking structure for rural development is assumed, with one tier encompassing the national, regional and sectoral levels (referred to here as the "program" level), and the second tier representing the project level. Of the seven stages listed above, the first four are normally addressed at the program level, and the fifth and sixth at the project level; the seventh involves feedback of experience gained at the project level into program-level policymaking.

This conceptual distinction is reflected in the real world division of labor between decisionmakers. At the national/regional/sectoral level, decisions must be taken with regard to overall development objectives, geographic areas of major con-

cern and programmatic priorities. One function of these decisions is to provide detailed guidelines for project development. A related function is to establish the broad parameters of policy within which project designs are to take shape: these include input and output prices, taxes, subsidies, land tenure regulations and other economic arrangements. As the results of project evaluations become available, program-level decisionmakers are responsible for using those results to modify objectives, policy parameters and project guidelines. Program-level decisionmaking and related information problems are discussed in Chapter Two of this volume.

It is at the project level, on the other hand, that primary responsibility rests for designing, implementing, monitoring and evaluating projects in a manner that is consistent with the guidelines and policies emanating from the program level. Project-level decisionmaking and related information problems are addressed in Chapter Three.

Although the program/project distinction is convenient for analytical treatment in this report, it does not imply that decisionmakers at either level operate in a vacuum. They are logically interdependent, in the sense that consistency in the quality of project design and implementation hinges on the caliber of policymaking; conversely, policy guidelines need to be continuously measured against concrete experience, and modified accordingly. It is a central thesis of this report that improved

performance in development assistance depends on a timely flow of information between all levels in the hierarchy of decision-makers.

## CHOOSING AN INFORMATION STRATEGY

Having specified the levels at which information is needed, it is next necessary to identify the appropriate information collection, analysis and use strategies. The procedure for accomplishing this task is described by the following steps:

Step 1: Determine differential benefits or resource use under alternative policy options. In most cases there are anticipated differences in resources to be committed and development impact expected, so that more information, which improves the policy choice, would pay high dividends.

Step 2: Determine how much money, management time and attention, elapsed time prior to policy decisionmaking, and delay can be tolerated in seeking additional information. These will be important constraints on the utilization of the various data collection and analysis approaches.

Step 3: Determine what constitutes relevant data necessary to support policy choice. Determine the precision of measurement and accuracy levels necessary in acquiring additional information.

Step 4: Determine the most appropriate and cost-effective data collection methodology and data analysis techniques. This calls for a listing of the various data collection and analysis options, with factors of timeliness, validity, precision, accuracy, costs and benefits well specified and defined for each approach.

Step 5: Utilize the selected strategy to gather and analyze data, which can be processed into the information specifically required by decisionmakers.

Step 6: Incorporate the information generated in Step 5 into policy decisionmaking. Here attention should be focused on information packaging and dissemination to ensure maximum use.

This sequence makes clear there are two kinds of decisions required in order to resolve the information problem. First, there needs to be a clear specification of policy options. This is necessary to determine whether there is a need for further information. Second, there is the selection of the most appropriate and cost-effective information strategy for the particular problem at hand. Since this choice is constrained by time and money, data collection and analysis will cease when:

- The likelihood of making the best decision is raised to an acceptable level of certainty;
- The marginal cost of obtaining (or waiting for) additional information exceeds the marginal benefit to be derived from the increased certainty that the policy with the highest development benefits is selected; or
- Personnel, equipment and budgetary resources are no longer available.

In either event, data collection and analysis stop long before all the unknowns can be resolved. The level of certainty in making policy decisions in rural development projects is the critical variable to be affected by an increase in the quantity and quality of information.

The major assessments presented in this report concern the costs and benefits, timeliness, accuracy, precision, and usefulness of information generated by alternative methodologies, for

decisionmakers in the field of rural development.

## FOCUSING THE REPORT

In a well conceived model of development planning, designed to operate over time, national (regional/sectoral) decisionmaking sets the guidelines for project development, establishes important policy parameters on project operations, and conducts post-project evaluations that feed back into the macro-level determination of priorities, objectives and appropriate paths to development. If the time span is 40 years, this may allow five to ten project cycles, with improvements both in project design and operations and in national-level policy decisionmaking on the basis of empirical data generated from the development projects.

However, at any one point in time, the project designer or project manager must acknowledge that existing policies are a constraint on his freedom of action. Such policies constitute parameters within which the project must operate, although project results may potentially be used to affect changes in higher-level policy decisions. For this reason, the main thrust of this report concerns the information problems faced by rural development project designers and project managers. It is at the project level that the most instructive lessons can be drawn, from work already accomplished or currently underway, concerning

design and use of information systems for rural development.

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# CHAPTER TWO

# NATIONAL-LEVEL INFORMATION NEEDS

## INTRODUCTION

The first chapter outlined information requirements for rural development decisionmaking at the program (national/regional/sectoral) level. In this chapter these requiremens will be elaborated and their implications in determining appropriate information strategies discussed.

National, regional and sectoral policy decisions all play important roles vis-à-vis the project development process. However, this discussion focuses on the national level, which embodies the principal decision characteristics found at the regional and sectoral levels. For analytical purposes it is useful to distinguish between two types of national responsibilities that affect rural development. First, the national government needs information to permit macro-economic policy determinations; second, the national government needs information to establish project guidelines for rural development projects.

# MACRO-ECONOMIC POLICY

## Information Needs

Macro-economic policies and instruments can have important direct and indirect effects on rural development. These instruments include monetary and fiscal policies and other government intervention into free market mechanisms, such as price controls, subsidies, special taxes, import quotas, currency exchange restrictions and land tenure regulations. Monetary and fiscal policies impact upon overall economic activity and thereby upon aggregate demand, unemployment and the rate of inflation. Price controls, subsidies, special taxes and import quotas can directly affect production costs and market prices in rural areas.

Most Third World countries have developed, sometimes with the assistance of the International Monetary Fund and/or the World Bank, a set of national accounts that serve as the basis for macro-economic analysis and policy. Yet data collected for use in national accounts often cannot be disaggregated for use in setting project guidelines, or for other subnational planning requirements.[1] Attempts to improve national planning have led to the generation of macro-economic models with regional or functional focuses, which attempt to predict the effects of alternative policy decisions. As national accounts become more com-

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[1] This is because of the difference in the cost of data collection on a national basis (the most aggregate sampling) and collection at regional, state, sector or project levels. Each additional functional "cut" increases the size of the sample and the cost of the collection effort.

plex, and as the economic models demand increasingly accurate data on many discrete activities, information requirements multiply. Chapter Two of Volume Two, which is devoted to Sector Analysis models in agriculture, describes in some detail the information requirements that have been generated in countries that have taken this route to macro-economic development planning (pp. 21-24).

## Data Collection Experience

Most governments undertake large-scale data collection operations to supplement data available from administrative records. Censuses and surveys are commonly employed for this purpose. For example, although administrative records provide data on the number of pupils enrolled in schools, censuses and surveys can supply important information on the percent of pupils enrolled, school attendance (perhaps even teacher attendance), literacy rates, employment related to educational achievement, etc. A persistent problem in developing countries, however, is that census and survey results are usually outdated by the time they appear. In the absence of computer capacity and trained statisticians, long delays occur in data processing and the reporting of results: an interval of three or four years is not uncommon.[1] Many developing countries are in the process of developing or expanding computerized information systems that may help them

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[1] See Volume Two, Chapter Five, for a discussion of data processing problems associated with large-scale surveys; the Case Study on the National Sample Survey of India is particularly instructive (pp. 131-133).

decrease the time between data collection and the reporting of findings. However, for the current period and for the near future censuses and large-scale surveys can be expected to take several years to process.

The problem with macro-level survey data in developing countries is not simply one of time, but also the quality of the data that are gathered. The United Nations Research Institute for Social Development (UNRISD) recently convened a group of experts on statistical surveys, who identified several factors contributing to poor quality of survey data:

> There are well known reasons for poor quality: incomplete coverage; inadequate sampling; failure of people to register events or to recall and report them correctly; suspicion of government or other outside authority on the part of interviewees and evasive or misleading replies; falsification of records and reports; poor formulation of questionnaires; bad guessing when data are missing; carelessness and poor training of interviewers and record-keepers; processing errors. Incorrect or misleading statistics may be issued for political reasons to avoid unpleasant pictures of reality; correct statistics may be suppressed.[1]

Since the recent reorientation of the development approach to the poorer, more disadvantaged sectors of the population, the data that are typically available are not sufficient for current planning activities. The UNRISD experts reported:

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[1] United Nations Research Institute for Social Development, "Report of a Group of Experts," Geneva, 1976, p. 7.

> Most development plans today announce policies which aim at reducing poverty, improving distribution, cutting down unemployment and underemployment, improving rural health services, reducing regional disparities and reforming land-tenure systems. It is discouraging to note that in general the related data are among the poorest in the whole field of development statistics.[1]

There are several problems related to the improvement of the capacity of developing countries to collect and analyze data for macro-level development planning. The first problem is the gap between data collectors and processors on the one hand, and data users on the other. Statisticians often have a different orientation and different interests than planners. The recent reorientation in planning has apparently not permeated the ranks of the statisticians who have established data sets and routine operations. Statistical operations in developing countries have been receiving considerable support from bilateral and international donors. This assistance is usually related to specific censuses or surveys, and is oriented to the technical elements rather than user needs. According to the UNRISD expert group: "The influence in effect of international organizations is generally towards expanding and extending universal series, rather than building up statistical systems specifically adapted to local development needs."[2]

The discussion of sector-level analysis in Volume Two centers on how agricultural and related data are processed for use by

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[1] Ibid.

[2] Ibid.

policymakers in macro-level planning and selection of development projects. The information source problem is acknowledged as a major constraint, but does not diminish the need to maximize the capacity to analyze data (and collect data to fill information gaps) for national, regional or sector planning.

## PROJECT GUIDELINES

In addition to needing information for macro-level policymaking, national governments also need information to develop programs/guidelines for rural development activities. Ideally the guidelines should be based on a thorough knowledge of the state of the art in rural development efforts throughout the world. In concrete terms, this would entail a thorough understanding of what has worked, what has not, and why, in each particular context. In reality, of course, the inventory of such knowledge is far from complete. An accurate picture of the effects of past and ongoing rural development efforts can only come from data collectors' efforts at the project level. This requires close collaboration between program staff working at the national level and those working on monitoring and evaluation at the project level. Such collaboration should make it possible to effect certain economies of scale in data collection and analysis. Unfortunately, such collaboration is rarely seen. Project-level personnel frequently view information demands from the national level as a threat to their own autonomy, and/or as

an unnecessary waste of time and resources. By the same token, national-level personnel often develop their own information needs in a conceptual vacuum and insist upon totally new and independent data collection efforts.

Since adequate goals and objectives relating to rural populations cannot be formulated without a certain amount of basic information about these populations, one of the highest priorities at the project level should be the provision of this type of information. Because of the general character of information required, and the multiple planning objectives that must be addressed, profiles of rural populations need to be drawn from a number of different points of view. At the outset, such information is probably best obtained by using rapid reconnaissance methods,[1] but eventually methods that permit more precise statements must be used as well. In later portions of this report, several survey approaches are described that are used for obtaining this kind of information.

Another information priority concerns the provision of data against which project performance can be measured. In most instances this "baseline" data can probably best be obtained by making the collection effort an element of the project itself. A number of AID projects currently underway have components with a specific purpose to produce data against which the project

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[1] See Volume Two, Chapter Six for a discussion of this approach to data collection and analysis (pp. 151-179).

accomplishments can later be measured. Several of the case studies in Volume Two describe recent experience with internal project systems of this kind (especially Chapter Eight).

## SUMMARY

Adoption of broader development goals, which focus on the delivery of direct benefits to the poorest members of the population, has had a profound impact on information needs. Since indirect indicators of progress have been shown to be of limited value in decisions regarding this expanded set of goals, new and direct indicators of progress must be developed and fleshed out with the information required to put them into use. The onus for providing most of the information for this altered decision process now lies at the project level; specifically with those people who plan, develop and implement rural development projects. This creates new demands on responsible positions, and some development practitioners have reacted negatively to participation in the process. But it also presents to the rural development community a special opportunity to make a lasting impact on national planning by helping to analyze goals, define objectives, set priorities, and measure the progress of national development efforts. While the conceptual basis for measuring impact is weak in many areas, enough is known to begin to develop information profiles concerning rural populations, for use in the decision process.

