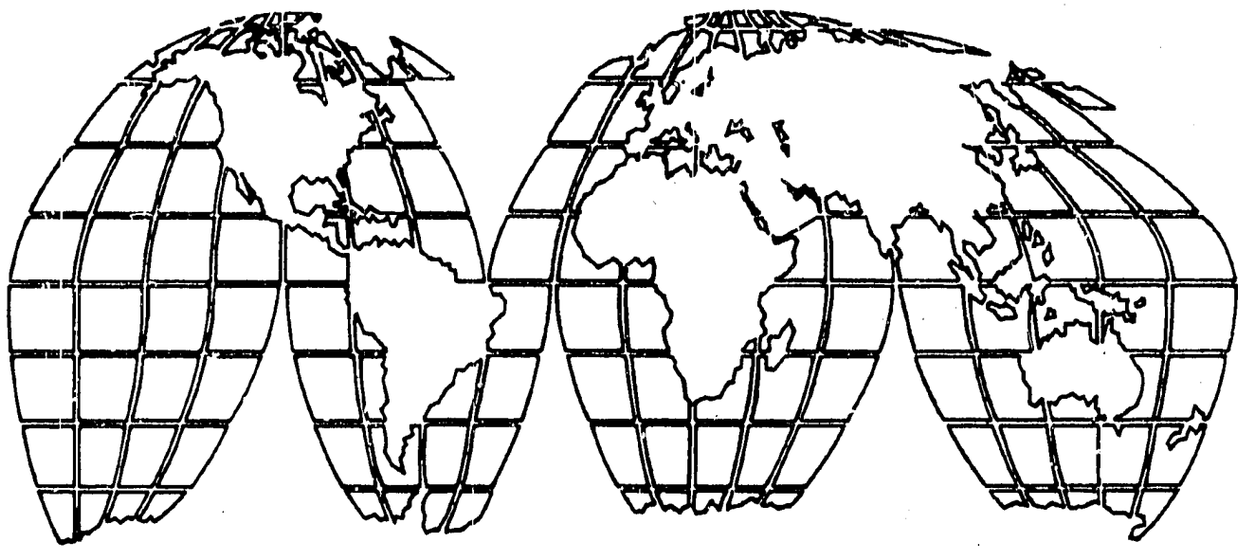
A.I.D. EVALUATION OCCASIONAL PAPER NO. 30

IMPACT INDICATORS: GENERAL ISSUES AND CONCERNS



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IMPACT INDICATORS: GENERAL ISSUES AND CONCERNS

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FOREWORD

The Agency for International Development (A.I.D.), Bureau for Program and Policy Coordination/Center for Development Information and Evaluation (PPC/CDIE), in cooperation with the Bureau for Science and Technology and three regional bureaus, organized a workshop on indicators for measuring changes in income, food consumption and food availability, and the natural resource base. The purpose of the workshop was to identify and discuss a set of simple, practical indicators that can be used by overseas Missions and A.I.D./Washington for monitoring the impact of agricultural and rural development assistance.

The workshop was held on June 20-22, 1988 in Virginia and was attended by 60 development specialists, including A.I.D. staff, consultants, and outside experts. Four background papers written by experts were presented at the workshop; this paper is one of them. The titles of the others are "Indicators of Household Income for Use in the Evaluation of Agricultural Development Projects," "Food Availability and Consumption Indicators," and "Indicators for Assessing Changes in Natural Resources in Developing Countries."

A report by Krishna Kumar, entitled "Indicators for Measuring Change in Income, Food Availability and Consumption, and the National Resource Base," presents the main finding and conclusion of the workshop. In addition, CDIE has issued another paper related to the workshop topic entitled Methodologies for Assessing the Impact of Agricultural Development Projects, A.I.D. Program Design and Evaluation Methodology Report No. 11.

I am confident that these publications will be of great help, not only to A.I.D. staff and contractors, but also to host governments and institutions struggling to develop effective and efficient monitoring and evaluation systems for development activities.

