GUIDELINES FOR MONITORING AND EVALUATION OF RURAL DEVELOPMENT PROJECTS

by

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A fundamental issue facing most practitioners and policymakers concerned with rural development, is the need for prompt feedback of experiences gathered during implementation of projects and programs addressing directly the problems of the rural poor. Monitoring and evaluation are mechanisms that provide project/program managers, policymakers and donor agencies with information on the extent to which the objectives of a project are met, or progress towards meeting them is made. Monitoring and evaluation systems are essential for effective implementation. They are the principal sources of information for the improvement of our knowledge and understanding of rural development.

This paper (i) attempts to create a common understanding of the difficult issues involved in setting up monitoring and evaluation systems; (ii) provides pragmatic guidelines to field planners and managers for thinking through these issues, and resolving them in any particular situation; and (iii) contributes, indirectly, to more effective information and management systems for planning and implementation of rural development projects.
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2: Project Design Summary and Evaluation Frameworks

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SUMMARY

1. A fundamental issue facing most practitioners and policymakers concerned with rural development is the need for prompt feedback of experiences gathered during implementation of projects or programs addressing directly the problems of the rural poor. Research projects and ex-post evaluations, while valuable in their own right, generally do not serve this specific function because they tend to be late in providing results, and often are of a one-shot nature.

2. The inclusion of monitoring and on-going evaluation systems in field projects and programs may help to provide management at all levels with systematic and continuing information on actual progress. Monitoring and on-going evaluation can thus serve several purposes:
   
   i) as a practical tool for better field level management;
   
   ii) as an input to planning and decision-making at various levels;
   
   iii) as a means for improving research and ex-post evaluations; and
   
   iv) as a source of information for training of farmers and community development workers through extension or other services.

3. Most rural development projects now include monitoring and evaluation. At least 75% of all agricultural and rural development projects financed by the World Bank over the last couple of years, made provisions for monitoring and evaluation.

4. In light of the growing importance of monitoring and evaluation for rural development projects, concepts, policies, and procedures need to be further developed.

5. For this purpose, a review was first made of monitoring and evaluation experiences from several rural development projects. The result of this review is a collection of case studies of monitoring and on-going evaluation systems. Secondly, experiences gained in various agencies, especially with the use of monitoring and evaluation frameworks, were studied and adapted. Finally, thirty field practitioners and technical experts from various multilateral and bilateral agencies, were consulted through an interagency workshop on "Monitoring and On-going Evaluation of Rural Development Projects", organized by the World Bank from December 6 to 10, 1976 in Copenhagen.


6. The result from all this are guidelines for monitoring and on-going evaluation of rural development projects and programs. Part I of these guidelines starts by defining monitoring, on-going and ex-post evaluation as follows:

- **Monitoring** is the timely gathering and comparison of information on actual inputs, activities and outputs with the original plan, to warn program/project management about potential implementation problems requiring corrective actions. Monitoring also requires gathering of information on critical assumptions and/or complementary activities essential for the success of a project or program.

- **On-going Evaluation** is an analysis during project implementation of project outputs and effects. The purpose of on-going evaluation is to provide project management and policymakers information on a continuing basis, to enable them to assess, and if necessary, adjust policies, objectives, institutional arrangements and resources affecting the project during implementation.

- **Ex-post evaluation** is an analysis after project completion of the project effects and impact. The purpose of ex-post evaluation is to provide policymakers information for future planning of projects/programs.

7. Part II contains guidelines for design of monitoring and on-going evaluation systems. Section A describes these systems as an integral part of planning and implementation. Considering the uncertainty under which most poverty-oriented rural development projects are designed, it is extremely important that monitoring and evaluation systems are designed as an integral part of project preparation. Furthermore, flexibility in project design is required, so that through continuous (re)planning, on the basis of information on results, constraints, and conditions affecting progress, effective project implementation can be achieved.

8. The design of a monitoring and on-going evaluation system can be simplified if the objectives and assumptions of a project or program can be structured along various levels. A simple format for synthesizing project objectives and assumptions in this way is shown in Section B. The synthesis of project objectives and assumptions into a monitoring and evaluation framework sets the stage for determining and validating whether or not the project outputs are being produced; whether these outputs are producing the intended effects; and whether these effects are making a contribution to the planned ultimate project impact. A monitoring and evaluation framework is not only a useful project planning device, but also allows continuous re-examination of the original design.

9. Issues that need to be considered in detailed design of monitoring and on-going evaluation systems are outlined in Section C. The most important points raised are:
The purposes, functions and users of monitoring, on-going, and ex-post evaluation systems should be clearly identified;

Human, financial, and other constraints should be taken into account in design of monitoring and evaluation systems;

The absolute minimum information should be collected to provide quick feedback to project management and/or policymakers;

Simple analytical procedures need to be adopted and appropriate equipment for information processing and analysis should be selected;

Effective communication of monitoring and evaluation results, through two-way reporting systems between farmers, field workers, project management and higher level decision-makers, is important; and

Monitoring and on-going evaluation should functionally and organizationally be located as close as possible to decision-making; feedback loops should be as short as possible.

These guidelines are primarily intended for: i) field project/program managers; ii) national staff responsible for design of monitoring and evaluation systems; and iii) those in technical and lending agencies who provide assistance on monitoring and evaluation to field project/program managers and national staff. In almost all instances, intelligent use of these guidelines will require creative adaptation to the needs, size and composition of any particular rural development project or program. Some of the principles outlined in this paper might be adaptable to other types of projects. Use of these guidelines for rural development projects of any other international or bilateral agency will most likely require adjustments in terminology, scope and sophistication.
I. INTRODUCTION

A. Rural Development

1.01 Rural development is a strategy to alleviate poverty through sustained increases in the productivity and income of a specific group of people -- the rural poor. The operational objectives of rural development include improved productivity, and thus higher incomes, as well as minimum acceptable levels of food, shelter, education and health services for a target group.

1.02 Target groups are best defined in the context of an individual country. A basic standard for identifying poverty target groups would, however, be absolute or relative poverty. Absolute poverty are income levels below which even minimum standards of nutrition, shelter, and personal amenities cannot be maintained. Relative poverty, that is an income equal to or less than one-third the national average, would be an appropriate additional criterion, because it reflects extreme differences in levels of living between the top and bottom strata of society.

1.03 Rural Development Projects are those where at least the majority of all benefits accrue to absolute or relative poverty target groups. Furthermore, they may strive to:

i) benefit directly large numbers of rural poor;

ii) take a comprehensive approach to small-scale agriculture, and may include components that are indirectly, as well as directly, productive; and

iii) have a sufficiently low cost per beneficiary so that they may be extended or replicated over broader areas.

1/ Definitions in this section have been extracted from the Rural Development Policy Paper (1975) of the World Bank. The same definitions are used in Obaidullah Khan and T. Hensler's report on poverty-oriented rural development and the UN system: "A Turning Point" (February 1976), recommendations of which have been accepted by ACC of the UN. More elaborate discussion of the concept of rural development can be found in Uma Lela's "Design of Rural Development: Lessons from Africa", John Hopkins Press, Washington, D.C., 1975, pp. 19-21.

2/ In this paper the terms "projects" and "programs" will be used interchangeably. If a distinction is required, however, a "project" is generally understood to mean a well-defined set of activities with precise objectives and targets to judge performance, that can be executed in a limited time period. A program is generally understood to mean a sequence of projects over time and/or space required for the implementation of a development strategy.
Poverty-oriented rural development projects are by nature difficult to prepare, appraise and implement. Ambiguities and uncertainties increase when important economic and social objectives are expected to cover large numbers of rural poor. Given that a complete set of necessary and sufficient conditions relevant to a project cannot be specified at the time of preparation and appraisal, mechanisms must be included to control progress made and learn from experience. It is therefore essential that a degree of flexibility be built into projects so that modifications can be made as experience is gained, and that evaluation systems be devised in order to (a) control and monitor the extent of deviations from expectations and (b) learn the lessons of experience. In the following sections, control mechanisms, such as accounting, auditing and reporting, are defined and a distinction is made between monitoring, on-going and ex-post evaluation.