Later chapters in this volume and its companion will address specific information concerns, and specific methods for obtaining the information needed.

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# CHAPTER THREE

# PROJECT-LEVEL INFORMATION NEEDS

## INTRODUCTION

Once guidelines have been established, information is needed for project design, project approval and project implementation. This chapter will detail the information requirements under each of these headings.

Three basic issues may be identified at the outset. First, there is a distinction between information needed for project design and information needed for project approval. In practice, much of the information needed for project design should be a necessary although not sufficient condition for project approval. It should be possible to organize the information needed for project design in a manner to predict whether the project is likely to succeed or fail. This information can then play a critical role in the review and approval process. In this sense the information needs for design and approval may overlap to a significant degree.

Second, the amount of information needed for design and approval should depend on the nature of the project. In projects designed to start with few resources and develop activities through the participation of the rural poor in decisionmaking,

information needs for design and approval are likely to be modest. In contrast, information needs will be substantial if the project is intended to entail an immediate high level of activity and resource outlay, and comprise several discrete components.

Third, flow of information in the design, approval and implementation of rural development projects is of critical importance. Earlier work has documented the importance of the "bottom-up" flow of information during project design and the importance of host country organizational involvement during both design and implementation.[1] Channeling and sustaining this flow is crucial to informed and timely decisionmaking at each stage of project development.

## INFORMATION NEEDS FOR PROJECT DESIGN

### Preventing Data Overkill

A project design should spell out a plan of action for development activities that make sense in the political, economic,

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[1] The significance of local-level participation in decisionmaking about project activities was a principal finding of a DAI study of 36 rural development projects in Latin America and Africa [Elliott R. Morss, John K. Hatch, Donald R. Mickelwait, and Charles F. Sweet, *Strategies for Small Farmer Development: An Empirical Study of Rural Development Projects* (two volumes), Boulder, Colo.: Westview Press, 1976, referred to as the *Strategies* report]. A fuller analytical treatment of information flows and host country involvement in design and implementation is presented in Chapters Six and Eight of Donald R. Mickelwait, Charles F. Sweet, Elliott R. Morss, A. H. Barclay, Jr., Craig V. Olson, Victoria A. Sorsby, and Peter F. Weisel, *The "New Directions" Mandate: Studies in Project Design, Approval and Implementation* (two volumes), a report prepared for the Technical Assistance Bureau in the Office of Rural Development, AID, January 1978, by Development Alternatives, Inc., referred to as the *"New Directions" Mandate* report.

social and cultural milieu where the project must operate. The plan of action can range from little more than locating a single technical advisor in an area, to creating a large integrated rural development project with several discrete components; information needs for this latter type of project dwarf those of the former.

For project design work, information is needed both to specify a plan of action and to identify the factors likely to impinge on that plan. In completing the actual design, it is critical to determine what is relevant and when. In a short period of time an experienced rural development specialist can accumulate a large body of data that will be invaluable during project implementation. Of this, however, perhaps only a small proportion will be immediately appropriate for inclusion in the design. Too often project designers succumb to writing lengthy narratives, based on a handbook of "laundry list" of generalized data requirements. From several standpoints, this approach is a costly one:

- Time and resources are expended in collecting, processing and packaging data for inclusion in a lengthy project design paper;
- In attempting to cover "everything," the designer may give insufficient attention or emphasis to the critical elements; and
- In attempting to read "everything," the reviewer may fail to grasp the critical elements of the project.

It is obvious, in any case, that an informed designer will always know more about both the project environment and the strategy of development assistance than can be expressed in the pages of a Project Paper. An abundance of data produces an overkill effect

when used indiscriminately in the design; on the other hand it can be extremely valuable once project implementation is underway.

These considerations suggest that information gathered during the design phase is most likely to be put to optimal use when the same actors are involved in both design and implementation. This makes it possible to prepare a concise and tightly argued design, and at the same time to establish a store of more detailed information that can be drawn on during the implementation phase. If this strategy can be adopted,[1] then a general prescription in preparing a project design might be to limit the presentation of information to:

- What is required for a sound implementation plan; and
- Factors that have a reasonable probability of impinging on that plan and affecting its outcome.

## Information Requirements

The information requirements for rural development project design can be grouped under the following general classifications:

- Technical specifications for the use of resources in one or more local socioeconomic environments to assist an identified target population;[2] and

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[1] It may be noted that continuity of involvement from design to implementation has been the exception rather than the rule in AID-supported rural development projects.

[2] The rural development projects under consideration in this report have an area focus (not necessarily one contiguous area), involve increasing small farmer income, agricultural production/productivity and may include education, health, nutrition, and social services.

- Organizational specifications for a management structure through which external and domestic resources can be directed to the target population.

Technical Specification data categories for project design include:

- Information that allows an understanding of the project environment: the human, social, economic, cultural, political, physical linkages that combine to produce the existing political and economic relations. Sooner or later it will be important to understand the dynamics of the local environment in order to anticipate the effect upon the target group of the intervention of outside development resources. Static information on agricultural cropping systems, marketing, storage, levels of health, nutrition and education is often useful at the outset for project planning purposes.

- Information that allows the determination of an appropriate development strategy. This requires the identification of a target group, a set of technological improvements that might improve the well-being of that group, and the tracing of the technology through from adaptive testing (to customize it for the local area), to the self-sustaining benefits that will accrue to the target group over time as a result of development assistance. If new technologies are to be introduced in agriculture, then testing, extension, training, credit, technology use, harvesting, storage, transportation, and marketing must be viewed as a system, with each step reviewed for constraints to completion.

- Information that will fit the project strategy and components to regional/sectoral/national objectives. These parameters and constraints must usually be accepted in the short term, although the experience gained in project design -- and especially during implementation -- may be a factor in modifying policy objectives.

- Information that will establish objectives for each target group (e.g., farmers, landless laborers, women, small children) to be affected by the project. The objectives should include a clear specification of the behavior changes for each group that are anticipated or viewed as necessary for the project to reach its objectives. This serves as the basis for the "early warning system" to identify problems that inevitably arise during project implementation.

Organizational Specifications for rural development project design include:

- Information to determine the appropriate project structure and how it should relate to existing organizations within the host country's government. Here, as in the investigation of the local project environment, it is necessary to know the existing structure and administrative/management capacity, the staffing and support patterns and the lines of authority and cooperation that have evolved in the project area. The "optimization" of the project management structure is a complex synthesis of what exists and what might work. This issue tends to get short shrift in most project designs, producing unfortunate results when actual implementation begins.[1]

- Information to define workable management arrangements for the project. This is a problem of creating appropriate incentives and mechanisms to ensure that "cooperating" agencies and departments actually fulfill on their commitments of staff, operating funds, resources, transportation, specialists, etc. This is necessary since rural development almost inevitably spans a number of functional areas and line ministry responsibilities. While it is relatively easy to agree on language concerning "coordination of activities" in the Project Paper, it has proven far more difficult to obtain the promised cooperation

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[1] See *"New Directions" Mandate*, Chapter Eight, "Reflections on Project Organization and Implementation."

once the project is under way. The details of the resources to be committed, including the budget requests necessary to support an increased level of activity, are a vital part of the project design process and require meaningful involvement of host country officials.

- Activities of information search and analysis that establish a commitment to implement the project as designed. One difficult responsibility of project design is that of obtaining a commitment from the host country government, at the policy as well as the working level, to make the project work as planned. Since the government may be less concerned with benefiting a particular target group than the donor, a commitment must be obtained to ensure that the benefits of development reach the intended population. The most tested method for obtaining this commitment is through participatory involvement of host country officials at working levels in field research, hypothesis testing, project component design, and presentation of findings and design components to top decisionmakers.

## INFORMATION NEEDS FOR PROJECT APPROVAL

Beyond the natural overlap of information needs for project design and project approval in the presentation of a sound implementation plan, potential donors can legitimately request specific information -- not integral to the design itself -- to help determine whether a proposed project satisfies their funding criteria. This information may be needed to justify the approach and activities proposed in the design. The information burden may be further increased if a prospective donor has several com-

peting projects, all satisfying the basic funding criteria, and must choose among them due to limited resources.

AID and other donor agencies have handbooks of regulations that must be met prior to project approval. These provide project designers and packagers -- the two are not always the same -- with voluminous guidance regarding information needs and the mode of presentation. But experience has shown that adherence to these instructions does not guarantee smooth passage through the review and approval process. In practice a considerable number of judgmental decisions are taken by various actors within the approval process. Definitive criteria cannot be spelled out for each and every issue that may arise. As a result, decisions (to approve, delay, redesign, etc.) are made with varying degrees of discretionary latitude.

In these circumstances, the range of information needs for project approval has grown, often to a point where advocacy and justification consume far more time and resources than the conceptual inputs into the design itself. Evidence from a review of AID-supported rural development projects suggests that information burdens are disproportionately heavy in the approval phase, as compared with design and implementation.[1]

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[1] Further discussion of these issues and empirical review can be found in Chapter Five of Donald R. Mickelwait, Donald R. Jackson, Craig V. Olson, Alan Roth, Charles F. Sweet, and Peter F. Weisel, *Personnel Requirements for Project Development in East and Southern Africa*, a Report prepared for the Regional Economic Development Services Office (REDSO) for East and Southern Africa, October 17, 1977, by Development Alternatives, Inc., referred to as the *Personnel Requirements* report. Chapters Three and Eight of the *"New Directions" Mandate* report are also recommended.

## INFORMATION NEEDS FOR PROJECT IMPLEMENTATION

There are several philosophies that can serve as a rationale for information needs during implementation. One approach frequently used in the past was to assume that all the critical project issues could be resolved during the project design phase. During project implementation, the only requirement was to monitor project activities to ensure they were attaining pre-specified goals on schedule. A post-project evaluation would then be performed to determine whether the project had achieved its objectives. Using this approach, information needs during project implementation are minimal.

Growing disillusionment with the assumptions underlying the first approach, namely that an implementable plan of action can be fully delineated during the design stage, has led to a second, more modest approach. This assumes that a plausible plan of action can be developed during the design phase, but that the initial part of the implementation phase should be viewed as a testing period for that plan. This creates greater information needs, since some testing of the planned approach will be required.

The third approach starts from the assumption that the proper project strategy cannot be known prior to the actual implementation efforts and that to maximize chances for success, the target population should be involved in ongoing project decisions. The implications of this approach are that the project designs

should be flexible enough to permit the project to evolve in different directions. In this instance, information needs during implementation are heavier still. Not only is there a need for experimentation, but also there is a need for a systematic two-way information flow between project management and project participants.[1]

## Information for Monitoring Project Activities and Assumptions

Monitoring information provides a flow of data into various levels of project management, which allows the tracking of resources used, staff employed and the intermediate results (outputs) of the project; these can then be matched against the planning schedule established during project design. The standard AID system involves a combination of networking, PERT, and accounting requirements. Unfortunately such systems tell little about the actual effects or impact of the project under the circumstances of implementation. Measuring output achievement against planned targets may reveal more about the optimism of the designers than about the competence of the project implementors.

Monitoring is also important for the review of critical aspects of the project that are outside the control of management. This includes policy determinations on prices, subsidies, credit and interest rates that were incorporated into project design,

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[1] "Experimentation" is used in its non-laboratory context, and is in this instance equated to "adaptive field-testing." See *"New Directions" Mandate*, Chapter Seven, for a detailed discussion of the use of this technique in rural development projects.

and the resources and support that were to be provided by "cooperating" agencies or departments. Such agreements are readily made in principle, but are often difficult to implement in practice, and the absence of promised support will delay full implementation.[1] Other factors outside project management control, such as migration patterns, market fluctuations and climatic changes, should also be monitored to determine whether and how they affect project performance.

Monitoring is also very important to provide early warning data on the receptivity of the target population to the project. In some cases monitoring will involve merely the observation of behavior changes that were detailed during the design phase as critical to project success. In agriculture the adoption of a new production technology is evident long before harvest. In health and nutrition, similar observable behavior indicates acceptance or rejection of newly recommended practices. In other cases the perceptions of the target population can be obtained by informal discussions, group meetings, and other opportunities for two-way communications. This report argues that such information exchange increases benefits in effecting behavior change and in promoting the receptivity necessary for project success.