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1. INTRODUCTION

Impact indicators for agricultural and rural development assistance remains a largely unexplored topic in the Agency for International Development (A.I.D.). Considerable confusion, and even skepticism, seems to prevail about the nature, role, advantages, and limitations of impact indicators that assess changes resulting from project and program interactions in the agricultural and rural sectors. This paper attempts to clarify some of the important underlying issues involving impact indicators.

2. CHARACTERISTICS

Despite the widespread use of the term indicator, or perhaps because it is so widely used, considerable ambiguity surrounds its meaning. The term is often used interchangeably with data, targets, standards for evaluation, and even various modes of data collection. Such confusion is unwarranted, because the term has a precise connotation in the literature on monitoring and evaluation of development assistance projects and programs.

Simply stated, indicators are designed to measure change in a given phenomenon or process. They are analytical tools that facilitate the measurement of change and provide summary data for project design, implementation, and evaluation. Indicators may be defined as "specific (explicit) and objectively verifiable measures of changes or results produced by an activity" (United Nations 1985, 37).

Indicators have several characteristics worth mentioning. First, as the definition given above implies, indicators provide quantitative data that can be analyzed using statistical techniques to produce estimates of change in a phenomenon or process. In cases in which only qualitative information is gathered, the information should be converted into numerical data for the purposes of analysis and presentation.

Second, depending on the purpose of the study, indicators can capture one or more dimensions of a phenomenon or process. Investigators can, for example, construct a complex indicator for surface water pollution based on such variables as presence of suspended sediments, toxic chemical concentrations, and nutrient loads, any of which can also be used as a simple indicator of surface water quality. More complex indicators, which focus on several dimensions of a problem, are usually more difficult to construct and may require more elaborate data and information.

Third, several indicators can be used to capture the same phenomenon. For instance, direct indicators of food consumption at the micro level include 7-day recall of food purchases, 24-hour recall of food consumed, 7-day recall of food consumed, and the weight and frequency of cooked food consumed. The availability of many indicators that can measure the same phenomenon poses both challenges and opportunities to evaluators. The choice of an appropriate indicator is dictated by several considerations discussed later in this paper.

Fourth, it is useful to distinguish between direct and indirect (proxy) indicators. Direct indicators involve the direct measurement of a phenomenon; for example, income surveys can be used to obtain direct measures of per capita household income. However, in many cases, the direct measurement of a phenomenon is not possible or cost-effective. For example, income surveys carried out in rural areas often fail to provide reliable data; therefore investigators tend to use household assets, farm holdings, household expenditures, and standard-of-living measurements as proxies for income.

Finally, indicators must use points of reference to determine whether change has occurred, and if so to what extent. Ideally, indicator data should be gathered at several points in time (before, during, and after project implementation) to reveal changes or trends. Depending on the indicator used, repeated data collection at specific intervals or during various seasons may be necessary. For example, rural unemployment assessments should be performed during periods of slack agricultural labor demand to catch the full magnitude of the unemployment problem, or rates of soil erosion should be measured during heavy rainfall periods when soils are most vulnerable to erosion. If time-series data are properly carried out, analyses can yield interesting results. For example, investigators might conclude that the incomes of a certain group of farmers increased by 40 percent during the life of a project, that no measurable change occurred, or that incomes fell by 15 percent.

When time-series data are not available, cross-sectional data can be used to make comparisons. In such situations, the same indicators can be used to gather data for comparable groups or regions. In other situations, acceptable standards or targets can be used to measure progress or lack of it. In any event, the essential point is that indicator data are useful only when baselines, standards, targets, or other reference points against which changes can be examined have already been established.

Indicators are usually classified into three categories, depending on the purpose for which they are used. The first category of indicators is composed of "performance" indicators, which describe the status of a development activity or task. Examples include the amount of fertilizer supplied to farmers,

the number of farmers visited by extension agents, and the number of agriculturalists awarded fellowships to study overseas. Used in A.I.D.'s Logical Framework, performance indicators focus on project outputs. These indicators are extremely useful for systematically monitoring the progress of a project, and inferences about overall impacts can often be made on the basis of these indicators.