B. Accounting, Auditing and Reporting

1.05 Accounting is part of the broader management system required for project implementation. The function of accounting is to maintain and close periodically in conformity with internationally accepted standards, financial records, including balance sheets, profit and loss statements. The most common difficulty with accounting, particularly for governmental or semi-governmental agencies, is its failure to provide sufficient detail to ascertain where individual items of expenditure have been made. For the purpose of cost accounting, such refinement is, of course, necessary. Thus, in projects that generate revenues, cost accounts are equally important as income accounts, and should be refined sufficiently to permit proper cost accounting analysis.

1.06 Auditing is the periodic review and verification of accounting by qualified, objective, officially designated accounting specialists. Often auditing is limited to the accounting records without sufficient inspection of inventories and verification of the accuracy of accounts receivable and payable, as required by international standards.

1.07 Reporting is the continuous information flow on fiscal and physical progress of project implementation. Internal reporting is the information flow from the lower echelons to project management. External reporting is the information flow from project management to executive agencies (regional, national and/or foreign agencies). In general, a project reporting system should produce information on inputs, activities (their actual starting date, duration and completion, as compared with the planned schedule) and outputs. Reporting should be comprehensive, covering all the project activities and the entire project area. Most of the information produced for reporting will be quantitative; however, reports often do show some qualitative analysis. The major shortcoming of most project reports is their insufficient information on the project results, and inadequate analysis of the relationships between results and inputs.

C. Monitoring

1.08 The terms monitoring and evaluation have been used rather loosely to refer to a spectrum of related but different activities. Conceptual differentiation between monitoring and evaluation is further complicated by
the fact that both terms can be applied to the use made of financial or manpower resources by international or bilateral agencies. Application of monitoring and evaluation by international and bilateral agencies, for the purpose of control and assessment of the impact of their own resources, can best be qualified as "internal" monitoring and evaluation. On the other hand, systems used by project/program managers to control and assess results of projects/programs that might be implemented with resources from various agencies, including international or bilateral aid agencies, can be qualified as "project or program specific" monitoring and evaluation. Obviously, improved design and implementation of project specific monitoring and evaluation will contribute to increasing the effectiveness of internal monitoring and evaluation systems of international or bilateral agencies. Our major concern here, however, is to define "project specific" monitoring and evaluation. First, what is monitoring?

1.09 Monitoring is the timely gathering of information on actual inputs, activities and outputs, and their comparison with the original plan, to warn project/program management about potential implementation problems requiring corrective action. Monitoring requires also gathering of information on critical assumptions and/or complementary activities, essential for the success of the project.

1.10 This definition emphasizes how monitoring results should feed into project management's decision-making. Obviously, in the context of rural development, "project management" can take different shapes. On the one hand, it could mean a new additional organizational entity that alone is responsible for achieving the objectives and undertaking all implementation activities. On the other hand, the project might solely utilize existing organizational structure of one or more institutions. Who ever is responsible for the achievement of the objectives and the implementation of activities, a mechanism will be required for control of sound progress. Such a mechanism, at what ever level of sophistication it is developed, is a monitoring system. An effective monitoring system will provide quick feedback of information to "management", which might be a shared responsibility between a village leader, a local, district, regional and/or national manager. 1/

1/ Reporting and monitoring overlap extensively. Monitoring relies partially on the information produced by internal project reports. Monitoring often requires, however, the generation of additional project related information, especially information focused on critical implementation issues and complementary activities that are essential to the success of the project. The results from monitoring should be reflected in project management's external reports to executive agencies. Although monitoring and reporting overlap extensively, the former involves more than the recording of actual inputs, activities and outputs. Comparisons between actual and planned estimates need to be analyzed, implementation problems diagnosed and additional information gathered through field visits, or discussions with project staff. Early warning of project management and the recommendation of corrective actions to be taken by project management are crucial for effective monitoring.
D. **On-going and Ex-post Evaluation**

1.11 Evaluation is the analysis of project results in order to assess the extent to which the objectives of a project have been realized. This definition emphasizes how evaluation results should feed into planning and decision-making about future rural development projects or programs.

1.12 To assess the extent to which the objectives of a rural development project have been realized, information on (i) project outputs, (ii) effects, and (iii) impact need to be collected and analyzed.

1.13 **Project Outputs** are the (physical) outcome of project activities. Examples of outputs of a rural development project are acreages irrigated, farmers trained, cooperatives established, credit provided, kilometers of roads constructed, health facilities constructed, schools constructed, etc.

1.14 **Project Effects** are the outcome of increased use made of project outputs. Examples of the effects of a rural development project are increased production, higher crop yields, increased employment, more traffic, increased use of health services, higher attendance at schools, etc.

1.15 **Project Impact** is the change in the standard of living or the increased capacity for self-sustained development of a group of beneficiaries or communities, resulting from project effects. These changes can be measured by increased income and consumption, improved diets, reduced incidence of diseases, increased literacy, increased local participation in planning and decision-making, etc.

1.16 The distinction between project outputs, effects, and impact permits structuring of the objectives of a rural development project along various levels — i.e. a hierarchy of objectives — so that their relationship to project inputs and their interdependency become clear. For example, irrigation systems, extension services, better seeds and fertilizers are all inputs that increase the productivity of small farmers. The immediate outputs from a rural development project with such objectives would be irrigated areas, trained farmers, increased use of better seeds and fertilizers by farmers. The effects are increased agricultural production and possibly higher income for small farmers. The latter, obviously, depends on numerous conditions regarding farmers' access to markets, the market structure, the price policies, and possibly even the export potential. Higher incomes of small farmers contribute to raising the standard of living in rural areas, the expected ultimate project impact. Structuring of the objectives of a rural development project along various levels, i.e. constructing a "hierarchy of objectives" will simplify the design of a monitoring and evaluation system. (See Part II, Section B).

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1/ Evaluation should not be confused with an analysis of the merits of a project proposed for financing. Such an analysis is generally referred to as "project appraisal". In other words, appraisal means assessment before a project is approved, while evaluation is used for assessment after a project is approved.
Evaluation can be done continuously during project implementation, that is, "on-going evaluation", or can be done at one or more points in time after completion of project implementation, that is, "ex-post evaluation(s)".

On-going Evaluation is an analysis during implementation of project outputs, effects and (potential) impact of a project. The purpose of on-going evaluation is to provide project management and policymakers information on a continuing basis, to enable them to assess, and if necessary, adjust policies, objectives, institutional arrangements and resources affecting the project during implementation.

Ex-post Evaluation is an analysis after project completion of the project effects and impact. The purpose of ex-post evaluation is to provide policymakers information for future planning of projects/programs.

Both on-going and ex-post evaluation rely extensively on accounting, auditing, reporting and monitoring. In almost all cases, however, evaluation will require additional information, especially non-project related information on control areas, other development projects, sector trends, etc. Furthermore, the information required for evaluation should cover the entire project area and all project components; it will not be focused on critical implementation issues.

In summary, monitoring and evaluation systems are of great value for effective implementation of any project. They are of even greater importance for rural development projects because such projects are more complex and usually have a multitude of objectives that need to be achieved. The major purposes of monitoring and evaluation are to ensure that objectives are met, or progress towards meeting them, is made. Monitoring and evaluation are mechanisms by which readily digestible information on inputs, activities, outputs, effects and likely impact of projects is made available to project managers, policymakers and donor agencies. In addition, monitoring and evaluation systems can serve several other purposes. Firstly, through systematic accumulation of experiences, it provides a basis for future project design and for clearer articulation of objectives. Secondly, they can be used as a mechanism for training of project management. Thirdly, they can serve a valuable research purpose; namely, for the study of the process of rural development.
II. DESIGN OF MONITORING AND ON-GOING EVALUATION SYSTEMS

2.01 Approaches to monitoring and on-going evaluation need to be considered as early as possible in project preparation or planning (section A). Structuring of project objectives, targets, and critical assumptions of a project into a four by four matrix or table will considerably simplify the design of monitoring and evaluation systems (section B). Detailed design of low cost monitoring and on-going evaluation systems then require a definition of purposes, functions and users of those systems; the identification of constraints, information requirements and key indicators; the selection of information collection and analysis techniques; the design of feedback or reporting systems, etc. Each of these issues will be discussed in section C.