The design of a project monitoring system must take into account the relative costs and benefits of regular reporting as

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[1] Some of the promised outside-the-project resources may seem trivial during planning, such as the provision of housing for the technical assistance team and project management. Experience suggests that such pieces of the implementation puzzle are critical and must be identified and pushed with vigor to prevent long delays in project operations.

opposed to occasional special investigations. Information collected on a regular basis should permit an early warning of upcoming problems. However it is extremely costly to design a monitoring system that will also provide resolutions of problems for an ongoing project. It is usually more cost-effective for project managers to call in a troubleshooting team as problems are identified.

For recurrent monitoring information needs, the alternatives are to employ a formalized structural reporting network or to use an informal network of key informants. The costs and benefits of each option should be carefully weighed. Section III of this volume addresses this decision problem in some detail.

Information for Evaluating Project Success

Evaluation calls for taking stock of the results of a project over a defined time period and making judgments on efficiency, efficacy and thus project success against a variety of standards. One standard of success is to measure project attainment against project objectives as stated in the design document. This has not proven to be a particularly useful methodology, since the objectives as stated are often gross estimates of the end-of-project status. A second and increasingly popular evaluation methodology is to establish an information baseline, measure the same data points after project initiation, subtract the expected differences between "before" and "after," and find a means to determine how much of the change is attributable to the project.

A baseline survey measurement system must be carefully thought out and relatively modest in execution if it is to be useful.[1]

Although most evaluation systems currently in use are limited to impact assessment (and stop when a measurement of change has been obtained), it is possible to extend the evaluation system to provide management with an assessment of how much of the change can be attributed to the project. This would include a general explanation of why the changes took place or failed to, or why there was variance in change or the rate of change in different areas or among different members of the target group, and recommendations to help management overcome identified constraints, modify priorities and implementation procedures and improve the impact of the project. This information is far more useful, and less threatening, to management than a "grading" of the impact or overall success of the project in the absence of explanatory factors and recommendations for improvements.

## The Relationship Between Monitoring and Ongoing Evaluation

Monitoring is a control function that includes matching project performance against intended output targets. Evaluation is an examination of the impact of the project and the fulfillment of ultimate objectives and an identification of the reasons

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[1] For example, no examples were found of statistically sound baseline measurement of farm income in the "before" stage, remeasurement in the "after" stage, and justifiable attribution to the intervention of the project. The income variable is too complex, and errors too prevalent, to use standard farm household survey techniques. There are alternatives, which are discussed in later chapters of this report.

for unusually high or low performance. In practice the two often mesh into one long information continuum, beginning with data on technical processes within the project and ending with judgments on the impact of the project on the target population.

It makes sense to take advantage of these overlaps wherever possible, by developing a capacity at the project level to collect information that serves both purposes. This does not mean that exclusive responsibility for evaluation should rest with management at the project level. Participation by donor personnel and/or outside consultants in mid-project or end-of-project evaluations enhances objectivity and usually provides fresh insights into project performance and its underlying causes. However, the quality of the assessments that are made depends to a great extent on the information base that evaluators have to work with: when the only basis for evaluation is ad hoc data collection, the entire exercise is likely to be superficial. On the other hand, when information has been assembled for diagnostic purposes during the implementation phase, the evaluation team will be able to explore the more complex issues in some depth, by following up on findings generated by the project's own system. For this reason there has been growing interest in internal project systems that satisfy needs for both monitoring <u>and</u> evaluation. The major problems affecting the development of such systems are analyzed in Chapter Five of this volume, and extensive case study material is presented in Volume Two.

# CHAPTER FOUR

# DATA COLLECTION TECHNIQUES

## INTRODUCTION

Once a decisionmaker has identified a need for certain categories of information, he is faced with the problem of choosing among different methods of obtaining it. There is a broad range of data collection and analysis techniques potentially available to him, but they are not equally suited to each situation in which decisions must be made. The question of choice necessarily creates significant tradeoffs, which are not always adequately understood when attempts are made to satisfy information needs.

This chapter provides an overview of the range of techniques at the disposal of the decisionmaker, and comments on several technical issues associated with efforts to apply the techniques. The tendency of decisionmakers (particularly at the project level) to defer to information specialists with regard to technical and statistical details should not obscure the fact that decisionmakers themselves have the best understanding of what information is actually needed. It will be emphasized that standardized, sophisticated "solutions" applicable to each and every rural development context simply do not exist. The choice of any methodology inevitably has its pros and cons, and there is reason to believe that the term "information system" itself needs to be

demystified if rural development practitioners are to make sensible and considered judgments about how to satisfy their own critical information needs.

## APPROACHES TO DATA COLLECTION AND ANALYSIS

The data collection and analysis techniques described in Volume Two of this report can be classified and grouped in a variety of ways. One way of viewing them is in relation to the degree of formal structure involved. Here one analytical contrast stands out, with "statistical surveys" at one extreme and "reconnaissance surveys" at the other. The former characteristically depend on the use of standardized data collection instruments or questionnaires, which are administered by trained enumerators and generate reams of raw data. The results are then coded, aggregated and analyzed by tabulation or computer, and statistical conclusions are drawn regarding particular characteristics of the population under study.

The reconnaissance survey, on the other hand, is much less structured: it depends on an open-ended process of questioning and observation, conducted by one or more qualified rural development specialists who concentrate the collection effort on key informants (as opposed to "representative" respondents). The rationale underlying the reconnaissance survey assumes that it provides a way of synthesizing <u>data</u> rapidly into <u>information</u>,

drawing on the analytical skills of the rural development specialist.[1] In the statistical survey, on the other hand, the linkages between data and information are only implicit, and are often difficult to operationalize.

The distinction between these approaches helps to isolate the strengths and weaknesses of the various techniques and methodologies available to the decisionmakers. When rigor and precision are highly valued, the appeal of statistical surveys is likely to be strong; where a premium is placed on timely, qualitative analysis (which also indicates orders of magnitude for quantifiable features of a rural environment), the reconnaissance survey offers obvious advantages.

It will be apparent to the reader who examines Volume Two that there is no single methodology that falls at the midpoint of an imaginary continuum between the statistical survey and the reconnaissance survey. For example, several of the information system variants depend on statistical survey data, but involve a continuous collection effort or repetition of the survey at several discrete points in time. In the latter respect they are intended to capture some of the dynamic features of the rural environment and to indicate the rate and direction of change, a concern that is central to the reconnaissance survey approach.

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[1] "Data" refers here to specific data points, such as those used to complete entries on a questionnaire, e.g., age, residence, occupation. "Information" is data analyzed in a form that can be used in decisionmaking.

The fact that several of the options combine features of both of the "extreme" approaches makes it especially difficult to impose a uniform classification system.

For this reason, all that is provided here is a straightforward summary of the principle options available, to set the stage for an analysis of technical issues and selection criteria in the remainder of this volume. The reader is referred to Volume Two for a more detailed picture and for case studies illustrating applications of the various options.

Statistical Surveys

For the purposes of this report, this term refers to techniques that utilize data from a sample to make inferences -- i.e., to generalize about the characteristics of a larger population from which the sample has been drawn. Most commonly the statistical survey depends on enumerators who have been trained to administer a questionnaire or comparable collection instrument, with predetermined categories of data. For rural development, there are two principal alternatives that may be used in drawing a sample:

- The area frame sample utilizes a specified geographical area -- usually a small segment or "block" in the total land area of a region or country -- as the unit from which desired data are to be collected. Generalizations about agriculture and/or other economic activities within the total land area are derived by compiling data gathered within the selected segments.

> Population Sampling is used when the focus of the survey is on a particular target population or on specific categories within the population inhabitating an area. Here the basis of the sample is not territorial units but, rather, a given number of reporting units (e.g., households, individuals, farms) selected from the total number of such units. There are a variety of techniques for drawing a population sample: randomization, stratification, clustering, etc.[1]

The technical issues in sample design for statistical surveys are examined later in this chapter.

## Farm Records

This approach is intended to gather data on farm operations on a continuous basis over an extended period of time. Entries are normally made at very short intervals -- sometimes on a daily basis -- and this feature increases the quality and quantity of the data entering the system. This in turn tends to limit the size of the sample, whether an area frame or some form of population sampling is used to generate it. Although farm records have been used most often for purposes of research, they have great potential utility within ongoing projects in that they can monitor changes at the micro level that result from project interventions.

## Reconnaissance Surveys

As already indicated above, this approach is considerably less structured and formal than statistically oriented surveys.

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[1] The full range of techniques is reviewed in Volume Two, Chapter Four (pp. 49-72).

The reliance placed on the specialized individual skills of the collector/analyst contrasts sharply with the utilization of trained enumerators whose tasks are intended to be straightforward and "mechanical." The most frequent application of the reconnaissance approach is in project design, where one team carries out two discrete functions: (1) the collection of data on a local area, including data on the prospects for modernizing change, and (2) the specification of a proposed development strategy and intervention.[1]

Internal Project Systems

Internal project information systems utilize project staff as data collectors and analysts for purposes of ongoing monitoring and evaluation during implementation. Often such systems have built in more than one of the techniques listed above: for example, a reconnaissance survey might be followed by a statistical "baseline" study on selected problems, and then perhaps by a farm records system established for a small sample of farm units. There are several alternatives with regard to staffing an internal project system that are discussed in Chapter Six of this volume.

## SALIENT TECHNICAL ISSUES

A number of issues should be borne in mind by policymakers when they undertake to choose the approach that can best satisfy

[1] See Volume Two, pp. 151-176, for more detailed coverage of this point.

their information needs. The following discussion, although not exhaustive, highlights five issues of major concern that impinge on the selection process and effectively narrow the options available in any particular context. These are:

- Data collection constraints;
- Qualitative assessment;
- Alternatives in sample design;
- Dealing with sample size constraints; and
- Timeliness of reporting.

## Data Collection Constraints

If the needed information can be specifically identified and broken down into itemized data points, then, at least in theory, the data collection task can be assigned to relatively low-level collectors who work from a highly structured collection instrument. The process of data gathering in such conditions is then straightforward and mechanical. Unfortunately, the history of formal, structured surveys in Third World countries shows that there is a wide gap between theory and practice. The theory assumes that the technique used in surveys can be applied routinely by trained specialists. The case studies in this report demonstrate that the state of the art is still quite primitive, and that many pitfalls await the survey practitioner. One of the main constraints is that most surveys deal with diverse micro-environments where not only is the basic knowledge of the environment for structuring the survey missing but there

is also a lack of information on how to ask certain questions appropriately, how to treat informants, how to judge the reliability of responses and, even more importantly, how to interpret the data.

One approach to increasing confidence in the survey results is to precede the formal survey effort with an informal reconnaissance survey, and then thoroughly pretest survey questionnaires. This is an iterative process and may require several pretests before the final questionnaire is ready. In a number of case studies the questionnaire was pretested once, but after modifications were made the new questionnaires were not reevaluated or tested again; consequently, poor results were obtained. While decisionmakers generally rely on information system specialists to determine the amount of preformal survey work that must be done, they should bear in mind that: (a) this work is essential if the resulting data are to be accurate, and (b) such work is time-consuming.

The results of a one-time survey may appear accurate to someone sitting in an office many miles (or thousands of miles) from the survey or even to someone on site. Often the errors only become apparent when the data are analyzed or the sample is resurveyed. In a number of the case studies where resurveys and other testing were used to check the data, serious flaws were uncovered. Two cases that included special activities to test survey results were the Rural Dynamics Study in Indonesia and

the IRRI Cropping Systems Program in the Philippines.[1] Such testing has demonstrated weak elements and developed a sounder base for future surveys in that environment.

Presurvey testing and reconnaissance can improve the quality of data, but there are other constraints to obtaining reliable data that cannot be so easily corrected. For example, some informant biases may not be easily identifiable until after several years of project implementation. These factors underline the need for continuous upgrading of the data base -- from both a qualitative and a quantitative standpoint -- as a project moves from design into implementation. The task of upgrading presumes that the learning process does not stop with the termination of project design, but continues throughout implementation. This raises the question of how an internal project information system can be used to sustain the process. The materials in Chapter Eight of Volume Two treat the latter issue in considerable detail; a more concise discussion is presented in the final chapter of this volume.

## Qualitative Assessments

Although survey results can give the impression of precision and accuracy in the values reported for particular variables, there are obvious risks in accepting such results uncritically. Qualitative assessments are essential if the interpetation of

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[1] Volume Two, pp. 121-125 and 359-362.

results is to develop in a meaningful way, and these assessments ideally should draw upon the actual field experience of the enumerators, who can use their powers of observation to supplement the survey responses. In a number of the case studies reported in Volume Two, the enumerators were asked to assess data reliability following their field experience. In some instances, as much (or more) was learned from the field exercise as from the processed data. For example, in the surveys conducted for the design of the Logar Integrated Rural Development Project in Afghanistan (Volume Two, pp. 163-164), the data could not be hand-tabulated in time to provide inputs into the project design. However, the insights gained in the process of conducting the surveys proved extremely useful for the purposes of the project design.