The second category comprises "purpose level" indicators (using A.I.D.'s Logical Framework terminology), which measure the direct results of project activities or tasks. Some widely used indicators that fall under this category include agricultural yields, resource productivity, numbers of graduates trained by an agricultural university established with A.I.D. support, and amounts of additional land brought under irrigation.

The last category comprises "impact" indicators, which are designed to measure the effects of development interventions on people, economic sectors, society, and the environment. Such indicators essentially deal with the ultimate goals of development. Examples of impact indicators include per capita income, per capita calories consumed, nutritional status, condition of rangelands, and surface water quality.

It is worthwhile to mention that these three categories often overlap each other. In particular, the dividing line between the second and third categories is often thin. Nevertheless, the distinctions among the three categories are helpful for analytical purposes.

3. IMPACT INDICATORS: SELECTING CRITERIA

Two types of considerations are important when selecting impact indicators. The first is dictated by certain technical requirements, while the second arises from general constraints in which investigators operate. The technical or methodological requirements are listed below.

-- Validity. Indicators should be able to measure what they are intended to measure. For example, if household assets are used as a proxy for income, investigators must be certain that an assessment of assets will yield information on the income level of the area's target population. Validity is a more serious problem when measuring impacts on income and food consumption than when measuring impacts on natural resources.

-- Reliability. Conclusions based on any given indicator should be the same regardless of who completed the assessments, at what time periods, and under what conditions.

-- Sensitivity. Indicators should capture desired changes of interest in a variety of situations. The issue of sensitivity is closely associated with precision.

-- Replicability. Indicators should be reproducible for different projects and settings, so that comparative analysis is made possible. If selected indicators cannot be used over time in different settings, it becomes impossible to aggregate and compare data to arrive at meaningful conclusions.

-- Availability of data. There is little use for indicators requiring data that are unavailable; therefore the data required for an indicator should be easily accessible.

Indicator selection is not dictated by technical criteria alone; practical considerations also impinge on the selection process. Only in an ideal world with unlimited technical and economic resources, abundant time, and no political constraints can selections be made on technical grounds alone. In the real world, A.I.D. staff and contractors must consider the following additional criteria when selecting impact indicators.

-- Cost of data collection. Costs vary for different indicators depending on the magnitude of information required, mode of data collection, and scale of operation. One reason indirect indicators are often used is to reduce cost. For example, anthropometric measures that provide information on a target population's nutritional status are usually preferred over direct household consumption measures because anthropometric measures are relatively cost-effective.

-- Availability of technical and organizational resources. Data that can be collected by local personnel and agencies in developing countries reduce costs and strengthen host country institutional capabilities. Thus indicators based on such data are preferred to other types of indicators.

-- Timeliness of results. The rapid delivery and analysis of indicator data is important for project design and implementation activities. Indicators that meet this criterion can better serve the information needs of project managers and A.I.D.'s central bureaus. In this context, the use of microcomputers and remote-sensing

techniques can sharply reduce the time required for data collection and analysis. As a result of new developments in information processing technology, new indicators can be designed. In fact some indicators that were previously not used are now practical options.

-- Ease of Comprehension. Policymakers and decision-makers lack technical expertise and thus tend to ignore indicators that are expressed in highly complex and technical language. An advantage of using indicators such as per capita income, number of meals consumed per day, the size and weight of children under 3 years of age, food crop yields, and the frequency and extent of damage caused by floods is that these terms have entered the common vocabulary of project and program managers, and a large number of people can interpret the results of assessments based on such indicators.

A final point is that the indicator selection criteria listed above and the considerations discussed are often not mutually compatible, and trade-offs will necessarily occur during the selection process. In practice, reasonable compromises must be made between these sometimes competing requirements. For example, investigators may settle for less validity in order to ensure greater data availability or lower data collection costs. Or they may choose more sensitive indicators even when such indicators require data that take more time to collect and analyze.