A. Monitoring and Evaluation Systems: Part of Project Preparation

2.02 Considering the uncertainty under which most poverty-oriented rural development projects are designed, it is extremely important that monitoring and evaluation are included as an integral part of project preparation. The need for flexibility in project design, that is for continuous (re)planning, especially of poverty-oriented rural development projects, will require a continuous flow of information on constraints and conditions affecting project progress. A first element in a continuous participatory planning process would be base-line studies.

2.03 Base-line studies may involve surveys of project area, identification of needs and constraints, and generally an assessment of social and economic living conditions in an area. These studies establish norms for subsequent assessments of project progress. They also identify the constraints that need to be overcome, and conditions that need to be taken into account during project preparation.
Consideration of monitoring and evaluation during project preparation may influence how objectives of a rural development project are formulated. Clear specification of causal linkages between objectives, with timeframes and hypothesized means-end linkages for their achievement, will greatly facilitate monitoring, and through it evaluation.

The design of a project organization and management system might likewise be influenced by the feasibility of simple low-cost approach to monitoring. If no simple approach to monitoring can be found for a given project management system, it will be difficult to control progress under implementation, and thus to "manage" the project. In these circumstances, serious thought should be given to simplification of the project management system rather than experiment with impossible control systems during implementation.

B. Synthesis of Project Objectives, Targets and Assumptions into a Monitoring and Evaluation Framework

In order to simplify the design of monitoring and evaluation systems, the objectives, targets and assumptions of a project should be synthesized in a four by four matrix (see Table 1). The following steps facilitate the construction of such a basic framework for design of a monitoring and evaluation system:

i) define a causal hierarchy of project inputs, outputs, effects and impact; and hypothesize means-end linkages between them (column 1);

ii) select indicators that will permit subsequent measurement of verification of the defined outputs, effects and impact (column 2);

iii) articulate the assumptions about external influences and factors that will influence the causal linkages -- that is, those which must be assumed to exist or be brought about if the project is to succeed, but over which project management has little or no control (column 4); and

iv) design monitoring and evaluation system for verification of all of the above (column 3).

A monitoring and evaluation framework as shown in Table 1 can adopt various terminology (instead of project outputs, effects and impact, one could simply number the levels of objectives). In other words, the terminology might be adapted according to the one most easily useable by project management. Such a framework is a tool for structuring
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objectives logically at different levels, for selecting objectively verifiable indicators, and for identifying critical assumptions for the success of the project. A monitoring and evaluation framework sets the stage for detailed design of those systems.

2.08 Two illustrations of monitoring and evaluation frameworks can be found in Annex 2. As can be seen from these illustrations, complex rural development projects with many components may require a series of frameworks, where each of them represents a particular component, or management "center" that needs monitoring and evaluation.

2.09 The synthesis of project objectives, targets and assumptions into a framework sets the stage for determining and validating whether or not the project outputs are being produced; whether these outputs in fact are producing the intended effects; and, finally, whether these effects are making a contribution to the planned ultimate project impact. It is not only a useful project planning device, but also permits continuous re-examination of the original design. For this purpose the above framework could be extended with several columns (or overleaf sheets could be used) to record during project implementation the actual values obtained on the indicators. A comparison of actual with the originally planned targets would then allow to make changes in the original objectives. Similarly, an additional column for the verification of the assumptions, might allow for the verification of the conditions governing the success of the project.

In this way, the framework loses its static nature and actually becomes a dynamic tool for continuous monitoring and on-going evaluation of project progress.

C. Detailed Design of a Monitoring and On-going Evaluation System

2.10 One of the problems with many monitoring and evaluation systems is that they are often designed without specific purposes, a detailed costing or even regard to the scarcity of qualified manpower. In order to design monitoring and on-going evaluation systems, the following questions at least need to be considered:

i) What are the purposes, functions and who are the users of monitoring, on-going and ex-post evaluation?

ii) What are the constraints to be considered in setting up monitoring and evaluation systems?

iii) What information is required and which indicators should be used?

iv) How should information be collected and analyzed?

v) How should the results be reported or fed back?

vi) How should monitoring and on-going evaluation be organized?
vii) How much should be invested into such systems?

These questions will be a lot simpler to answer if project objectives, targets, and assumptions are clearly spelled out in a monitoring and evaluation framework. Using such a framework as a basic tool, detailed design of both a monitoring and on-going evaluation system can then proceed.

1. What are the purposes, functions and who are the users of monitoring, on-going and ex-post evaluation?

2.11 Project management can use monitoring to keep abreast of project operations and to suggest those changes in design and implementation which are shown to be necessary to achieve project objectives. The monitoring system can be merely the watchful eyes of knowledgeable specialists who, through their own observation, check and report on progress and time phasing in the project. On the other hand, the monitoring system can be sophisticated, with regular information collection to measure specific targets against actual performance (e.g., delivery of inputs, recruitment of personnel, construction work undertaken, training of extensionists, etc.). The latter system requires considerable recorded detail to monitor the project; the former relies on individuals to make subjective judgments, assimilate details and produce an overall assessment. A choice will need to be made about the mix of subjective and objective information requirements, and thus about the level of sophistication of the monitoring system. This will, obviously, depend on the existing constraints, both in terms of available qualified manpower and the information absorption capacity of project management. (See following section)

2.12 Both project management, planners and decision-makers at higher levels might use on-going evaluation for the purpose of assessing the effects of the project on the target population long before it is possible to conduct a full-scale evaluation of project impact. Nearly every rural development project calls for some behavioral change by the population to be assisted by the project. This may be in land preparation, seed selection, weeding spacing, fertilizer applications, insecticides, harvesting techniques, etc. While an ex-post evaluation will be concerned with the income changes as a result of these activities, on-going evaluation might be concerned with who is and who is not adopting the recommended procedures deemed necessary to achieve the benefits of the new agricultural technology. From discussion with and observation of those who adopt or partially adopt and those who do not, it will be possible to learn how the project might be improved, long before the results of the first year's crop cycle are recorded. On-going evaluation should provide immediate feedback to project management and higher level decision-makers so that modifications can be made in project design during project operation.

2.13 Ex-post evaluation should mainly be oriented to assessing development concepts and strategies of the project for overall policy planning or replanning. For some projects there may be a time lag between termination of final disbursements for project operations, and the time when the desired effect and impact of the project (the focus of the evaluation) can be measured. On-going evaluation may therefore be even more important than ex-post evaluation.
Both on-going and ex-post evaluation will test the linkages between project inputs, outputs, effect and impact. The level of success or failure will be measured, but more important, the causes of success or failure will be examined (the diagnostic component of evaluation). The evaluation should point the way in which perceived problems can be eliminated or at least ameliorated (the prescriptive component) and should offer a history so that successful concepts and strategies can be replicated and mistakes avoided in future efforts (the replicative component).

The purposes of monitoring, on-going and ex-post evaluation should be closely related to the project objectives and general description of project components. The objectives of rural development projects are diverse and their specificity in project documents extremely varied. Some project proposals list as objectives a series of activities without specifying inter-relationships between them and the beneficiaries or the changes that are supposed to result from the project on the poverty target groups. Other projects, especially more recent integrated rural development projects, define:

i) the overall goals of the project (e.g., improvements in agricultural productivity, income distribution, quality of life in rural areas);

ii) the total number of beneficiaries;

iii) the number of beneficiaries belonging to the poverty target group;

iv) the effects and impact expected from the productive and the social component(s); and

v) the expected outputs from activities and resource inputs to the project.

It is quite obvious that the purposes of monitoring, on-going and ex-post evaluation will be easier to define if objectives are systematically structured into a hierarchy.