As one moves from the formal, highly structured type of survey to the informal, ad hoc investigation, there is a greater dependence on the overall skills of those conducting the fieldwork. In the pure statistical survey the enumerator is trained in the mechanical tasks of asking predetermined questions and recording the responses. The "reconnaissance" survey, at the other extreme, involves the enumerators in part as decisionmakers who exercise their deductive skills as part of the operation. Some surveys fall into a middle ground, where the major information users cannot complete all the necessary fieldwork themselves, and enumerators are carefully trained to use structured questionnaires that incorporate qualitative assessments. In the

Sederhana Irrigation Project Evaluation (Indonesia) formal surveys were used with only limited results.[1] The evaluator saw the need for qualitative assessments and developed a questionnaire oriented to maximizing the interaction between the enumerators (who were project staff) and the informants. The survey was informal, in the sense that the responses were mostly narrative, and did not require tabulation or aggregation. The sample villages were selected on the basis of potential insights to be gained rather than on a strictly random basis. In the Sederhana example, the survey had to contain a certain degree of structure because of the need for a uniform interviewing pattern to permit comparison of the results, and because the enumerators were not experienced in the art of survey design and interviewing. The structure provided the quality control.

The reconnaissance and rapid survey techniques described in Volume Two, Chapter Six, are best utilized when the decisionmakers undertake the field investigations themselves. Since the survey approach is relatively informal, survey design knowledge need not involve advanced statistics, but should center on the questions to be addressed and the selection of informants. Survey design becomes an ongoing field operation where the material covered and questions asked are altered in response to findings to date. When the field personnel are confident about the order of magnitude or direction of a variable under study, they may

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[1] Volume Two, pp. 325-329.

then decide to eliminate the variable from the inquiry and introduce others. Such a survey may start with many unknowns and many questions, but as more is learned questions can be eliminated and concentration placed on those variables that are still unclear.

The extreme case of a reconnaissance survey has the decisionmaker or his delegate work with an unstructured set of questions, some of which may not be fully formulated at the outset. If those undertaking such a survey are well experienced in rural development, know basically what they are looking for, and can interpret their observations within a rural development context, this approach can be highly effective. However, without sufficient rural development experience, observations might not only be meaningless but also misleading. The experienced rural development practitioner should know what kind and quality of information is obtainable with this approach and whether it is sufficient to meet the needs identified by policymakers. If those needs are relatively modest -- e.g., a determination of the potential of a given area for agricultural development assistance -- the information can be generated in a systematic and efficient fashion. The unstructured reconnaissance survey is not intended to meet every decisionmaker's information needs.

## Alternatives in Sample Design

All studies or surveys that provide information by examining only a fraction of all of the units (e.g., farms, households,

industrial firms, families) of a given universe of objects, can be referred to as statistical, if indeed the desired properties or qualities of the entire set of units are inferred by determining those same properties or qualities for the smaller set studied (the sample).

In order to determine whether this inference is valid, the statistician must know a great deal about the relationships between the sample (the smaller group studied) and the whole (the universe). If certain population characteristics are of major importance in the survey, the statistician can use stratification techniques to set up the sample in terms of these characteristics. For example, if income is to be studied, then he must know something about the income characteristics of the population, so that the sample can be selected proportionally from each of several different income strata. If farm size is known to be an important variable, then members of each of several different farm size groups must be included in the sample. This results in a requirement for a great deal of information in order to choose a sample that will be "representative" of the total population to be studied.

There are several standard ways to go about selecting samples. When doing household surveys, it is common to use a population or household census as a master document from which to choose the sample. Ideally the census lists every household in the country (or region, or district) together with enough infor-

mation about income, family size, sex, age distribution, economic status, etc., to generate a sample that is representative of the whole population in a given area. A sample selected in this manner is usually called a "household" survey if the units are households, a farm survey if the units are farms, and so forth.

The sample can be developed by using a population frame or an area frame. In general, population frame sampling is preferred to area frame sampling if the objective is to trace a given population through time. Area frame sampling may be more useful if the purpose is to trace the changes in land utilization (production, productivity) over time.

In many developing countries, high migration rates make the tracing of a given poulation over time very difficult. Many longitudinal surveys have foundered on a disappearance rate that cut into the original sample. Migrants enter and leave an area, and the old and poor may remain while the young and more affluent may depart. If the question is one of what is happening to an area -- as in area development -- area frame sampling may provide the most insights. If the question is one of what happens to a target population that was in an area at the beginning of a project, longitudinal tracking using a population frame will be most insightful. In addition, time series cross-sectional surveys on a population frame can offer insights into changes in mean values of important variables within the sample population.

Of the two techniques, area frames cost more to develop, require more upfront technical assistance and depend on accurate aerial photography/mapping. However, once in place and with minimal updating, an area frame can be used for years on many different subjects of interest to decisionmakers. Population sampling is usually less expensive and easier to initiate but it eventually requires some degree of new sample selection when a resurvey is desired. This procedure is time-consuming; if not given sufficient attention, it will limit the usefulness of the results. The tradeoffs between are frame and population sampling should be clearly assessed before a decision is made on sampling methodology.

Dealing with Sample Size Constraints

In striving for data that can provide an accurate profile of the total population, sample size is an important consideration. If there is little variance among the population characteristics that will be measured, a small sample will be adequate. If the population is more heterogeneous and consequently a high variance is expected for the critical variables, a larger sample is needed. There are special formulas for determining appropriate sample size, but the variance information that must be plugged into the formula may be missing *ex ante* or there may not be enough money or time to cover the appropriate sample identified by the formula. These unknowns make it very difficult to estimate sample size and often necessitate accepting results

that have a high statistical error. There are alternative approaches to sampling that may introduce biases or higher error, but these are accepted tradeoffs in order to focus the survey on the most important population characteristics.

The ideal sampling technique in many statistical surveys is to use a random sample where each unit of the population has an equal chance to be included in the sample. However, the decisionmakers may be interested in the lower income brackets of the population (or some other characteristic). Cluster sampling is a technique used to concentrate resources on those areas or units most amenable to interviewing (e.g., good location, openness to interviewer questions). Purposive sampling is used to select subgroups of the population according to a perceived value of the subgroup in relation to the objectives of the survey.

Purposive sampling is an important element of reconnaissance surveys, where the number of people to be interviewed is necessarily limited and those selected must be able to provide the needed information. One approach to covering a broad spectrum of the population is group interviews where the interviewers address questions to the group at large. This technique was used very successfully in the design of the North Shaba Rural Development Project in Zaire, where the group participants were able to provide an in-depth view of village conditions and problems.[1]

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[1] Volume Two, pp. 161-162.

Yet group interviews can also be counterproductive when there is a lot of mistrust either within the group itself or between the group and the interviewers. In the design of the Gamo Gofa Project in Ethiopia, group interviews did not prove productive because the low level of development and lack of prior exposure to outsiders did not allow a free exchange of ideas in a group setting.[1] A strong leader with a different point of view from other members of the group may intimidate them, and thereby promote a stilted discussion. The Logar Integrated Area Development Project design work in Afghanistan experienced a bias from group interviews, because the village leaders responsible for organizing the groups generally chose the more affluent villagers.[2]

While interviewing a village leader may introduce biases for certain types of information, such interviews are not without value. Indigenous leaders are generally well informed, and may even be able to provide detailed household-level information in certain categories. However, the interviewer must be able to distinguish and anticipate the biases of informants. Group interviews and leader interviews are especially useful in open-ended reconnaissance surveys because interviewers can formulate new questions on the spot from information already received. Statistical surveys can also use group and leader interviews for surveys in which the reference unit is the village.

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[1] Volume Two, pp. 159-161.

[2] Volume Two, pp. 163-164.

Timeliness of Reporting

The question of time becomes critically important when planning a data collection effort and weighing various possible approaches. The more structured the approach, the more time is consumed in the survey operation. A statistical type survey often requires presurvey reconnaissance work and considerable pretesting if the area or population has not been surveyed before. The enumerators have to be trained (the pretesting can sometimes be part of the training process). A sample frame has to be developed, and if an area frame is to be used considerable time has to be allotted for mapping and/or photography to demarcate the units of analysis. For a population frame a short questionnaire may be needed to obtain a good sample and identify variables for stratification.

Completed questionnaires need to be reviewed for gaps and inconsistencies, and when these occur it may prove necessary to reinterview some or all of the informants. Reinterviewing by supervisors may also be used to identify weak data elements. Coding sheets have to be developed (if the questionniare was not already precoded) and the data transposed. If more than the most rudimentary forms of analysis are to be used, and if the data are to be hand-tabulated, this will take considerable time. If a more sophisticated analysis is planned, computer programs must be developed and the data punched on cards, taped and then run. By the time all this has been done, several years may have passed and the utility of the data seriously diminished.

In many of the case studies it was found that report deadlines had been missed due to the need to fill data gaps or due to unforeseen difficulties in processing and analyzing the data. Often the survey designers underestimated the difficulties of processing large quantities of data.[1] Planning the analysis is often left until after the data has been collected. While this is a reasonable approach insofar as the potential relationships among the data may be clarified during the data collection process, it becomes a difficult chore when faced with missing data or weak data for certain variables, or (at the opposite extreme) a data overload. In many Third World countries mechanical card punching and computer operations can often create snags due to inadequate facilities and poorly trained staff.

The long delays experienced in turnaround time for processing and analysis of survey data pose difficult choices for policymakers who legitimately require detailed and precise information. The tradeoff between promptness and precision in the reporting of results is only one of many compromises that often must be struck in the selection of an information approach.[2] There are situations in which highly structured surveys and sophisticated analysis are valuable.

In large projects involving numerous activities but lacking in staff that can be used for data collection and analysis pur-

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[1] The Colombia Rural Household Survey conducted in 1972-73 is a case in point. See Volume Two, pp. 99-100.

[2] This is discussed in greater detail in Chapter Six of this volume

poses, the only reasonable method of obtaining a clear understanding of project impact may be a statistical survey. With sufficient application of resources, this information strategy can have a turnaround time of less than six months from start to completed report. So long as the project decisionmakers understand the limitations of this approach and accept the costs as realistic, the structured survey will deliver information that can be important in evaluating a project's impact and in suggesting modifications in operations to improve performance in the future.

# CHAPTER FIVE

# BARRIERS TO THE UTILIZATION OF INFORMATION SYSTEMS

## INTRODUCTION

In the preceding chapters attention has been focused on specifying information needs and on the decision process to follow in selecting appropriate information collection techniques. However, as suggested by the case study material presented in Volume Two, there are often serious barriers to the utilization of information systems in rural development projects. The case studies suggest:

- That there are very few effective information systems in operation that are inexpensive enough to permit extensive replication; and
- That while there are serious methodological problems, they are not the only nor the primary reasons for the dearth of information systems in use.

Robert Levine, the former head of the U.S. Office of Economic Opportunity, suggested that information utilization problems are not unique to Third World rural development projects:

> Time and time again, Federal agencies at the top have tried to impose nationwide data systems; they have always failed.[1]

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[1] Robert A. Levine, *Public Planning*, New York: Basic Books, 1972, p. 149.

Clearly the problems of making an information system work in a rural development project differ from those in a national-level system. However, in both instances it is worth pausing to reflect upon the barriers to utilization.

The purpose of this chapter is to summarize the findings on barriers to the utilization of monitoring/evaluation systems, and to indicate possible ways of surmounting them.[1]

## THE POTENTIALS FOR PROJECT MONITORING/EVALUATION SYSTEMS

Ideally, project monitoring/evaluation systems should:

- Track inputs and outputs against schedules;
- Measure project effects (impacts);
- Identify current and upcoming problems;
- Diagnose reasons for problems; and
- Prescribe solutions that the project can put into effect.

The discussion of these items is selective and short because the problems have more to do with the realization of these potentials than with their specification. Little needs to be said

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[1] Although comparable utilization problems exist for sector, national and international systems, the following discussion focuses on the utilization problems facing project managers. Project information can also be useful to project participants. Getting small farmers to use project information involves a set of problems that will not be discussed here.

about the first item, since the need to track inputs and outputs is recognized, and most projects have systems that accomplish this task to a greater or lesser extent.