4. ESTABLISHING CAUSALITY

Impact indicators should allow investigators to measure the degree and direction of changes resulting from assistance efforts. For instance, on the basis of carefully collected time-series data for a large-scale irrigation project, evaluators should be able to suggest that while the income of targeted farmers has increased 40 percent and nutrition levels (as measured by anthropometric measures) have improved, excessive groundwater withdrawal rates have lowered the water table by 5 feet. However, can investigators who arrive at such findings actually conclude that the observed changes were caused by the project?

Unfortunately, impact indicators alone cannot always establish that the observed changes were caused by a given intervention. Economic, social, and environmental impacts can result from a wide range of factors and circumstances that are completely unrelated to project assistance. Therefore, the mere fact that income has increased or nutrition levels have improved in a project area does not imply that these changes were caused

by a particular project. In many cases, it is possible to draw misleading inferences because nonproject factors, not project activities, were responsible for the observed changes. Returning to the example of the irrigation project discussed above, the government, responding to pressure from international agencies, may have allowed procurement prices for major crops to rise, which, in turn, contributed to increased water demand for irrigation, higher incomes, and improved levels of nutrition. How then can the problem of demonstrating causality be solved?

The conventional methodological solution involves selecting indicators that can measure net impacts, meaning that impacts attributable to external variables that are independent of project activities are subtracted from total impacts. Suppose that a project supplying fertilizers to farmers is evaluated and investigators find that farmer income rose by 45 percent over a specified time period. However, further investigation reveals that factors unrelated to project activities, such as rising prices of major crops, access to improved extension services, and expanding markets, accounted for a 42-percent increase in farm incomes. In such a case, investigators would conclude that the project did not contribute significantly to changes in income. On the other hand, if the data show that factors unrelated to project activities explain only a 17-percent change in income, investigators would conclude that the project was responsible for a significant rise in farmer income.

Experience shows that the two methodological strategies for measuring net impact--quasi-experimental designs and statistical controls, traditionally used in the health, education, and population sectors--have not proven practical for use in agricultural and rural development projects. Both strategies pose major conceptual and methodological problems that are difficult to resolve satisfactorily. Moreover, they require massive and expensive data collection efforts that must be conducted over extended periods of time, a task that public agencies are usually unable to manage, given the various budget and time constraints. Because of these drawbacks, such strategies should not be employed except in the case of a few, innovative pilot projects, where uncertainty about results may justify a large-scale investment of resources.

In our view, the most practical solution to the problems mentioned above is to supplement indicator data with qualitative studies. Although qualitative studies are usually not designed to measure net changes, they can provide a plausible answer to the question of whether a project has contributed to a particular observed outcome. Well-designed qualitative studies can examine the underlying assumptions on which an intervention model is based and their relevance in a given project setting, the effectiveness of activities undertaken to initiate change, and the possible explanations for changes measured by impact

indicators. These studies can also identify unanticipated impacts and shed light on intervening variables that may account for their occurrence.

Several well-established techniques for gathering and analyzing qualitative data include (1) in-depth interviews with experts, government officials, project management staff, target farmers, and local leaders; (2) community and village meetings with target farmers and other beneficiaries to elicit their views, comments, and recommendations; (3) focus group discussions with concerned individuals, such as project staff members, government officials, and project beneficiaries; (4) direct observation by experts who make field visits to observe possible project results; and (5) informal surveys through interviews carried out by evaluators using unstructured interview guidelines. Such well-designed and carefully planned studies require only modest investments of time and personnel to produce useful results.

In conclusion, while impact indicator data are not necessarily sufficient to establish causality between project activities and observed changes, they are essential in determining whether or not changes have occurred and, if they have, how big they may be. However, it is useful to supplement impact indicator analyses with qualitative studies to establish with a reasonable degree of certainty whether project interventions have resulted in specific outcomes.