In consequence, the following steps might help to define purposes and functions for monitoring, on-going and ex-post evaluation after the users of each of them have been identified:

i) review project objectives;

ii) structure systematically all project objectives in a hierarchy according to their level of specificity (e.g., impact, effect, and output objectives);

iii) determine separately the information needs of project/program management, regional and national governmental agencies, international or other agencies;
iv) consider the resources and capacity available for monitoring and evaluation as well as the scope for their expansion (see next section);

v) select on the basis of ii), iii) and iv) key purposes and foci for a low cost approach to both monitoring and on-going evaluation;

vi) define the type of products or outcome for each of these foci; and

vii) set criteria for quantitative and/or qualitative assessment of project progress, outputs, effects and impact.

2. What are the constraints to be considered in setting up monitoring and evaluation systems?

2.17 Financial and manpower constraints usually set tight limits on what can be accomplished. The most important constraints usually are:

i) The human resource base: the design of monitoring and on-going evaluation systems must be within the capacity of the available human resources. If the human resource base is weak, training of monitoring and evaluation staff, by either local or international experts, might be required. In such case, the delay caused by on-the-job training will need to be considered. It will take some time before monitoring and evaluation staff can perform effectively.

ii) The available financial resources: each component of monitoring and on-going evaluation system needs to be fully costed, the feasibility of its financing adequately evaluated.

iii) Time: monitoring and on-going evaluation systems will serve a useful purpose only if they can provide information on time to project management, planners, and decision-makers at higher levels. In consequence, if those systems cannot be established in time, or cannot deliver information on time for decision-making, something is wrong in the design.

iv) Availability of information processing and analysis capacity: not only the human resource base, but also available equipment for information processing and analysis might be a constraint. Large amounts of data will be difficult to process and analyse with hand calculators or even programmable
desk calculators. When computers are required, various constraints of hard (that is, the equipment itself) and soft-ware (that is, the computer programmes required to process and analyze the data) might exist. Furthermore, transportation of the information to the computer might imply additional constraints.

v) Management's information absorption capacity: in addition to the capacity required to manage information collection and analysis systems, the most important constraint, which is quite often overlooked, is probably the project manager's ability and willingness to use the results from monitoring and evaluation.

2.18 If these constraints are ignored in the design of monitoring and on-going evaluation systems, one risks the repetition of errors made elsewhere. From a review of experiences with monitoring and evaluation for rural development projects in several countries, it appeared that the most common problem has been an imbalance between information collected and what could be analyzed. The result often was an accumulation of unanalyzed data, that sometimes had already been keypunched.

2.19 Minimum information systems based on simple approaches for collection and analysis are therefore essential. What ever systems are decided upon, they should be tailored to the needs, purposes and existing constraints in any particular situation.

3. What information is required and which indicators should be used?

2.20 Primary considerations in deciding what information is required are:

i) Who will use monitoring and who will use on-going evaluation results?

ii) What purposes should it serve?

iii) When and how frequent is the information required?

iv) How readily available is the information?

v) How much would it cost to collect the information?

2.21 For monitoring, priority should be given to information which is needed for effective management of project implementation. This implies the collection of information on resource use, activities (starting and completion dates) and outputs. Furthermore, information enlightening specific implementation problems, such as institutional weaknesses, lack of skilled manpower, breakdown of equipment, etc., might be important.
2.22 For on-going evaluation, priority should go to information which helps project management and policymakers to make changes in objectives, institutional arrangements, and resource allocations to projects under implementation. This implies that not only information on project outputs, effects and likely impact needs to be collected, but also the reasons why some results were not achieved. Thus, perceptions and attitudes of project staff, as well as project beneficiaries, might be important information for explaining a gap between actual and planned results. Furthermore, information on critical assumptions, and/or conditions influencing the success of the project could be important input for on-going evaluation.

2.23 The time required to produce monitoring and on-going evaluation results, the information processing, analysis, and cost implications, should play an important role in deciding what information needs to be collected. In general, the lesser the volume and the more readily available the information already is, the more rapidly information can be made available with less cost.

2.24 Collection of information that already exists is a wasteful activity. Relevant sources of data should be examined before resources are committed to information collection systems. In addition, the usability of available information should be critically assessed to ensure that the basis on which the information was collected is valid for the required analytical purposes (especially the sample universe should be reviewed).

2.25 In summary, the absolute minimum information should be selected that can cheaply, easily and timely be collected (if it is not already part of a regular information collection system) to provide quick feedback to project management and/or policymakers.

2.26 Which indicators should be used? Considering the variety of rural development projects, and especially the different mixtures of project components, even for the same type of rural development projects, it is not difficult to make long lists of indicators that can be used for monitoring and on-going evaluation. The relevance of a multipurpose information checklist is, however, very limited. Indicators for checking progress during implementation, or for measuring effects and impact of a project, are project-, area-, or even society-specific. In consequence, for the purpose of selecting indicators, a systematic procedure, such as shown in Figure 1, is more useful than a checklist. The list of steps in Figure 1 shows that, both the most desired information based on the objectives of the project and the types of indicators which can easily, cheaply and timely be collected, should be considered to produce a masterlist of indicators for monitoring and on-going evaluation.

2.27 Some important distinctions regarding types of information and indicators for monitoring and on-going evaluation are:

1) quantitative versus qualitative information;

ii) direct versus indirect or proxy indicators;

iii) flow versus stock information; and

iv) aggregate versus disaggregated information.
Figure 1
Procedure for selecting Indicators and Information Requirements

1. Structure
   Project Objectives

2. Identify objectively verifiable indicators (desired information)

3. Identify users

4. Define purposes of:
   - monitoring
   - on-going
   - ex-post evaluation

5. Define what information is required by each of the users for each of the purposes

6. Determine when users would need the information (quick feedback)

7. List information which is already being collected

8. For information that still needs to be collected, estimate which can be obtained at low cost

9. Decide between desired information (step 2) and what can cheaply and easily be collected
Both qualitative and quantitative information will usually be required. Although most information can, and should preferably be quantified, the major criterion should be whether or not the information can objectively be verified (that is, whether anyone looking at the same situation will come up with the same information).

Information can be obtained through direct or indirect measurement (that is, proxy indicators can be used). If a project intends to make an impact on small farmer income, output, productivity, self-help, nutrition and health status, then some of these concepts (such as INCOME, OUTPUT and PRODUCTIVITY) can be measured either directly or through the use of proxy indicators. For example, real “hard” numbers on income, and income changes can be obtained, but it is cheaper to obtain proxies on expenditures and use them to measure increased real income (specialists can merely observe the uses of increased income in a culture predisposed to a limited number of purchases). 1/ One example of this would be to measure the number of new tin roofs in African villages as a proxy for increases in income. Proxy indicators can provide quick and cheap measurement but, obviously, involve some risks.

One other important distinction among indicators involves their time dimension. INCOME is a flow concept; ASSETS is a stock concept. Some information systems attempt to measure changes in stock items (e.g., land holding, animal assets) as a result of the project, and convert these into flow variables. Measuring ASSETS is valuable, as the project intends to make an impact on productive capacity of small farmers, particularly if land distribution is one of the project’s components. LAND HOLDINGS and ANIMAL ASSETS are, however, concepts within themselves and can be used to explain other change (or lack of it). While changes in stocks may be dependent variables in an analytical system, they are more likely to be explanatory variables that help clarify the kind of project services required for different types of land tenure and size of land holding. Since flow indicators are difficult and costly to collect, stock indicators should be used primarily for monitoring progress during project implementation. On-going evaluation will, however, require collection of some flow indicators.

The amount of information aggregation is also important. A homogeneous target population with one fundamental production environment, would be the circumstance calling for the simplest evaluation system with the fewest information requirements. As there are differences in income, land holdings and land quality, physical environment, marketing systems, ethnic and religious backgrounds, access to markets, credit availability, etc., there are an increasing number of "categories" or "strata" that must be considered. While aggregate data may be useful for evaluation by an international agency, it is not particularly helpful for improving project performance, which may require taking account of differences in the human or physical environment. As a general rule, the more heterogeneous the target group, the greater the need for stratification.

Some limitations of the use of indicators are:

i) indicators are only useful to approximate reality; they are yardsticks which still need to be interpreted; indicators should not assume a life of their own.