Over the last decade it has been recognized that the timely achievement of project outputs (e.g., the completion of roads, bridges and buildings) does not ensure the attainment of project goals (i.e., output achievements are not proxies for goal attainments). This realization, coupled with new foreign assistance directives to focus benefits on the rural poor, has necessitated efforts to measure project effects directly. Considerable creativity is required for the design of an information system to measure significant project effects at reasonable cost.

To be of greatest use to project managers, though, a monitoring/evaluation system should go beyond the measurement of project effects. It should also be capable of identifying upcoming problems, diagnosing their causes, and generating information that leads to their resolution through project modifications or project redesign. It should also provide the basis for replication of the project elsewhere.

Getting an information system to deliver on all of the potentials spelled out above is a tall order. This chapter began with the observation that very few projects have information systems

that even begin to realize these potentials. The purpose here is to indicate why, even when information is generated which has potential value, it may not be used.[1]

## WHY INFORMATION SYSTEMS ARE NOT USED

### Threat to Project Management

It would be naive to ignore the fact that formal monitoring and evaluation activities can be seen as a threat by project managers. The situation is clearly depicted in the following quote from an expert on information utilization:

> Organizations invariably respond to factors other than the attainment of their formal goals. Even rudimentary knowledge of organizational behavior indicates the salience of the drive for organizational perpetuation, personnel's needs for status and esteem and their attachment to the practice skills in which they have invested a professional lifetime, conservatism and inertia and fear of the unknown consequences of change, sensitivity to the reactions of various publics, costs, prevailing ideological doctrines, political feasibility, and the host of other considerations that affect the maintenance of the organization. Evaluation's evidence of program outcome can not override all the other contending influences.
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> A fascinating example of resistance to utilization can be borrowed from military history. In 1939-41 the RAF Bomber Command refused to accept the evidence of aerial photography on the failure of its missions.

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[1] It should be noted that a considerable amount of research has been one on the utilization of information, e.g., Carol H. Weiss, editor, *Evaluation Action Programs: Readings in Social Action and Education*, Boston: Allyn and Bacon, 1974. Unfortunately there has been little research on this question in the context of rural development projects.

> Photographs indicated that only one of every four aircraft reporting an attack on target had actually gotten within five miles of it. An officer who passed on to his chief an interpretation showing that an attack had missed its mark found it later on his desk with a note scrawled across it in red: "I do not accept this report." The author of the account of these events states, in words that will echo familiarly to social evaluators, "it was very natural that many of those whose work it affected jumped to the comforting conclusion that something must have been wrong with the camera or the photographs or the man who wrote the report."[1]

Of all the case studies presented in Volume Two, only those in Chapter Eight, "Internal Project Systems," were capable of providing information for use in improving project performance. The remaining information systems described were too far divorced from project management to be useful, and thus were not seen as threats. The cases in Chapter Eight exhibited the following "threat levels":

- Northern Tanzania (Hanang) had an information system originally designed into the project with the full participation of project management and staff. The requirement to specify the mangement's actions and measure achievements against stated schedules or goals proved so threatening that this aspect of the system has been discarded. Impact evaluation is forthcoming. The project's information activities are completely integrated into the field staff's job assignments, with continual feedback and revision. As a result, the information which is being generated is used on a regular basis (pp. 235-279).

- The ORDEZA system in Huaraz, Peru was designed but never implemented. Among other obstacles was the threat seen by management (and the host

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[1] Carol H. Weiss, "Utilization of Evaluation: Toward Comparative Study," ibid., pp. 319-20.

country government) from an information system concentrating on impact and target population benefits funded by the foreign donor, placed in the midst of an ongoing development project (pp. 281-284).

- In the Bicol River Basin Development Program, the evidence of threat to project management was most convincing, largely because the information system was highly developed. This was an instance where an autonomous, academically oriented organization with contacts extending above the level of project management, was able to report its findings and conclusions to a wide audience. There were other complicating factors of course, which led to the decision to redefine the information system and eliminate the external reporting capacity. However, there is evidence that a sophisticated and independent information system, however carefully its findings are reported, can easily run aground on the shoals of management sensitivity and nervousness. When the information system becomes "them" against the "us" of the project, it loses the ability to improve performance, except by reporting to higher authorities, who then decree changes in project priorities or operations. This is unlikely to generate a self-sustaining working relationship between project management and the operators of the information system (pp. 285-300).

- The Masagana 99 program in the Philippines provided fast-response data, initially on rice production, which duplicated the more traditional crop-cutting reports on anticipated agricultural yields. Consistent overreporting appears to have been one explanation for the underuse of these data, along with the placement of reporting requirements within the same agency which has responsibility for the more conservative (and believable) agricultural production estimates. A complementary synthesis of the two reporting systems could provide major benefits. The fact that it has not been accomplished is attributable in part to a perceived threat to the older, more established crop-cutting reporting staff (pp. 301-305).

The other projects in the sample of case studies have not yet generated sufficiently strong data bases or findings to

become a threat. This in turn illustrates one of the problems inherent in internal project information systems. In the District Development Program in Kenya, the emphasis has been on gathering and reporting financial data, with little effort expended on impact assessment. There appear to be two reasons for the observed pattern. In the first place, it is much easier to collect, organize and present budgetary data than it is to operationalize meaningful measures of the impact of development assistance. Second, even if a methodology were readily available for the latter task, it is doubtful whether project implementors (in this case, district-level government officers) would apply it and report the results in an objective and consistent fashion.

The additional problem has been the lack of complementarity between donors, who lodge requests for evaluation and impact data, and host country government agencies, who may have quite different objectives for the same development project. One information system designer writes:

> It is typical that donors ask for more information on project performance than the management of the executing agency in the receipient country. This was undoubtedly the case in the Rasuwa/Nuwakot project [Nepal]. The Bank initiated the impact evaluation activity, and continued to show more interest in the evaluation activity than the local authorities. The Bank demanded a quarterly progress report as a condition for entertaining reimbursement claims from the Government. As a consequence the preparation of the reports became too much of a ritual for ensuring the release of money.
>
> An analysis of some aspects of the development cooperation between Sweden and Tanzania, including reporting carried out by the author, gave reason to question

> the demand for information placed by SIDA on Tanzanian authorities; the information was to a surprisingly limited extent used by SIDA.[1]

Demands by donors for information are often seen by the host country as: (a) a threat or (b) unnecessary; and thus the task is performed in only a perfunctory manner. As a result, the information generated, however helpful it might have been, is packaged and sent to the donors, rather than used in the redesign and ongoing improvement of the project.

To a greater or lesser extent, formal project information systems will threaten project management. The threat will be greater if the information system emphasizes summative evaluation rather than problem identification and resolution.

Management Inability to Anticipate Information Needs

It appears that project managers and other key project policymakers find it difficult to specify in advance what information they need to monitor and evaluate project activities. This task then falls to so-called "information experts" who take it upon themselves to construct information systems for particular projects. . . . . .

This is frequently the beginning of the end; the information specialists design the system in a vacuum, and it ends up being irrelevant from the standpoint of perceived needs of the potential

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[1] Lars Birgegard, "Some Problems Related to the Design and Acceptance of an Information System Experienced in a Multisectoral Rural Development Project," for the OECD Workshop on Information Systems for Rural Development Projects, Paris, March 20-22, 1978, pp. 12-13.

users. This was dramatically demonstrated in the Rural Dynamics study in Indonesia (Volume Two, pp. 121-125), where information system designers canvassed policymakers in order to specify their perceived information needs. In this instance, as in many others, the decisionmakers argued that it was for the research institute to tell them the appropriate information needs. In the absence of clear guidance on what was and was not useful, the project's system collected "everything" with over 1,000 village-level variables, far more than could be accurately collected or usefully analyzed.

In some instances, information specialists fail to contribute to project decisionmaking because their mandate is broad and ill-defined. Decisionmakers indicate a general preference -- often for socioeconomic data -- without specifying the form in which findings should be presented or the type and level of analysis required. In the early stages of the Chao Phya Irrigated Agricultural Development Project in Thailand (Volume Two, pp. 119-120), a large amount of socioeconomic data was called for and obtained on a stable and relatively small (259) rural farm survey. However, the inability of the researchers to find a useful way of analyzing and presenting the data -- reflecting not on their competence, but on the vagueness of their mandate -- has caused the deletion of that portion of the questionnaire, and the elimination of the socioeconomic variables from the information system.

The failure to communicate information needs was a major source of difficulty in applying the results of the Integrated Development Planning Project to block planning exercises in India (see Volume Two, pp. 127-130). Senior researchers designed and executed an ambitious household survey, but without inputs from block planners, who were to be the ultimate users of the results. As a consequence, when it became clear that the household-level data were too fragmented and disaggregated for use in block planning, 90 percent of these data were never put to their anticipated use.

Knowing what data are needed for decisionmaking requires experience and sophistication in the use of information. In projects where this is well developed, as in the Bicol (where management agreed in advance not only on the issues to be addressed, but the format of the questionnaire and the level of accuracy in measurement), the information specialists can work within established guidelines. Where management does not have this experience or knowledge, the specialists must decide, and this has been the cause of numerous interesting, but unused data collection and analysis exercises.

Excessive Cost and Complexity

It frequently occurs that a specialist is hired to design a project information system but is given no responsibility for system execution. Under these circumstances, it is not surprising that information system designs ofen err on the side of

being too complex and costly to be implemented (i.e., for five person-weeks of work it is "safer" to submit a 30-page data collection document than a one-page document, even if the latter is more appropriate in light of available project resources).

One development professional offered the following conclusion after working in major donor-funded development projects:

> Of considerable importance is what may be called the professional imperative. Every textbook and every seminar on development management or micro planning stresses the significance of project evaluation and teaches numerous aspects, all important, to bear in mind when designing and operating such evaluation systems. When it comes to determine the content of an information system, it is interesting how often comprehensive lists of information headlines result by simply asking: "How could a project of this size be managed without this information?" To say that it could would be regarded as almost irresponsible and dubious from a professional point of view (no good manager would say so). To hire specialized experts, whose high salaries imply that their field is 'important' and 'difficult,' to design evaluation systems adds to the danger of over-production.

Original DAI designs in Bolivia and Peru (ORDEZA) followed the work of the American Institutes for Research on impact asessment in Thailand, which was conceptually path-breaking in its focus on behavior rather than perceptions. None of these efforts survived the departure of the technical assistance teams. The original concept for the Bicol River Basin information system in the Philippines had many facets, including a troubleshooting team that would respond to incipient problems, which never saw the

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[1] Ibid., p. 12.

light of day. The Lam Pao irrigation study in northeast Thailand, which now delivers fascinating and academically thorough data, was six years in the making, at an expense which makes it improbable that the model will be duplicated in ongoing development projects. In a major study in Indonesia focusing on rural dynamics, the conceptual consistency of the data collection system, which attempted to answer a multitude of academically inspired questions, staggered the project with data overload. Many of the case studies reported in Volume Two never delivered anything useful beyond an involved research plan. It was an academically oriented office in AID which generated a sample of 17,000 rural households in Colombia in 1972, which has yet to produce a useful output.

The desire to be conceptually innovative and academically sound produces formalized, extensive and complex data collection and analysis systems. This is further compounded by an emphasis on information "related to policy issues" rather than "relevant to policy decisions." The "related to," at least in rural development, is virtually synonomous with "everything": the effect is to increase the intricacy of the information system and correspondingly reduce its usefulness to project management.

## Decisionmaker Involvement in Data Collection and Analysis

It is reasonable to suppose that the more decisionmakers are involved in, understand, and trust the data collection system, the more likely it is that they will make use of the results.

In the case of most computerized farm surveys (Volume Two Chapter Five) the decisionmaker is totally absent from the design, collection or analysis of the data (which is often funded by AID for purposes of project approval or target population identification). The results come to him, if at all, in a bound report. If advanced quantitative analysis techniques have been used, the lack of understanding of the analytical methods may also reduce the decisionmaker's willingness to act on the findings. In systems in which the decisionmakers are directly in the flow of information, as in Hanang (Northern Tanzania), or where they are called upon to meet frequently with project participants, as in the Kenya Tea Development Authority scheme,[1] there is an instant recognition of the data source, and an assessment of the reports. This has led to a suggestion for regular systematic meetings between participants and project staff, including top management, as one rapid and effective means of data collection and analysis on project impact.