5. THE RATIONALE FOR FOCUSING ON THREE AREAS OF IMPACT

Since various elements of a society--economic, social, political, and cultural--are interrelated, agricultural interventions tend to have far-reaching effects. Consider, for example, the case of an area development project with multiple components. A successful project may contribute to significant changes not only in the income, employment, and economic status of farming and nonfarming populations, but also in the existing social structures, role of women, educational opportunities, economic stratification, quality of water and soil resources, and even political participation.

Certainly, it is difficult to conceptualize all these potential effects without making many questionable assumptions that link specific activities to specific outcomes. The task of constructing indicators that can assess such a multitude of outcomes is extremely difficult. Even if conceptual and technical problems were to be overcome, such a comprehensive evaluation system would still require a level of resource commitment that could not be justified. Therefore, prudence dictates that

investigators focus on only a narrow set of impact areas for which systematic time-series or cross-sectional data can be collected and analyzed.

Although a number of areas can be identified to assess development assistance impacts, this paper discusses three--household income, food availability and consumption, and the natural resource base--because improvements in these three best represent the ultimate goals of A.I.D.'s development assistance program. Other impacts, such as increased agricultural production, stronger and more viable institutions, and better diffusion of appropriate technologies, are not ends in themselves; rather, they are the means to achieving goals more closely associated with alleviating humankind's age-old problems of poverty and deprivation.

A growth in income is undoubtedly recognized as the primary objective of development efforts sponsored by international agencies. Although there is legitimate concern about the problem of economic inequality, all experts agree that development assistance must contribute to a process of sustainable, rapid economic growth that results in a broad-based rise in income.

Moreover, past experience shows that in the long run, increasing income at the local level is closely associated with greater food availability, improved nutrition, better quality of shelter, greater educational opportunities, declining mortality and illiteracy rates, and more viable cultural institutions. Therefore, income level is usually a good predictor of improvement in the quality of life of individuals.

This paper focuses on food availability and consumption to underscore the point that the ultimate objective of A.I.D.'s efforts in developing countries goes beyond obtaining increases in agricultural production to contributing to ending hunger and malnutrition. The concept of food availability includes past stocks, current levels of food production, and imports available for consumption. Thus, availability and consumption is an area that encompasses the whole range of food and agricultural sector development issues.

Food availability and consumption are closely related, although greater food supply is not always translated into increased food consumption. In many parts of the world, particularly Sub-Saharan Africa, food security is the primary concern for national governments and international donor agencies. In such instances, a focus on food availability and consumption is still more relevant.

Finally, the need to maintain and enhance the natural resource base has recently emerged as one of the Agency's major goals. Achieving short-term increases in agricultural production

and income at the cost of long-term, irreparable harm to natural resources cannot be justified. Agricultural projects can accelerate the process of degradation of soils, water, plants, and wildlife habitats in a variety of ways. Improper farming practices can lead to soil erosion by wind or water. Excessive use of pesticides can pollute surface water and ground water. Expanding populations who depend on wood for fuel and shelter and public agencies that encourage greater livestock production create stress on forests and rangelands, which may ultimately lead to deforestation and desertification. However, projects that encourage improved natural resource management and appropriate land-use schemes can have positive impacts on the existing natural resource base.

Two additional arguments in support of selecting these three areas should be mentioned. First, appropriate indicators for measuring changes in all three areas already exist or can be easily developed. For example, income is a widely used indicator, and macro-level data are easily available on most countries, although questions persist about the quality and reliability of the data. More recently, many host countries and international donor agencies have begun to collect household income data and develop cost-effective data collection methodologies for generating data. In recent years, significant progress has been made in constructing viable indicators for assessing food availability and consumption at the macro and micro levels. A number of indicators for measuring changes in the natural resource base also exist. Recent developments in remote-sensing technologies are expanding the possibilities for assessing changes in the natural resource base, technologies that can be carried out quickly and at relatively modest costs.