1/ See Annex 3 for a more elaborate discussion of these trade-offs as applied to the measurement of rural income.
ii) there may be serious risk and side effects involved in the use of proxy indicators;

iii) indicators should be tested for: validity, independence, objective verifiability, etc.; and

iv) the availability and cost involved in collecting information should be predominant criteria in selection of indicators.

4. How should information be collected and analyzed?

2.33 There is ample choice of information gathering techniques. One of the most useful has been formal or informal committees of the target population to provide regular feedback on their perceptions and actions in cooperation with project services. A second and equally inexpensive technique is the use of small teams who conduct indepth interviews from the target population (e.g., from village leaders) without attempting to create statistical elegance from the interview set. Finally, there are the more systematic quantitative information gathering techniques which consume more manpower and require more structured analytical systems to process the information. Among these these systematic information gathering techniques might be random surveys of greater or lesser depth, carried out from within the project or by outsiders. All these methods may be combined in large agricultural and rural development projects for satisfying the information requirements.

2.34 Any information collection technique that is selected should be within constraints of manpower, time and financial resources as outlined in section 2. If constraints are not rigid, there may be tradeoffs between modifying the purposes and increasing resource availability. If constraints are rigid, the design for monitoring and/or an on-going evaluation system must be modified to fit the available resources.

2.35 The design of a more systematic information gathering technique, such as a survey, would usually involve the following steps:

i) Specification of the Objectives of the Survey: A survey could only be useful if the objectives of data collection and application are clearly understood. Overall objectives are often loosely defined and should therefore be pinpointed in an unequivocal manner before survey design could commence. The specific interpretation of survey objectives and the drafting of operationalized definition should be clearly understood by project management and survey specialists.

ii) Survey Design: The design stage of a survey should concern itself with devising measurement methods and definitions for facilitating data collection. Measurement could take many different forms and involve different methods or combination of methods. The methodology evolved should
take full recognition of resource limitations including time, manpower and its calibre, financial costs and logistical demands. Basic measurement units, geographical extent, target population, should be determined at this stage.

iii) **Questionnaire/Schedule Design:** It should be understood that a questionnaire is only a vehicle for recording information solicited from the respondents. Skillful design could, however, greatly facilitate interviewing. Open-ended questions should be organized in such a way as to standardize as many as possible of the anticipated response patterns. The lay-outs of sections and individual items should be designed in terms of convenience of firstly, the respondent and, secondly, the interviewer. The most appropriate questionnaire is one that closely approximates to a natural flow of a normal conversation with a rural inhabitant. Field work and familiarity with the population are often good policy to forestall, and minimizing delay and confusion.

iv) **Sample Design:** The principle of interviewing the minimum statistical sample should always be followed. The determination of this sample size is a standard procedure in statistics. It is generally true that the minimum sample is a function of the diversity in the universe and of the detail to which analysis is to be performed. These points should be clearly understood by end-users of the information before further planning of the survey is to be undertaken. Known information of the universe could help to minimize sample size requirements.

v) **Field Operation:** This process could be divided into two parts. The first is a field test where all foregoing design parameter are to be tested, and constraints, as well as limiting factors affecting each design stage, are to be carefully examined. When proven necessary, the sample design, questionnaire design, and even survey design, will have to modified in light of the experience gained from field test. The final version of the questionnaire should be printed in quantity only after this stage. Experience on interviewer performance should also be considered as well as training of potential interviewers. Timing of survey should be carefully considered since a considerable margin of accuracy could be gained by collection of the most common type of information; namely, the low-cost recall type data.

vi) **Data Management:** Careful thought should be devoted to the most appropriate form of data processing. The considerations should include such topics as speed and detail of required analysis, quantity of data to be collected, storage and retrieval of data (especially
when data is collected for on-going evaluation, which will require comparison with future data sets). Data management should be coordinated with the analytic capacity.

vii) Analysis: The analysis of survey data requires strong discipline, otherwise a bottleneck will be created. Analysis should be directly related to declared objectives of the survey, and as far as possible, standard techniques should be applied. At present, automated techniques for tabulation, graph plotting, and even mapping, are available.

viii) Reporting: The aim is to produce a timely report on the major findings in the areas specified by the objectives. Arising out of this preliminary report, which could lead to direct action by project management, topics of special interest could be identified, and further analysis to underpin the nature of these topics, could then be undertaken leading to a supplementary report(s). This recursive iteration between analysis and reporting is a guarantee against depreciation of usefulness of the survey. In this way, undue time elapses, generated by over-ambitious analysis beyond the immediate needs or stated objectives, can be avoided.

Figure 2 shows the iterative procedure to be followed for design and implementation of a survey.

2.36 Analysis of information obtained through systematic survey techniques, in-depth interviews, or even informal committees, will require simple analytical procedures and appropriate tools.

2.37 If the number of observations is small, the analytical requirements might be fulfilled with:

- simple cross tabulations of results (e.g., land ownership, employment, income distribution, consumption pattern, migration, productive technology, marketing patterns, etc.); and

- descriptive analyses, i.e., variable by variable comparisons of baseline information with targets or comparison among areas (i.e., relative effectiveness of project in different areas).

Hand calculators might be all what is needed to accomplish this much.

2.38 If, however, explanatory analyses are required, and/or the number of observations is large, it might be necessary to make a choice between the following options:
FIGURE 2: ITERATIVE PROCEDURE FOR DESIGN AND IMPLEMENTATION OF A SURVEY


Obj. Defin.

Survey Design

Questionnaire Design

Statistical Design

Field Testing

Full scale Survey

Data Processing & Mgt.

Analysis

Reporting

Proj. Mgt. Decision

C = Constraint
T = Time lapse
Changed Situation
R = Reaction
i) **Programmable calculators:** Recent advances in programmable calculators have increased their applicability to more sophisticated statistical analysis. Programmable calculators can also be used for partial analysis on segments of large sample data. Some varieties on the market allow for 64 variables in a program with approximately 250 steps; additional storage units can be added.

ii) **Desk portable computers:** The core storage units in some portable computers provide space for 16,000 to 64,000 bytes. Programs are available which include multivariate analysis on a matrix of 50 x 20 variables. For large programs, with variables exceeding the storage or analysis capacity, the data must be partitioned and run in acceptable packages. Not only can these computers be programmed for unique requirements, but they have a wide variety of software packages. The major limitations are size, both in storage and manipulation capacity.

iii) **Computers:** Computerization allows for multivariate analysis which takes account (under certain restrictive assumptions) of multiple influences on outcomes. Standard pre-programmed packages will usually allow far more insights (as well as statistical verification) than can be accomplished by bivariate methods. Especially when it is not clear what information should be collected, factor analysis can be used to determine which variables can be dropped as either non-essential to the analytical process or highly correlated with other variables. Many different levels of computerization are, however, possible. (Some farm management studies in Africa involved nearly total computerization of all data taken from an extended farm management survey.) Clearly, rational limits to the number of variables, and cases which can be computerized, and used in the analysis, must be maintained.

2.39 One drawback of sophisticated equipment is that it will rarely be situated at the project site. This would present an argument for transfer of data analysis to the capital city where a computer might be available. However, there are even stronger arguments for the inclusion in the project of equipment such as hand or programmable calculators that allow in-house analysis of project data. First, because the turn around time will be shorter than transporting the data outside the project area. Secondly, because the credibility of the data will be enhanced when the project staff can explain what has been accomplished, and can perform additional analysis on data at the request of project management. Thirdly, because better equipment might attract staff of high caliber for monitoring and evaluation.
5. How should results be reported or fed back?

2.40 In traditional feedback loops, data is passed upward directly to top decision-makers, who, having set policy, pass the information back down to the bottom level through lower echelon staff. This process will, however, differ radically in a rural development project. A tiered system of information recycling, for example, can enable lower level decision-makers to quicker processing of information, while ensuring that the necessary data for higher level policy decisions is passed up the line. At each level the data should be refined so that only data necessary for decision-making is sent to the next higher decision-making level. Thus, both information feeddown requirements and passage of information to succeeding higher levels, both within and outside the project, should be insured. In some projects this might require information flow from farmer to local organization, to cooperative associations, to institutional credit sources and finally to project management. Since each tier is likely to need less, rather than more information, a carefully designed information system can collect and process data useful for the individual farmer, aggregate this data at the level of the local organization, further aggregate for the cooperative association until only the most necessary information is passed to project management for decisions appropriate at that level.