Some of the more interesting experiments in involving decisionmakers in data collection and analysis have occured after the relative failure of more formalized systems. This was the case in the Sederhana Irrigation Project in Indonesia (pp. 325-329, Volume Two) where an entire collection effort was designed around the need for project staff to learn firsthand about the constraints and problems in producing positive impact from small-scale irrigation systems. In the Basic Health Services Project in Afghani-

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[1] *Strategies*, Volume II, pp. 137-148.

stan (Volume Two, pp. 331-333), where the knowledge base was exceedingly poor, the lack of rigor and statistical validity was well matched by the involvement of the staff in fieldwork, and the rapid communication to the project management of findings which were incorporated into project redesign.

## How Adequate are Existing Systems?

This report has noted that donor agencies involved in rural development have become increasingly concerned with the design and establishment of relatively sophisticated project-level information systems. While this concern is understandable, and can be traced to the desire for an improved understanding of project performance, it has created the impression that formal, elaborate systems are the answer to the decisionmaker's dreams. As a corollary, it is often argued that acknowledged project failures were due to the absence of an ongoing information system.

The impression is misleading, insofar as it suggests that some project managers actually do their jobs without obtaining information in a routine manner. In reality, every project manager has a "system" for information use in day-to-day decision-making, though it may be relatively informal and unstructured, and its outward manifestations may be difficult to discern. Despite the lack of rigor and sophistication, a system of this kind is often adequate for supplying the project manager with a basis for sensible decisions. Furthermore, experienced project managers are naturally inclined to believe in the systems that have evolved

under their direction, either in previous projects or in the initial stages of an ongoing project. When outside consultants are brought in to design a comprehensive information system for an ongoing project, the requirements they impose may easily overload the informal and less structured system favored by the project manager. Ultimately, considerable discretion rests with the project manager regarding the degree of reliance on a newly proposed system. It is not at all surprising -- and the case studies provide several examples of this -- that managers frequently choose to stay with the informal systems with which they are familiar.

Insufficient attention has been given to the types of information systems already in place in rural development projects. The search for expertise and the emergence of a subdiscipline of "information specialists" have diverted attention from an analysis of established and ongoing systems whose very informality may prove to be a valuable asset in certain situations. These systems deserve to be explored in greater depth.

## Other Reasons Why Information is not Used

A project has a schedule of decisions to be made and, at least in agriculture, little delay can be accepted. Baseline studies which take two years, or evaluations whose findings follow the decision deadline by a month, are bypassed by the march of time. Even the most efficient household surveys require six months (and these are exceptional; 12 is a better average),

and can engender major costs in information delays while evaluations commissioned at the last minute may be fast but not thorough. If an information system is to be responsive to decisionmaking needs, it must accept the decision timetables set by management. This will help determine the selection of the methodology to be used.

Evaluations are sometimes not used because the recommendations are beyond the power of policymakers to implement. Recommendations may also not be followed because they are not compatible with the constraints that project managers face in the real world; they will almost certainly be ignored if they are either not understood or not trusted by policymakers.

The tale is often told of a problem Coca-Cola encountered many years ago when the vending machine price had to be raised from five cents because of inflation. After a lengthy and expensive study of the problem, a consulting firm came in with the recommendation to increase the vending price for a bottle of Coke to seven and one-half cents.

If project funds must be spent in a predetermined way on specified activities and on a fixed schedule, there is no point in investing resources in a monitoring and evaluation system that shows how to redesign the project to improve its performance. While such inflexible project designs do exist, it is doubtful that such rigidities would stand up to solid documentation, provided by one ongoing monitoring/evaluation system, indicating that changes are needed.

## ROOT CAUSES OF NON-USE AND REMEDIES

The reasons why information systems are not used stem from one or both of two primary causes:

- Project management has insufficient appreciation of the potentials of a monitoring/evaluation system; and/or
- The system design does not reflect the needs of and/or constraints under which the project operates.

Case studies and the information utilization literature provided through documentation that:

- Policymakers (read project managers) cannot anticipate their information needs; and
- Policymakers are oriented to solving current problems and can rarely sustain an interest in the design of an information system.

Consequently the information system design is turned over to information specialists. The information management literature suggests that information specialists:

- Have trouble distinguishing between relevant and "related to" data;
- Spend more time than they should conceptualizing rather than customizing information systems for specific applications;
- Give too little time to the cost dimension of establishing and maintaining information systems; and
- Are biased towards formal, statistically rigorous information systems.

The result is often an overly ambitious information system which requires foreign consultants and constant tinkering by high-level specialist talent to keep it running, and a significant commitment of scarce resources and time. When the information system does not pay off quickly, as it is not likely to do, management questions the effort and allows dust to settle over the complex plan. If project managers are not able to stop an ongoing effort -- for example, generation of baseline data with re-survey schedules which are built into foreign donor funding -- they ignore the results, except as public relations documents for higher government authorities or international consumption. Either way, little of the systematic information generated is translated into modifications and improvements in project performance.

In the design of information systems, the following tentative recommendations are offered to increase the likelihood that data collection and analysis will be used in rural development decisionmaking:

- Start by gaining an understanding of information systems already in place, including informal communication networks;
- Increase the ratio of customizing time to conceptualizing time;
- Build the information system into the project design, so that management has the responsibility to deliver on this mandate from the outset;
- Design systems which involve, to the greatest extent possible, regular participation of

project staff and management in the collection and analysis of the data;

- Keep the systems simple, understandable and responsive to changing management needs, and solution- rather than grading-oriented; and

- Introduce information systems into ongoing projects only if management is thoroughly involved and committed to the concept. Where various data collection and analysis efforts are already in place, try to rationalize them to project needs, rather than create a new, potentially more threatening and redundant system.

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# CHAPTER SIX

# SELECTING AND IMPROVING INFORMATION STRATEGIES FOR DECISIONMAKING IN RURAL DEVELOPMENT

## INFORMATION STRATEGIES FOR PROJECT DESIGN

### Introduction

Information strategy alternatives during design include those which are lightly structured and follow the reconnaissance survey model, or highly formalistic and follow the statistical survey model.[1] In addition, the design of the project can be generated sequentially -- after the basic information has been gathered -- or simultaneously -- while the design team is formulating ideas and drawing up plans. The combinations and permutations of these basic options are the subject of the following discussion.

### Restating the Information Requirements for Rural Development Project Design

Chapter Three proposed the following information requirements for project design:

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[1] Data collection and analysis options have been summarized in Chapter Four of this volume, and presented in detail in Chapter Five (Statistical Surveys) and Chapter Six (Reconnaissance and Rapid Surveys) of Volume Two.

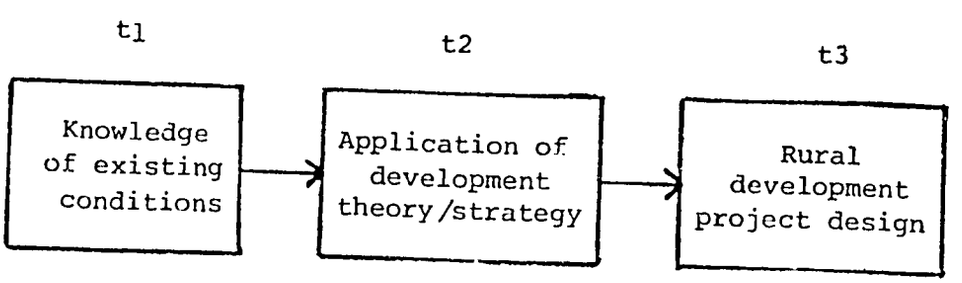
Technical specifications

- Understanding the project environment;
- Determining an appropriate development (intervention) strategy;
- Fitting the project strategy and components to regional/sectoral/national objectives; and
- Establishing objectives for each target group.

Organizational specifications

- Determining the appropriate project structure and the relationships with existing organizations;
- Defining workable management arrangements for the project; and
- Establishing a commitment from within the host government to implement the project as designed.

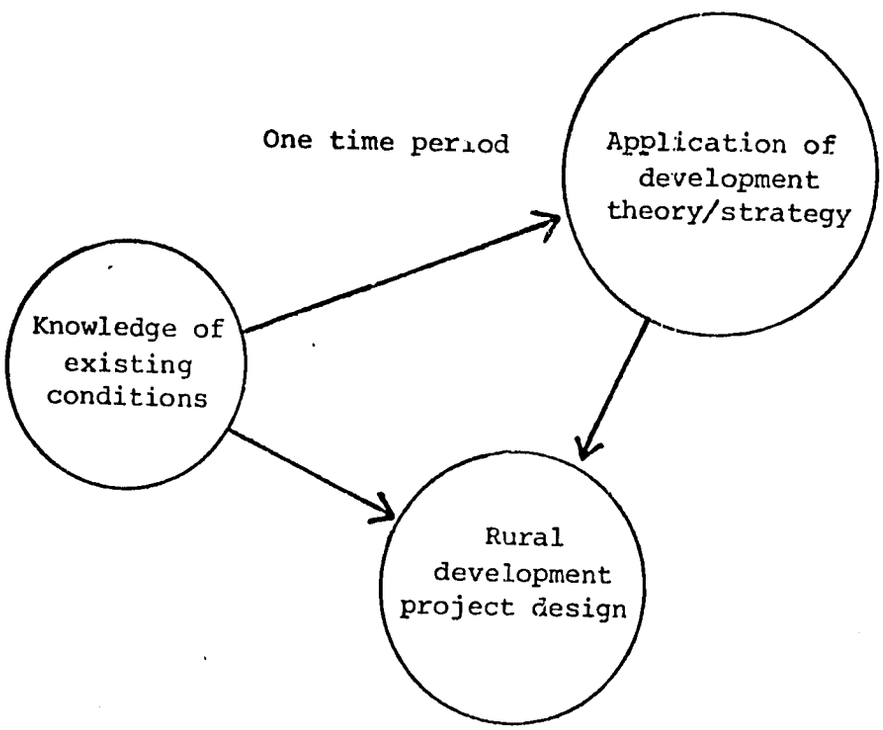
Project design emerges from combining information on existing conditions within a project area with information held by project designers on the theory/strategy of rural development. This process may be sequential:



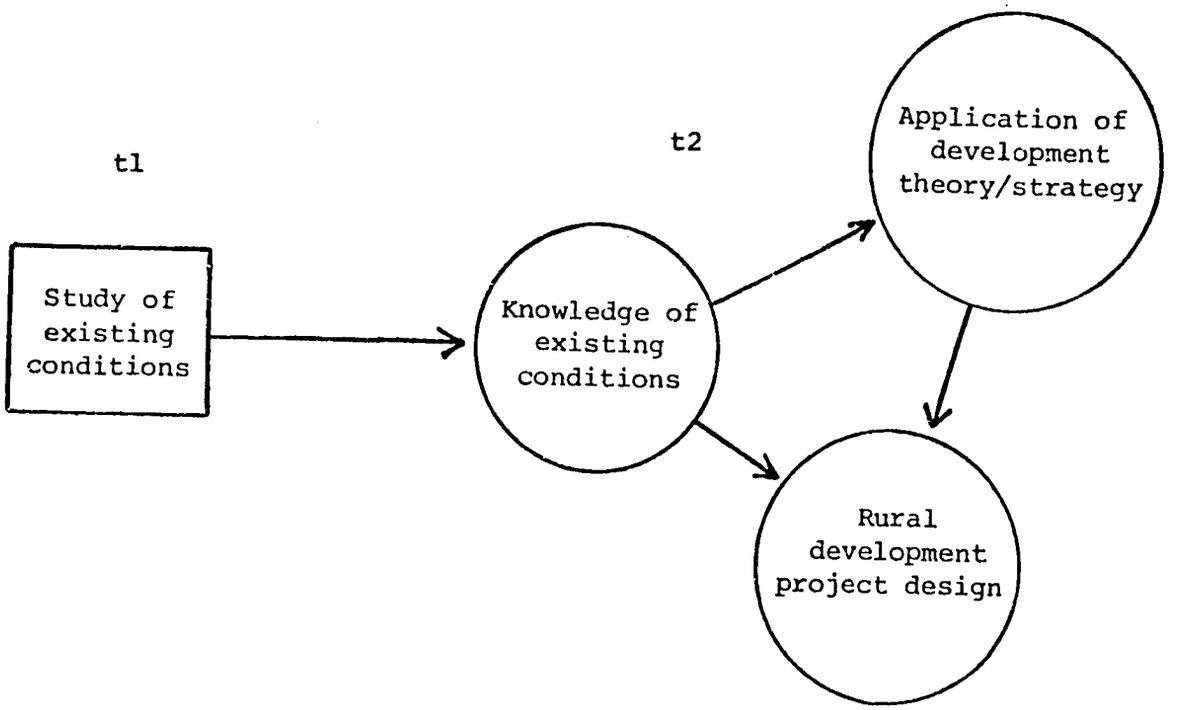

In this model the knowledge of "what exists" may be provided by either of the two data collection models (statistical surveys or rapid reconnaissance), but each step will occur in a different

time period and may be performed by different people.