Second, the demand from outside interest groups and political constituencies for impact data in all three areas is growing. The U.S. Congress is increasingly demanding more quantitative assessments that clarify A.I.D.'s impact in these three areas, as is made evident by the proposed Hyde Amendment to the Foreign Assistance Act and the Global Poverty Reduction Act. Various U.S. voluntary agencies and special interest and religious groups are seeking more information about the effect of A.I.D. programs on food production and consumption, nutrition status, and the environment.

6. THE NEED TO FOCUS ON FEW PROJECTS

In summary, assessments of household income, food availability and consumption, and the natural resource base are critical for impact analysis. Impact indicators can provide investigators with a systematic basis for assessing the Agency's progress toward its ultimate objectives. It is important to

note that after long deliberations, the Agricultural Sector Council came to the same conclusion and issued the following statement: "The focus of the Agency's agricultural, rural development, and nutrition program is to increase the incomes of the poor majority and expand the availability and consumption of food, while maintaining and enhancing the natural resource base."

It is both unrealistic and unnecessary to focus on gathering data on impact indicators for all or even a majority of projects in the agricultural and rural sectors. It is unrealistic because the level of effort required to collect data will impose administrative, technical, and financial burdens that A.I.D. Missions, even with the support of regional bureaus, are unable to manage without causing major interruptions to other routine activities. Missions may even end up using as many resources on data-collection efforts as on the management of projects themselves. Any such requirement imposed by the Agency will be a prescription for disaster. The experience of all major international agencies clearly demonstrates that such ambitious undertakings have failed in the past, and there is no reason to believe that the past will not repeat itself.

Such efforts are unnecessary because evaluators can, on the basis of a carefully selected sample of projects, certainly make viable generalizations about the overall impacts of the Agency's assistance efforts on household income, food availability and consumption, and natural resources. In fact, inferences drawn from a carefully selected sample may be more valid than those based on measurements of all projects, because the potential for error is reduced.

The Agency should gather data on impact indicators for only a small proportion of its projects, perhaps 10 percent. Several considerations, in addition to various sampling requirements, should be kept in mind. The set of projects selected should reflect the programmatic thrust of A.I.D.'s assistance. Moreover, only those projects should be included that are designed to affect one or more of the three areas mentioned earlier. It is also important to consider the different social, economic, political, and environmental settings in which the selected projects operate. Finally, the capabilities of host country agencies to collect and analyze information should also be considered. In any case, careful identification of projects is necessary to arrive at valid generalizations.

A concern that has been expressed about using a small sample of projects is that all managers, and not a select few, need to know whether their projects have produced or are likely to produce the desired impacts. Although this concern is genuine, it is imperative to recognize that lack of specific impact indicator data does not mean that managers do not have a reasonable indication of the effects of their projects. In most

instances, project managers are well informed about immediate impacts and are able to make reasonable predictions about the long-term impacts of their projects. Project managers form their assessments on the basis of their own intimate knowledge of a project and its setting, information provided by formal and informal sources, and their expertise in the field. Often, though not always, such assessments are sufficient to make a variety of critical decisions at the project level.

Nonetheless, the Agency needs to gather and analyze data on selected impact indicators systematically and impartially. It also needs to maintain an information system on such indicators, because formal and informal assessments made by project managers are insufficient to evaluate the overall impact of A.I.D.'s assistance program. Such assessments tend to be anecdotal and are not usually quantified, aggregated, and presented systematically. Moreover, because they come from project managers, they tend to be highly subjective, and thus, even when accurate, have little credibility.

7. THE COSTS OF ESTABLISHING AN INFORMATION SYSTEM

Building an information system for collecting and analyzing data on impact indicators requires developing appropriate survey instruments for data collection, stationing field investigators at project sites, strengthening the research capabilities of Missions and host government agencies, making collaborative arrangements with research institutions in the United States and abroad, and establishing an evaluation unit at the central Agency level. These activities cannot be undertaken without significant investment of time, money, and technical resources. However, the cost of such a system can be reduced, making it more acceptable financially if several steps are taken.