2.41 Similarly, the results from monitoring and on-going evaluation might be a source of information for cooperative association, extension and other services, to train farmers. In this way, monitoring and on-going evaluation would not only serve the needs of project managers and decision-makers at higher levels, but also directly benefit the farmers and communities involved in the project.

2.42 A graphical presentation of the two-way reporting or feedback systems that need to be conceived between farmer communities, field workers, coordinators, project management and other decision-makers, is shown in Figure 3.

2.43 Which format should these reporting or feedback systems take? This will vary according to level. Regular meetings between project staff and project management would be one way of communicating monitoring and evaluation findings. Project staff themselves might report some of the information obtained through these meetings, to the farmers or communities concerned. On the other hand, project management will usually be required to submit quarterly reports to executive agencies or institutions supporting the project.

2.44 At each level the results from the monitoring or evaluation activities must be understandable to those who are responsible for taking action on them. The more sophisticated the results, the more time and effort will be required for communicating them to the next level. Effective communication of monitoring and evaluation results is as important as their production.

6. How should monitoring and on-going evaluation be organized? What staff is required?

2.45 Many factors need to be taken into account for the organization and staffing of both a monitoring and evaluation system. The major ones are:
FIGURE 3: REPORTING AND FEEDBACK SYSTEM FOR MONITORING AND EVALUATION

Rural Communities

Field Workers

Field Coordinator; Day-to-day Operations; Primary Evaluations

Project Management, Operation Control and Secondary Evaluation

Operational Results/Problems and Policy Issues

Local Policy Makers

Socio-Economic Evaluation (Every 2/3 Years)

Policy Decisions Overall Planning Program

Feedback 1 Evaluation

Feedback 2 Evaluation and Policy Matters
2.46 The organization of both monitoring and/or on-going evaluation unit should be governed by one important principle: both should be located functionally and organizationally as close to the decision-making point as possible. The reporting of monitoring findings to decision-makers should be as direct and as rapid as possible and the feedback loops should be as short as possible.

2.47 This would imply that monitoring should be part of project management. On-going evaluation for the purpose of both project management and policymakers, can either be done within the project through a monitoring and evaluation unit, or by a central evaluation unit. The obvious solution for many projects, in which rapid feedback is needed, is a combination of the above options; namely, a monitoring and on-going evaluation unit attached to the project and an independent agency charged with longer term evaluations (particularly evaluations for policy planning by government ministries and/or international agencies). Ex-post evaluation, which serves mainly the purpose of providing a basis for future policies and programs, can better be located in a central unit for policy and program coordination.

2.48 The kind of tasks that a monitoring and on-going evaluation unit within a project will serve, should be explicitly stated. Above considerations taken together with an assessment of capacity of other institutions, will indicate the quality and number of staff required. Shortages of qualified staff in most developing countries, and the fact that monitoring and evaluation functions are seldom given the high priority they deserve, have often caused understaffing. Careful planning of manpower for a monitoring and on-going evaluation unit is therefore required.

2.49 If project management is responsible for both monitoring and on-going evaluation, it can either rely on the staff of the operating departments or have its own field staff for information collection (or use both). The first would mean that only a relatively small professional group would be needed to assemble and analyze the information obtained from the staff of the operating departments. When project field staff are directly involved in acquiring data from the target population, it will affect their understanding of the "best" development approach and will help modify their recommendations at the farm level. This also helps ensure that policy changes, as project management directs new approaches to technology or new priorities for development assistance, are more rapidly accepted and implemented. As the project develops a two-way communication flow (up from target population through staff to project management, and down through the same chain), important benefits occur through developmental change. This is because development in most instances is dependent upon
behavior changes of the target population, and effective two-way communication promotes and reinforces such changes.

2.50 Alternatively, the monitoring and on-going evaluation unit within project management, might dispose of its own field staff for information collection. In this case, enumerators, supervisors, and tabulators are required to support a small professional group, which constitutes the unit.

2.51 The major technical assistance requirements in both cases might be for overall system design, questionnaire design, testing, and information analysis. Furthermore, training of field project staff, enumerators and supervisors in information collection (especially interviewing) and processing techniques, might require technical assistance.

7. **How much should be invested in monitoring and on-going evaluation?**

2.52 From a review of some 20 rural development projects, of both bilateral and multilateral agencies, it appeared that on the average, roughly three percent of the total project costs were allocated to monitoring and evaluation. Some systems absorbed, however, as little as .11%, while others required up to 8% of the total project costs. There is yet no evidence to prove that these investment levels or proportions of the total project costs for monitoring and evaluation are optimal.

2.53 From a review of experiences with monitoring and evaluation systems for rural development projects in several countries, it appeared that there is frequently an imbalance between information collection and information analysis. Too frequently, large volumes of information are collected that by lack of human and/or technological capacity, remain unanalyzed. One basic criterion should therefore be: the volume of information to be collected should be proportional to the volume that can be analyzed. Furthermore, if information will not be used for decision-making, it should not be collected. This criterion will severely limit resources needed for monitoring and on-going evaluation. However, it cannot be over-emphasized that monitoring and on-going evaluation of rural development projects are the principal sources of information for the improvement of our knowledge and understanding of rural development.
SELECTED REFERENCES

1. The Rural Development Concept


2. Monitoring and Evaluation Guidelines


3. Indicators, Information Collection and Analysis for Monitoring and Evaluation


4. Applications


5. Bibliography

# Project Design Summary and Monitoring and Evaluation Frameworks

Table 1: Integrated Agricultural Development Project in Kenya

Table 2: Transmigration and Rural Development Project in Indonesia

\[1/\] References in Tables 1 and 2 are referring to the annexes in project appraisal reports.
TABLE 1: PRODUCT DESIGN SUMMARY AND EVALUATION FRAMEWORK FOR INTEGRATED

PRODUCT DESIGN

OBJECTIVES
- To provide the establishment of "whole farm" systems through a strategy of phased development of smallholder agriculture;
- To achieve a balanced growth between production (crop and livestock) and infrastructure support in order to ensure an acceptable economic return to Kenya at a cost which can be sustained by the Government over the long term.

PROJECT EFFECTS
A. Increased farmer income
B. Less local shortages and surpluses and more stable agricultural prices
C.D. Increased production of maize, beans, potatoes, passion fruit, cotton, groundnuts, milk and beef
E.F. More complete coverage of farmers by cooperative societies

PROJECT OUTPUTS
1. New Proctor Unit in the Land and Farm Management Division of NIA
2. Extension services and trained extension workers
3. Distributed farm inputs
4,5,6. More farmers incorporated in institutional services
7. Increased use of hired labor during peak periods
8. Increased livestock production
9. Macro and Micro Monitoring and Evaluation results
10. Trained senior project staff

MAGNITUDE OF OUTPUTS
1. Before Sept. 1 of each project year, submission of Annual Work Plans
2. 1,700 extension staff members trained
3. See above yield and production projections
4,5,6. From year 5 on, 3,500 farmers per year will benefit from the fund
7. 270 man-days a year instead of 25 man-days a year for the average Project farm
8. Not defined
9. Quarterly reports and input to Work Plans

PROJECT INPUTS/ACTIVITIES
1. Provide vehicles, supporting services and staffing for Project unit
2.1 Provide incremental vehicles, housing, support facilities for extension services
2.2 Establish demonstration farms and provide re-orientation courses in Farmer Training Centers
3. Distribute physical farm inputs to cooperative unions and through them to societies and farmers
4. Strengthen Maize and Produce Board, and Agricultural Crops Development Authority
5. Provide staff and equipment for credit institutions
6. Supply credit to farmers on a revolving fund basis
7. Offer farmers credit up to 75% of their own farm requirements including hired labor
8. Strengthen Veterinary and Animal Production Department in project area
9. Staff for Project Monitoring and Evaluation
10. Project staff training and fellowships
11. Technical advice, studies and consultancies