Alternatively, the process may be simultaneous:




In this situation, only one information strategy -- reconnaissance surveys -- may be used and the entire reiterative process must be carried out by the same team of development professionals. A useful variant on these two models has been to define data requirements that can be filled by social scientists who may have little "design" experience, then include the data collectors as part of the design team. This sequencing would be:




## Meeting Information Requirements

It may be useful to compare certain characteristics of the two basic data collection models -- reconnaissance surveys and statistical surveys -- in terms of their ability to meet the technical and organizational information requirements for the design of rural development projects.

### *Technical Requirements*

*Understanding the Project Environment.* A reconnaissance survey calls for fieldwork by development professionals seeking information on the political, social, cultural and economic dynamics of the area. Much more information is gathered than is committed to paper. The emphasis is on reactions to proposed alternative interventions by leadership and project participants.

A statistical survey provides a great deal of information, and often more detail, on specific magnitude variables -- age, education, employment, income levels, perceptions, etc. Linkages and dynamics are usually less forthcoming from structured surveys, especially if the enumerators are not trained to seek out and capture dynamics.

*Determining an Appropriate Development (Intervention) Strategy.* This can only be done through the application of a body of development theory to the knowledge of existing conditions in the project area. The more information available to the designers (who are assumed to hold the development theory knowledge) the better. Here more will be gained from a four-week field trip than from a four-volume statistical survey report.

*Fitting the Project Strategy and Components to Regional/Sector/National Objectives.* A formal survey, if available, is not applicable to this task. Designers are needed for the same reasons as given directly above.

*Establishing Objectives for Each Group.* General objectives must be set as project guidelines. The statistical survey methodology may be useful in generating certain "baseline" indicators that can be remeasured during implementation. The reliability of statistical surveys in capturing such important variables as household income is, however, highly suspect.

*Organizational Requirements*

*Determining the Appropriate Project Structure.* This is another complex design component based upon what exists -- which is not a matter to be determined by a representative sample of the rural population -- and what might work best in the given environment. Knowledge of the decisionmaking processes of a host country government at the district, provincial and national levels is critical in this task. This knowledge can best be gained by observation, and discussion, by development professionals.

*Defining Workable Management Arrangements for the Project.* No part of the design offers more potential for calamity than this component. Designers need a great deal of information on the cooperation between and among government agencies, resources to be committed, likely changes in government structure, and the ability of the line agencies to supply assistance as promised. These "substance" decisions are made by project designers based upon the best information available. That information is obtained by individuals assimilating, aggregating, collating, synthesizing and analyzing the possibilities for alternative project structures.

*Establishing a Commitment from Within the Host Government to Implement the Project as Designed.* A statistical survey may be used to demonstrate findings to host government officials but this should be supplemented by a reconnaissance survey in which

government officials from the concerned ministries join in collection, hypothesis testing, project design, justification and presentation to higher levels in the government.

Conclusions Regarding Project Design

A reconnaissance design team of four members, working for eight weeks, will cost the U.S. Government approximately $75,000. In that time, if the team's parameters have been well specified, if interaction with the USAID Mission is positive, and if the team's personnel are experienced and capable, a completed project design will emerge which has been negotiated with the host government and written in the format required for presentation for project approval. With the same amount of money a statistical survey can be completed in six months (if the work is efficiently generated). When the work is completed, there will be a data tape and pages of tables, but no project design. However, this data may prove useful in project design as part of the basic knowledge of existing conditions in the project area.

Whichever data collection model is used, a better project will generally emerge if project designers have learned for themselves the complexities of relationships among the project beneficiaries, between target population and government, and among the government agencies responsible for development. This generally means that a reconnaissance survey should be used in virtually every project design even if a statistical survey has already been completed. Reconnaissance surveys are cost-effec-

tive and fast -- from contract to completed design documents in two months. The knowledge gained in design can be continued, should it be important, into the implementation phase. Host country officials who have been part of the process are more likely to commit their time and resources to making the project work.

## INFORMATION STRATEGIES FOR PROJECT APPROVAL

Theoretically, projects are designed in order to facilitate implementation and to give the project a reasonable chance of success. In the real world there are strong incentives to package a design in such a way as to get the project approved.

In contrast with project design, packaging for project approval requires more detail, more calculations to show the project is economically justifiable, more information to satisfy each office that has a voice in the approval process. During project review, it is common for reviewers to request more data in order to satisfy a particular legal requirement or a particular bureaucratic interest group. In the process, a great deal may depend on personalized interpretation or discretionary judgments. Each agency, each department, each bureau has its own particular set of requirements. It is not the "handbook" but the interpretation of the requirements in the handbook which is critical. These special information requirements can only be

learned from those directly involved in the approval process.

A particularly onerous justification, which may be a carry-over from a banking requirement, is an internal rate of return or cost/benefit calculation. The World Bank regularly computes such statistics and sets standards which its projects must meet. AID requires such calculations only for a small subset of projects -- e.g., those with irrigation components -- and generally is more flexible in the application of any quantitative methodology used in the approval process. One of the bureaus of AID utilizes a small farmer computer program to project existing and estimated production and income coefficients to show that the development investment will pay off in financial benefits to project participants.

The problem with these, as well as all other numerical calculations intended to judge projects on their income-producing aspects, is that the unknowns are so gigantic, the discretionary latitude so large, that any project can fit any quantitative target. In short, a series of financial return safeguards that were appropriate for multi-million dollar fertilizer plants operating in the commercial sector are inappropriate when applied to small holder, rural poor benefits. The difficulties of getting benefits to the rural poor overwhelms the capacity of arithmetic computations to project the particular level and type of benefits they will receive.

# INFORMATION STRATEGIES FOR MONITORING AND EVALUATING RURAL DEVELOPMENT PROJECTS

## Introduction

There are several alternatives or combinations of strategies that can satisfy information requirements for monitoring and evaluating rural development projects. These alternatives present themselves as options with decision sets.

The first set of options concerns the definition of information requirements which is in turn a function of the attitude of project management toward the certainty of the benefit linkages within the project. If project management is certain that its preselected development strategy (intervention) will deliver the promised benefits, it will select a monitoring system that carefully tracks the operational performance of the project against the pre-established detailed plan, perhaps with a post-project evaluation. Less certainty will cause the project to look earlier for signs that the benefits are reaching the rural population, with more willingness to adjust/modify the project as it is underway. Finally, uncertainty will call for adaptive field-testing of alternative methods of providing development benefits, with attendant upfront data collection and two-way information flow between monitors/evaluators and project participants. An evolutionary project will call for strong participation of the local target population, with data collection and feedback built

into the project. An experimental (uncertain) evolutionary project will have the highest level of information requirements during implementation.

The second set of options concerns the use of project field staff and management as part of, or all of, the data collection and analysis cadre. There are pros and cons, tradeoffs, which must be understood before a decision is made on who collects and analyzes the data.

The third option set concerns evaluation methodology. Project managers must decide how rigorously they want the tests to measure the change in the benefits received by the target population. They must also decide whether information collection and analysis should be limited to measuring impact or be extended to information that assists in attributing the cause of impact; the latter might include information suggesting modifications in project priorities and operations that could increase performance in the future.

The fourth option set concerns precision in measurement. An example would be the difference between simply counting tin roof additions and the heavy chore of sampling the target population to seek discrete data on income benefits. This leads to an examination of the unit of analysis (community/group or household), data sources, sampling procedures and analysis techniques.

The four option sets are overlaid by two basic data collection and analysis alternatives and two phasing alternatives avail-

able to project managers. The data collection and analysis alternatives are:

- The collection of data to be aggregated and analyzed through statistical/quantitative techniques in order to draw out information; or
- The direct collection of information through the personal synthesis of data bits by information gatherers.

In choosing among phasing alternatives, managers may call for this activity on a regular, continuing basis or after discrete intervals, perhaps twice during a project; or some combination of both as, for example, monitoring on a regular basis with evaluation conducted every two years.

Information Requirements for Monitoring and Evaluating Evolutionary, Experimental Rural Development Projects

In the days before the New Directions Mandate of AID and the focus on the rural poor by the World Bank, a development intervention was selected prior to project implementation and remained largely unchanged throughout the project. Since that time some projects have incorporated flexibility into project implementation with a high level of local participation in the specification of implementation details. Testing in these circumstances may be extended beyond agricultural field trials to other components of a project such as: knowledge communication, local organizational methodology, marketing/storage strategies, nutrition improvements and health care delivery alternatives. There are two

reinforcing thoughts in this evolutionary process of project implementation:

- The involvement of the target population in data collection, analysis and decisionmaking will increase their willingness to participate, take risks leading to modernizing behavior changes; and

- The involvement of the target population supplying feedback information on project impact is a necessary first step in making local adaptations to generalized development plans.

The information requirements for this approach are high and call for regular, positive, two-way information flow between project field staff and project participants. It is a learn-while-doing effort which cannot effectively be contracted out to an academic or data gathering organization.

The establishment and operation of an information system for this kind of project calls for:

- Obtaining information specialist assistance either from the host country or the donor, and using it to help in the earliest days of the project to establish a Data Collection and Analysis Unit that is directly attached to the project management office. This assistance should be short term and advisory, with the responsibility for the actual generation and running of the information system left in the hands of the project staff.

- Utilizing advisory assistance and the project staff assigned to the Data Collection and Analysis Unit to identify all levels of the project in which information is needed for decisionmaking. Project participants should be included as decisionmakers and their information needs should be incorporated into the

system.[1] Design and data collection procedures should make use of the regular interface between staff and participants, with a strong ingredient of participant group dynamics reporting and review. Monitoring and evaluation data requirements should be integrated into regular reporting requirements (work plans, audits, activities, distributions, etc.) so as to minimize extra reporting requirements.

- Making the information collection procedures a standard part of the field staff's assignments. Field staff should involve themselves in local group meetings, and in delivering information to participants.

- Passing up the project ladder, which extends from participants to senior management, only that information which is important for decisionmaking at the next higher level of the project.

There have been a number of projects which have used the methodology defined above. The most complete documentation to date is of the Hanang Village Health Project in Northern Tanzania (Volume Two, pp. 235-281). There are few proven successes although the methodology, much like the development theory on which it is founded, is appealing. Successful implementation obviously demands capable technical assistance and the interest and commitment of project management.

There have been legitimate questions raised over the capability of a project staff to engage in "quasi-experimental" testing, which can have very demanding requirements, to establish con-

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[1] One of the important conclusions of the OECD-sponsored seminar in Paris, March 1978, on information for rural development was the agreement that the information needs of development projects must encompass all decisionmaking levels, to include potential beneficiaries. This is in marked contrast to the emphasis in Management Information Systems (MIS) on information flow only to top-level decisionmakers.

clusively the superiority of one or another development approach.[1] The general outline of the methodology which can be applied in a real-world situation is to be found in Chapter Seven of the *Mandate* report.[2] A more complete handbook on adaptive field-testing in rural development projects is presently being prepared.[3]

## Costs of Information Systems for Monitoring and Evaluation

Evolutionary projects need direct staff involvement in field data collection, interaction with the local population, support to group endeavors including review of development assistance activities, and analysis of the data obtained, with a project office that has direct access to management. Costs for this system are exceedingly hard to estimate, since most of the time and effort is spent by field staff as a normal part of their assigned duties. Estimates of the costs of the Data Collection and Analysis Unit may run from 12 percent (Hanang) of the total management costs to 1.7 percent of total project costs in some World Bank projects (an average $971,000 per project).[4] There are few models to follow, few experts to hire, and far too

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[1] There is no absolute requirement for an evolutionary project to use adaptive field-testing. It is a reflection of the need for local participation to help find the most effective means to development impact. If there are unknowns, as inevitably there are in rural development, some application of a testing methodology can pay high dividends. Thus, the natural but not necessary complements between evolutionary and experimental projects.