-- Select only a small sample of agricultural and rural development projects. For each selected project, a monitoring and evaluation unit should be established to systematically gather data on impact indicators and conduct qualitative studies. Such units should be described in Project Papers, and a work plan should specify that they become operational at an early stage of project implementation.

-- Focus on impacts involving income, food availability and consumption, and the natural resource base. The Agency should focus only on those core impact areas that are deemed most important and represent the essential thrust of its assistance to the agricultural and rural sectors. The three areas identified in this

paper would seem to be most suitable for this purpose; however, this is a decision that must be taken at the highest level.

-- Select a minimum number of indicators. The number of indicators in each area mentioned should be kept to a minimum, taking into consideration both technical and practical criteria mentioned early in this paper. However, if Missions or projects need additional data on indicators to meet their particular requirements, they should be free to add to this list of core indicators.

-- Keep the sample size to a minimum. The sample size for each project should be kept small. When sample surveys are required, the sample size should not exceed 150 to 200 cases. Experience shows that a sample of this size is adequate to obtain estimates for food production and consumption, as well as income. Therefore the natural impulse to launch large-scale surveys should be curbed. In fact, small sample size usually improves the quality of data collected by reducing nonsampling errors. It should be recognized that the main threat to validity in survey research in developing countries is not from sampling but nonsampling errors. Small sample-size surveys are more efficient and cost-effective. However, small sample-size surveys may not prove to be the best course of action for data collection on natural resource impacts. In some cases, national level efforts to collect data using remote-sensing technologies supported by on-site surveys and verification will be more meaningful and cost-effective in the long run.

-- Improve donor coordination. Data collection and analysis efforts should be coordinated with other international donor agencies. Although achieving this objective is often easier said than done, there is great potential for coordinating efforts in collecting baseline information on natural resources, strengthening institutional capabilities for daca collection and research at the national level, and training, monitoring, and evaluating staff at the project level.

-- Encourage collaboration efforts with host country institutions. Collaborative arrangements should be made with teaching and research institutions in developing countries to assist with the collection and analysis of data. The experience of many donor agencies on the success of such arrangements is mixed. Unless sustained technical assistance and supervision are provided, local institutions fail to generate timely and reliable information. Furthermore, a host

of political and institutional factors often keep host government agencies from performing properly. A solution to such constraints is to encourage collaborative relationships between the U.S. consulting firms and universities and their counterparts for specific projects.

-- Use innovative and low-cost data collection methods. In recent years, a number of low-cost data-collection approaches have been suggested that can generate both qualitative and quantitative information. These methods can be profitably used for gathering data for relevant indicators. Moreover, secondary data--data originally gathered for other purposes--should be used wherever possible. Investigators are often surprised and even overwhelmed by the vast quantities of information that are routinely gathered in many developing countries. An information system on impact indicators can draw on some of this previously collected information.

BIBLIOGRAPHY

Casley, Dennis J., and Krishna Kumar. 1987. Project Monitoring and Evaluation in Agriculture. Baltimore, Maryland: Johns Hopkins University Press.

Casley, Dennis J., and Krishna Kumar. 1988. The Collection, Analysis, and Use of Monitoring and Evaluation Data. Baltimore, Maryland: Johns Hopkins University Press.

Kumar, Krishna. 1988. Assessing the Impact of Agricultural and Rural Development Assistance. Background Paper for a Workshop on Impact Assessment of Agricultural and Rural Development Assistance. Washington, D.C.: Agency for International Development.

Management Systems International. 1988. "Current Practice and Immediate Needs for Collection and Presentation of Performance and Impact Data." Washington, D.C.: Office of Program and Policy Evaluation, Center for Development Information and Evaluation, Bureau for Program and Policy Coordination, Agency for International Development, Washington, D.C.

United Nations. 1985. Monitoring and Evaluation: Guiding Principles. United Nations ACC Task Force on Rural Development. Rome: International Fund for Agricultural Development.