QUANTITY OF INPUTS/RESOURCES
1. Annex 10, Table 2
2. Annex 10, Tables 3 and 4
3. Annex 10, Tables 5 and 6
4. Annex 10, Tables 7 and 8
5. Annex 10, Tables 9 and 10
6. Annex 10, Tables 11, 12 and 13
7. Annex 10, Table 13
8. Annex 10, Tables 14 and 15
9. Annex 10, Table 16
10. Ksh. 2 million or US$252,000
11. Ksh. 6 million or US$750,000

TABLE 1: PROJECT DESIGN SUMMARY AND EVALUATION FRAMEWORK FOR INTEGRATED

MEASURES OF ACHIEVEMENT OF PROJECT IMPACT AND BENEFITS
A. Increase in Farmer’s Income
   Annual income of a typical low zone farmer is expected to increase from Ksh. 760 to about Ksh. 3,100 at fourth harvest. Annual income of a typical high zone farmer will increase from Ksh. 1,200 to about Ksh. 4,900.
B. Incremental Production at full development in FY86
   51,000 tons of maize with Ksh. 51 million (at 1984/85 prices in 1975 constant price)
   4,000 tons of beans; Ksh. 9 million
   36,000 tons of potatoes; Ksh. 12 million
   56,000 tons of passion fruit; Ksh. 26 million
   2,000 tons of cotton; Ksh. 4 million
   6,000 tons of groundnuts; Ksh. 9 million
   7,000 tons of beef; Ksh. 21 million
   34 million liters of milk; Ksh. 23 million

C. Yields over 4 years for typical:

<table>
<thead>
<tr>
<th></th>
<th>High Altitude</th>
<th>Lowland</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Farmer</td>
<td>Farmer</td>
</tr>
<tr>
<td>maize</td>
<td>from 1 to 2.7</td>
<td>from 0.8 to 2.3</td>
</tr>
<tr>
<td>beans</td>
<td>from 0.54 to 1.1</td>
<td>from 0.54 to 1.1</td>
</tr>
<tr>
<td>potatoes</td>
<td>from 5 to 10</td>
<td>from 1,000 to 1,600</td>
</tr>
<tr>
<td>passion fruit</td>
<td>from 5 to 15</td>
<td>per cow</td>
</tr>
<tr>
<td>milk</td>
<td>from 100 to 170</td>
<td>from 0.23 to 0.65</td>
</tr>
<tr>
<td>beef</td>
<td>from 100 to 130</td>
<td>from 0.6 to 1.2</td>
</tr>
<tr>
<td>cotton</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>groundnuts</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

D. Area of Crop and Livestock development: TOTAL: 163,000 ha.
   - maize 50,000 ha.
   - beans 12,000 ha.
   - potatoes 2,700 ha.
   - passion fruit 3,500 ha.
   - cotton 6,800 ha.
   - groundnuts 3,500 ha.
   - pasture for livestock 83,500 ha.

E. Number of farmers reached: (1.25 families per holding) 70,000

F. Number of smallholdings: 56,000
**TABLE 1**

<table>
<thead>
<tr>
<th>MEANS OF VERIFICATION</th>
<th>IMPORTANT ASSUMPTIONS</th>
<th>COMPARING LONG-TERM VALUE OF PROJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MONITORING AND EVALUATION DESIGN</strong></td>
<td><strong>ASSUMPTIONS AFFECTING INPUT-TO-OUTPUT LINE</strong></td>
<td></td>
</tr>
<tr>
<td>1. <strong>Micro-evaluation</strong></td>
<td>1. Sufficient demand is anticipated for all project effects.</td>
<td></td>
</tr>
<tr>
<td>Purpose: To assess periodically the managerial effectiveness of the Project including (a) effectiveness of individual delivery systems; (b) effectiveness of coordination among various services; and (c) employment, foreign exchange and other macro-economic effects of the Project.</td>
<td>2. Determination of appropriate (absolute and relative) commodity prices by parastatal organizations and approval by Government.</td>
<td></td>
</tr>
<tr>
<td>Information: Effectiveness of Project Management and institutions, types of project beneficiaries, employment, income distribution, aggregate production, foreign exchange costs and benefits, budgetary implications and other sectoral and macro-economic aspects. Reporting of results in this and subsequent Work Plans (in this way, close connection would be established between evaluation and planning throughout life of the project). Responsibility: Central Bureau of Statistics.</td>
<td>3. Changes in price relationships are likely to produce changes in the quantities of production and could lead to production of crops not at present anticipated.</td>
<td></td>
</tr>
</tbody>
</table>

**ASSUMPTIONS AFFECTING INPUT-TO-OUTPUT LINE**

1. Yields will generally be greater for farmer in the higher (usually rainier) zone than for those in lower zones.
2. Likelihood of drought in one year out of four.
3. Yields are expected to increase cumulatively until reaching the projected maximum in fourth harvest following farmer's first use of project services.

**ACCOUNTING AND AUDITING**
- Accounting by Financial Controller in Program Unit and separate recordkeeping by NGOs, PMR, Cooperative Bank, ACE, KNCC, Cooperative Union, and Societies involved in Project and MDA.
- Independent auditing of accounting records
- Quarterly reporting of project activities, achievements and problems by Head of Program Unit.

**ASSUMPTIONS FOR OBTAINING PROJECT OUTPUS**
## Project Objectives

<table>
<thead>
<tr>
<th>Conditions Indicating Achievement of Project Effects</th>
<th>Indicators, Variables, and Activities</th>
<th>Measurement of Achievement of Project Impact</th>
<th>Means of Verification</th>
<th>Important Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions Indicating Achievement of Project Effects</td>
<td>1. Increase yields and farm income of settlers.</td>
<td>1. No indicators are specified for health and nutritional effects.</td>
<td>Social and economic studies on the impact of the new settlement on rural development and settlement areas.</td>
<td></td>
</tr>
<tr>
<td>1. Increase yields and farm income of settlers.</td>
<td>2. Create employment for settler families.</td>
<td>2. No indicators are specified for health and nutritional effects.</td>
<td>2. This solution will be replicable throughout the transmigration program in Indonesia (USD $200 per family package).</td>
<td></td>
</tr>
<tr>
<td>2. Create employment for settler families.</td>
<td>3. Reduce the cost of transport of market goods for entire project area.</td>
<td>3. No indicators are specified for health and nutritional effects.</td>
<td>3. The planning and implementation methodology adopted for this new settlement area will be institutionalized in DOT.</td>
<td></td>
</tr>
<tr>
<td>3. Reduce the cost of transport of market goods for entire project area.</td>
<td>4. To improve health and nutritional status of settlers.</td>
<td>4. No indicators are specified for health and nutritional effects.</td>
<td>4. Long-term credit or self-financing will be available for 2nd and 3rd ha. planting of rubber, which would assist the farmers in the new settlement areas to bridge the replanting period and provide them with additional income.</td>
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<tr>
<td>4. To improve health and nutritional status of settlers.</td>
<td>5. To reduce land pressure and under-employment in the areas of settler origin.</td>
<td>5. No indicators are specified for health and nutritional effects.</td>
<td>5. Malaria can be controlled in the settlement areas.</td>
<td></td>
</tr>
</tbody>
</table>
... cooperative services. Village roads
4.2 two thousand wells and supply
4.1 health centers and village health posts, designed diagnostic questionnaires
1.1 0.5
1.2 cattle, fertilizers
1.3 expanded agricultural credit, expansion and cooperative services.
(ii) Settlement Upgrading at Way Abung
1.1 0.5 ha. per settler family of block planted rubber and maintenance for six years
1.2 distributed cattle
1.3 expanded agricultural credit, expansion and cooperative services in 20 villages
1.4 feasibility studies and detailed engineering plans for irrigation facilities
3. all weather roads, village roads, and upgraded existing village roads.
4.1 health centers and village health posts, plus equipment and staffing new secondary schools
4.2 two thousand wells and supply of handpumps and 5,000 pit latrines.