[2] *"New Directions" Mandate*, pp. 137-166.

[3] By DAI under contract to the Rural Development and Administration Office of the Development Support Services Bureau of AID.

[4] From an informal paper prepared for the OECD Workshop on Information Systems for Rural Development Projects, Paris, March 20-22, 1978.

imposing lists of "related to" data which might be collected by such a project management information system. Under the next option set, which includes precision in measurement, some of the simplifications which can be adopted for this type of data collection and analysis system are examined.

In addition, even in those instances where project staff involvement is possible, the incentive structure must reward accurate, rather than inflated reporting. In the Masagana 99 program in the Philippines and in the District Development Program in Kenya, appropriate incentives were not established for the data collection assignments; as a consequence cases of inflated, incorrect, or missing data appeared.[1] Thus some data, particularly impact evaluation data, which reflects the responsibility and work of the field staff (such as yield reporting from the extension worker who is responsible for increasing yields), is not appropriate for field staff collection. It is possible, however, for extension staff to report the area planted by variety and cultural practice while yield estimations are obtained from more objective monitors and evaluators. The combination of the two data sets would provide a complete information package on these production variables.

What is involved here is a tradeoff between "objectivity" on the one hand, and "interaction" on the other. Project manage-

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[1] The Bicol, Masagana 99 and District Development Programs are case studies reported in Volume Two, pp. 285-316.

ment must decide whether objectivity is a more or less valuable asset than insider (friendly) recommendations for project modifications. In some projects, a combination of both approaches can pay high dividends -- project staff involvement in fundamental data collection which is not likely to be affected by the internal reward/incentive structure, and outsider data collection and analysis on impact measurement, trouble-shooting and problem solving.

The project staff involvement model has serious limitations if there is no field staff or if there is a staff but it is divided among a half-dozen different line agenices A rural electric cooperative program, for example, has few staff in direct contact with the electric users. Other projects are actually coordinating bodies, such as the Bicol River Basin Development Program in the Philippines. The line agencies retain control of field personnel -- each with their own incentive, promotion and reward structure. In this instance, the ability of the "project" to install a field-level reporting system is weakened. Similar large coordinated but not directed projects have been reported in Nepal and Brazil in which the project staff involvement model is not appropriate.

In these instances there is a need for a separate set of monitors and evaluators -- either attached directly to the project or completely outside the project, serving as contractors for data collection and analysis.

Determining Precision in Measurement

Precision in measurement is expensive. Professional information specialists have what one researcher has termed a "professional imperative" to overdesign, overconceptualize and overspecify data collection and analysis systems for project implementation with the result that too much data, on too many variables not critical to the project are collected with a level of precision far above that necessary for improvement in the ongoing project activities.[1] When project management responds to questions of what information is important, the costs of obtaining and analyzing the data should be an important part of the decisionmaking.

Statistically valid household surveys on either a population or area frame are usually accepted as precise data collection methodologies, and daily input/output recording on farm records require the ultimate in time and attention for making data accurate and complete. In a survey in the Philippines, one researcher was assigned six families to obtain a daily record of expenses, income and labor.[2] In a second study, researchers lived with families for some days collecting labor division and nutrition data.[3] Stopwatch recording of time distribution of

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[1] See Volume Two, Chapter Five.

[2] See Yujiro Hayami, "Anatomy of Peasant Economy," summarized in Volume Two, p. 193.

[3] See the Laguna (Multipurpose) Household case study in Volume Two, pp. 109-117.

farm households was conducted in a third study, with attendant high costs in research time.[1]

The first question which must be addressed to management is whether household data is necessary to show project impact. With a concern for the distribution of development benefits, the income levels of beneficiaries are important. One solution has been to use the community/group, in areas where there is relative homogeneity among the rural poor, as the unit of analysis, with data showing how the community or group is progressing.[2] A further refinement, if there are known income skews, is to utilize the most informed members of the community/group to provide household data on a percentage of the total population of the community/group.[3] Thus a statistic which shows a threefold increase in market sales based upon increased agricultural production, with the increase concentrated in the lowest quartile of the farm population, might be sufficient data to establish both the magnitude and the distribution of development benefit assistance.[4]

The second question, particularly if the decision is made that household/farm data is necessary for the monitoring and

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[1] See the Cropping Systems Program case study in Volume Two, pp. 359-362.

[2] See the Impact Assessment in Thailand case study in Volume Two, pp. 351-353.

[3] See the Impact of Labor-Intensive Feeder Roads in Colombia case study, Volume Two, pp. 363-384.

[4] This was the basis for the Colombia Small Farmer Development Project. This research undertaking was intended to impact on the large Colomiban development programs funded by the World Bank and Canada. See the discussion in *"New Directions" Mandate*, Chapter Four, pp. 87-94.

evaluation methodology, is to determine what level of precision is needed. Evidence of production, health and income increases can be direct or proxy. The farm records approach is direct in that it captures all inputs and outputs from the farm. Other approaches use proxy indicators of increased income (tin roofs and solid wall housing construction in some environments), or of increased agricultural production/productivity (changed cultural practices). The development of indicators is a situation-specific problem which is part of the customizing of any information system to the needs of the project decisionmakers. One way to obtain this data is to begin with a detailed study of identified categorizations -- cropping patterns, soil fertility differences, lowland/highlands, ethnic groups -- from a reconnaissance survey, and conduct micro-studies on the economic/health/income status of the major distinctions within each category. A project might have six observable major categories, and two distinctions (high resource and low resource) within each category. On the basis of 48 observations of those identified as "representative" within the categories, a good understanding of those actions which improve health, agricultural production and income could be obtained. This data from the micro-study could be used to define indicators which would be generally applicable to project participants -- indicators which would not be as precise as a statistical survey, but far easier and cheaper to collect and analyze. Such data would be sufficient, in many cases, to determine where (among which categorization and distinction) the project is being effective, and where it is not.

The major thrust of information research funded over the last seven years has been to examine alternatives to household surveys as the bread-and-butter data collection methodology for rural development.[1] This is simply because surveys, even when done efficiently and correctly, are expensive -- running above $200 per respondent -- time consuming -- from six months to two years -- and not easily interpreted to discover the whys and wherefores that are the underlying explanations of the complex issues of behavior change and modernization in a rural society.[2] And they are very consumptive of expert assistance; those which have been sponsored by AID in Latin America, for example, are high-cost, high-skill labor-intensive operations.[3] For research, sector modeling, census statistics, and national planning such surveys may deliver many valuable outputs. For project implementation there have been few positive results, beyond an occasional one-time measurement of change which is called project

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[1] See Volume Two, Chapter Nine. That the research has proven less than adequate is clear, leaving a good deal more work to be accomplished. This is addressed in a following section.

[2] See the discussion of statistical surveys contained in Volume Two, Chapter Five. Where costs have been available, these are reported, but reflect many local and non-generalizable expenses. When the real costs of professionals needed to clean and interpret economic data are added to the costs of collection, coding, processing and computer time, the numbers are very large. In 1977 the American Technical Assistance Corporation (ATAC) estimated it could obtain and process a standardized small farm survey for $168 per respondent at a sample level of 1,000 with a nine-month turnaround time (Volume Two, pp. 107-108). Costs have undoubtedly gone up, and a $200 per respondent average for a computerized survey would be a useful guideline. For more complex surveys, such as those including nutrition (as in the Laguna Household Survey), or several stages of the determination of income (as in the Bolivia Southern Valleys Survey, Volume Two, pp. 102-105), the costs are much higher.

[3] See the methodology and approach for the sequentially AID-supported rural sector surveys in Colombia, Guatemala and Bolivia, in Volume Two, pp. 99-105.

impact. The existing knowledge base and cost considerations challenge the exclusive reliance on statistical surveys as the major data collection strategy to support decisionmaking in rural development.

The conclusion is that precision in data collection is a decisionmaker's option which can be related to the cost of a project's information system. Considering the professional pride of the information specialist, there are strong reasons for management to emphasize simple, uncomplicated indicators of development assistance which allow for more in-depth probing when problems or high success are uncovered. Indicator systems are less precise and less expensive, but do require upfront study and high-level technical assistance. There is apparently an inverse correlation between the simplicity of an information system and the level of advisory talent needed to design and operationalize the underlying concepts.

## Selecting an Evaluation Methodology

Evaluation methodology is a subject which can consume thousands of pages while resolving little. The important issues for project managers revolve around evaluation methodology options, for the options have very different requirements in human resources and costs.

One evaluation methodology calls for a review of achievements against planned targets. For many reasons, including the

now-recognized fact that targets are often selected for use in advocacy documents meant to influence project reviewers, such targets are not satisfactory as the evaluation standard. Another methodology has been the use of baseline surveys with follow-up measurements of baseline indicators. A third methodology is to measure change retrospectively, after the project is underway, and relate marginal changes to project impact and project beneficiaries.

All of these methodologies assume that any change in the welfare of project beneficiaries is the result of project activities; change under this assumption equals project impact.

There are more powerful methodologies which call for the use of control groups; however, these methodologies have been developed for conditions closer to those of a laboratory and require significant adaptation when applied to a field setting.

While an information specialist may have one "right" way to develop an evaluation methodology, the manager should seek least-cost solutions which are applicable to the decisionmaking needs of the project. This relates to precision in measurement since a baseline survey can easily be conducted with the community/group as the unit of analysis in an expanded reconnaissance survey format. Unfortunately, most decisionmakers equate baseline survey with household survey, with the attendant high costs and long delays. Purists argue that there are many items which cannot be recalled accurately in the "after" phase of a project.

This is true, as is the fact that the input/output data which is used as the basis for rural income calculations also cannot be (or will not be) recalled accurately enough in surveys spanning a cropping cycle to allow a measurement-remeasurement calculation.[1] If income is the important variable in an agricultural community, a regularly obtained record of farm activities is the only proven methodology that generates precise statistics. If a level of income and change in that level are sufficient for project evaluation, then indicators can be developed which are observable or directly obtained from project field staff or non-project data collectors.

Much data is available after project implementation which can be compared with data on conditions before project implementation: data on agricultural techniques, housing materials and investments, surplus food marketed and consumed. If the critical indicators are those which are stamped upon the memories of the rural population and for which there is no incentive for false reporting (which often cripples attempts to obtain income data by interview) marginal changes in the before and after stages can be obtained and used for project evaluation.

Finally, in the shift from surveys which capture perceptions of the population to those which focus on observable behavior, much of the potential of informal yet systematic feedback from

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[1] See Volume Two, pp. 83-92, for an extended discussion of the problems of precision in capturing income data in crop-cycle surveys.

the participants has been lost. One indication of whether the project is actually assisting a rural population is to regularly ask the local leadership -- if representative of the target group -- their opinions on this matter. Deliberately seeking informal leadership views, using a trouble-shooting team for problem solving as well as special studies, will add to the knowledge base of the project and to the data available for evaluation. The difficulties in making the project deliver benefits to the target population should be separated from the problems of proving to a foreign donor that the benefits have been delivered. The evaluation methodology should be good enough to positively affect the former while satisfying the latter. This calls for decisionmaking at the level of the project on the appropriate evaluation methodology, with the knowledge that there are options and tradeoffs, and no "right" way to do the job.

## FURTHER RESEARCH REQUIREMENTS

It is obvious that a great deal is yet to be learned about information for decisionmaking in rural development. A study of what is presently ongoing will uncover, as has this rapid survey, a great deal of dysfunctional and expensive activity, some functional and expensive, little functional and low cost. Thoughtful research on alternative data collection and analysis approaches in the same area would be of major benefit to the development community. The only project which appears to have these features

is the Economic and Social Impact Assessment Project which has recently been authorized for AID-support in the Philippines. The results will not be in until the 1980s.

In the meantime, there is a need to monitor and evaluate the monitoring and evaluation systems in use to determine:

- The relevancy to decisionmaking -- information use by decisionmakers (project participants through project management) -- by level of precision, cost of the collection.
- The comparative costs of alternative data collection techniques;
- The comparative costs of alternative data analysis techniques (and here the minicomputer has revolutionized data processing and should be applicable to large development projects);
- The relationship of data collection and analysis alternatives to the size of the project, the evolutionary nature of the project, functional concentrations and organizational structure; and
- Information use by management.

For comparative case studies, it is critical that agreement be reached on what is to be compared, since data overload can easily result from case studies of data overload. Some interesting work is presently ongoing within development projects, and this should be reported and made a part of the literature on information systems to support rural development.

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