<table>
<thead>
<tr>
<th>Project Topics/Activities</th>
<th>Quantity of Inputs/Resources</th>
<th>Quality of Inputs and Cost Controls</th>
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</thead>
<tbody>
<tr>
<td>Construction of 10 village centers, 4,500 settler houses, 3 health centers 10 village health posts in Nateraja; 2 health centers and 22 village health posts in Way Abung.</td>
<td>Contracts for civil works for: - roads: 9.2 million - villages and housing: 86.6 million - agricultural support facilities: 50.7 million - Contract between DGT and PNP for black planting of 7,000 ha of rubber and its maintenance for up to six years: $10.7 million - Provision of vehicles and equipment: $3.7 million - Procurement, transport and distribution infrastructure for 9,000 head of cattle from Java or from abroad to the settlement areas: $11.9 million - Consultants and Technical Services for: - project implementation 223 man-months - project monitoring 120 man-months - project preparation 300 man-months - technical services US $1.7 million equivalent</td>
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<tr>
<td>Distribution of motorcycles and 4 wheel drive vehicles for staff at each health center, plus equipment for each center and pit latrines in Way Abung.</td>
<td>Civil works, livestock quality and cost control would be carried out by PNP assisted by consultants.</td>
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<tr>
<td>Digging of 2,000 wells, supply of handpumps in Way Abung; and installation of 4,500 pit latrines in Nateraja and 5,000 in Way Abung.</td>
<td>PMN's rubber planting are subject to quality inspection by an independent consulting organization representing the DCT estates; periodic inspection and satisfactory certification also by internationally recruited rubber inspectors (20 man-months over 5 years) employed by PNP.</td>
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<tr>
<td>Construction of low-cost roads system with simple wooden bridges and culverts and 15 meter permanent bridge across Gilas River.</td>
<td>Tankers and Technical Services for: - project implementation 223 man-months - project monitoring 120 man-months - project preparation 300 man-months - technical services US $1.7 million equivalent</td>
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<tr>
<td>Land clearing, supply of polybag planting material and fertiliser.</td>
<td>1. Earliest establishment of the health services with particular emphasis on the malaria control program.</td>
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<td>Employment and training of settlers for planting, maintenance, fertilising and weeding for six years after planting.</td>
<td>2. Earliest possible formulation and implementation of a term lending program for smallholder tree crop development.</td>
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<tr>
<td>Credit aid for food, inputs for food crop production and house garden establishment, farm implements and clothing.</td>
<td>3. Export taxes will not be increased beyond 5% of the international rubber price.</td>
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<tr>
<td>Establishment of a seed production farm and nursery in the Nateraja area.</td>
<td>4. Current farm gate prices for rasswax, groundnuts and garden crops in the project areas will remain constant over the life of the project.</td>
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<tr>
<td>Construction of a rubber tapping school on a 100 ha. adjoining the Nateraja area.</td>
<td>5. The subsidised DNP's price of Rp. 80/kg for urea and TSP, applied to food crops will remain constant throughout the project life.</td>
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<tr>
<td>Employment of extension staff in the DCT village management.</td>
<td>The projected decline in fertilizer prices (in constant terms) will substitute the present subsidy.</td>
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<tr>
<td>Establishment of a village level cooperative (KUD's) in Nateraja area.</td>
<td>6. The cattle component will produce one saleable animal every two years valued at $120.</td>
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<tr>
<td>Expansion of credit facilities, agricultural extension staff and existing KUD's in Way Abung.</td>
<td>7. PMN will be able to enlist the fullest cooperation of the regular line departments of DCT and their Governmental agencies.</td>
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<tr>
<td>Methodology:</td>
<td>8. The major transmission coordinating committees will play an active role at the national provincial and district levels in planning and monitoring of the project.</td>
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<tr>
<td>1. Broad data collection on two villages for the purpose of determining key indicators including non-qualifiable indicators.</td>
<td>9. The participating Government agencies will be fully committed to the role outlined in their respective Memoranda of Agreement with DCT.</td>
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The measurement of project's impact on incomes raises at least four separate issues that need to be addressed. These are:

1. the points in the project cycle at which incomes should be measured;
2. the sample over which household income is to be measured;
3. the means of measuring income; and
4. the economic sectors to be included in the analysis.

These issues, and the way in which information collection and analysis interact, are discussed below.

It is generally accepted that incomes should be measured in the pre-project situation and again after (and possibly during) project implementation. Many monitoring/evaluation units, however, are not set up in time to measure pre-project incomes. However, good project design should be based on comprehensive base-line information. In consequence, pre-project income levels for major target groups ought normally to be available from project preparation documents. It would facilitate the design of monitoring and evaluation components if such information is also made available in project appraisal reports. If the base-line information for project preparation did not include pre-project income levels, it is still important that the pre-project situation be approximated by the inclusion in the opening survey of households which have not yet been influenced by the project. Thus, the timing of the opening survey and the selection of the sample for that survey are dependent. Sample selection should also be designed such that the survey is not confined to a target group or to the direct project beneficiaries. Most agricultural/rural development projects affect an entire region and it is of considerable interest to assess the impact of the project not only on the direct beneficiaries, but also on a variety of indirect beneficiaries. The sample of households, therefore, should be representative of the rural economy as a whole.

There are at least two possible approaches in which income can be measured. The first, based on a one-shot survey, attempts to impute income (a flow concept) from information on the household's ownership of producer or consumer assets (a stock concept). With regard to producer assets, area sown to different crops, the number of livestock, etc., can be used in conjunction with independent estimates of the return to each type of asset to arrive at a measure of agricultural income. This figure should then be adjusted in the light of family size and composition to allow for hired labor and off-farm employment. Finally, information on land ownership, and hence rental obligations or receipts, can be used to arrive at a final estimate of household income. With regard to consumer assets, some relationship can be assumed between the ownership of, say, watches or radios, etc., and the owner's level of income. The second, more superior, method recognizes that income is a flow concept and attempts a direct measure by means of a series of surveys spread over a clearly defined decision-making period such as an agricultural cycle.

Despite the clear conceptual superiority of the flow approach, the choice between the two approaches is not obvious because the flow approach is necessarily much more expensive. Moreover, the choice between the two approaches should not be made independently of the proposed depth and type of analysis. That is, to a large extent the data requirements are determined by the nature of the proposed analysis. Thus, if the intention is to analyze the impact of the project simply in terms of trends in various macro variables and the change in the agro-economic profile of the average farmers, then adequate information can be generated by the stock approach. On the other hand, if the flow approach is adopted, then the need for frequent (possibly weekly) interviews implies a major data-gathering exercise which, once established, can generate information not only on incomes but also, at a very small marginal cost, on a variety of other aspects of household behavior such as expenditure patterns, labor allocation, the consumption-savings decision, the importance of risk and so on. Such exercises should be complemented by a major analytical effort in order to maximize the value of the collected information.

For many Bank projects the resource constraint will prohibit the flow approach: concentration on the stock approach will minimize data collection costs, leave available for a large part of the year a pool of enumeration resources for problem-specific surveys, and limit the extent of analysis to that which can be managed by the evaluation unit itself. For some projects, however, where either the Government or the Bank has expressed a particular interest, it may be appropriate to measure income as a flow. In such case an attempt should be made to shed light on the appropriateness of the one-shot surveys which only provide information on stock variables. That is, where information is available on both flow and stock variables, the accuracy of various short-cut methods of imputing income from the stock of producer or consumer assets can be rigorously tested. On the basis of such work in a number of cases, it should be possible to prepare standardized instructions for questionnaire design for the stock approach which can then be adapted to suit local conditions.

The final issue is the economic sectors to be included in the analysis. An evaluation exercise should include an assessment of project impact on the volume and type of business in the region. Clearly, this goes beyond what can be achieved by household survey techniques and requires specialized sectoral surveys. Thus, instead of mounting a mainline survey every year, it may be a better use of enumeration resources to mount such a survey every other year and in the intervening years conduct a number of specialized sectoral surveys.