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Monitoring and Impact Assessment Systems

For

The Rapti and RCU Projects

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Table of Contents

Executive Summary		i
I.	Introduction	1
II.	RCUP and Rapti Projects	4
III.	Institutional Development	8
IV.	Forestry	13
V.	Agriculture	23
VI.	Livestock	34
VII.	Non-agricultural Income Generation and Rural Credit	37
VIII.	Women	40
IX.	Soil Conservation	43
X.	Rural Works	47
XI.	Conclusions and Recommendations	50
Annex A:	Scope of Work	53
Annex B:	Persons Met in Nepal	57
Annex C:	Methodology for Summarizing Cropping Systems Data	59
Annex D:	Glossary	62
Annex E:	Checklist of Priority Indicators for the Two Projects	63

EXECUTIVE SUMMARY

Overview.--The purpose of the consultancy is to assist two regional AID projects in Nepal to improve their monitoring and evaluation systems. The Resource Conservation and Utilization Project (RCUP), and the Rapti Rural Area Development Project are multi-faceted projects that both began in 1980, in remote regions poorly served by roads. RCUP focuses on watershed management, and has spent about $20 million, while the Rapti project focuses on improving agricultural production and the quality of life, and has spent about $15 million. There are three tiers of management for the projects: the many line agencies of His Majesty's Government (HMG) in each project region, which conduct most field work, the project coordination offices, which monitor and coordinate, and the mission, which oversees the projects.

Problem.--Monitoring and evaluation for these two projects is unusually difficult, because expenditures are spread thinly among many project components, and over areas in which hundreds of thousands of people live. Aggregate indicators of the impact of the projects as a whole on the regions as a whole are not appropriate. Major portions of project funds have been spent for construction, training and other outputs that do not impact immediately. The outputs that do impact immediately have benefitted specific areas, but have been too small relative to the size of the project regions measurably to affect total production or the average quality of life or quality of environment.

Devising a set of indicators for each of the many components of each project is appropriate, but is costly. It also makes great demands on the time of the mission and the project coordination offices, because the indicators for each component require a separate conceptual underpinning--which managers must first master and then communicate to the appropriate line agencies, in order to persuade them of the need for the indicators.

The three-tiered management of the projects complicates the design of indicators for feedback into decisionmaking. The many HMG line agencies that implement project components routinely collect a wide range of data and report their outputs to the project coordination offices. Because the line agencies already have their own indicators, which show the achievement of output targets set by their central offices in Kathmandu, their interest in developing new indicators for assessing impact or for monitoring effectiveness depends largely on input from the mission. In the past, the mission has commissioned voluminous baseline studies and special studies of broad policy issues for the two projects; the studies have not, however, laid the groundwork for ongoing indicators. In future, indicators designed by the mission or the project coordination offices can help better to inform the mission about the projects. In order, however, for the indicators to be fed back into decisionmaking, the mission and the offices would have to convince the line agencies of the value of using such indicators for their own decisions.

Conclusions and recommendations.--The monitoring and evaluation systems proposed in the project extension papers for the two projects are a good beginning, but need to be further developed. Much of the necessary data are already being collected by field offices, or can easily be collected. Such data could be tabulated and summarized at modest cost.

In general, the projects need three kinds of indicators. 1. Indicators of impact, expressed, where feasible, in relation to measures of the scale of the problem being addressed. 2. Monitoring indicators, which help managers to track performance in regard to activities for which there are grounds for concern. 3. Contextual indicators, which portray the "big picture" in the project regions, and thus help managers plot strategy.

For the forestry components of the two projects, the proposed major indicator of impact is a measure of the productive power of the nurseries that have been established as going concerns--specifically, the annual number of seedlings planted and distributed, multiplied by their first-year survival rate. For monitoring purposes, plantings should be tabulated separately for fuel, fodder and timber trees, in order to check whether enough fodder trees are being planted. The proposed measure of the scale of the forestry problem is an estimated number of seedlings that would have to be planted annually over the long run fully to meet the needs of the regions.

For agriculture, proposed major indicators show yield gains and the demonstration effect for the Cropping Systems Program (CSP), a program for encouraging selected farmers to grow improved cereal grain varieties. For yield gains, a solid database is available for CSP in the Rapti Zone; it needs to be summarized, and the measurement of baseline yields needs to be strengthened. A small survey is needed to measure the demonstration effect of CSP on the neighbors of participating farmers. As contextual indicators, the Rapti project should track aggregate cereal grain production for the zone and should develop, in consultation with in-country experts, judgemental estimates of potential gains in production to be expected from various feasible improvements in agricultural practices.

Other components. The proposed major indicators for institutional development show building completions and staff development, the spread of extension activity, and the extent of local participation in projects. For livestock, they show changes in fodder supply. For employment and income generation, they show the effectiveness of training and credit programs. For rural works, they show time saved by beneficiaries as a result of scheme completion, and the quality of users' groups. Indicators were also proposed for soil conservation, and for women's participation in projects. For small-scale programs that are difficult to summarize in quantitative terms, spot checks and rapid appraisals were recommended.

Because the usefulness of quantitative information depends critically on its comparability over time and between places, advance planning is indispensible for monitoring and evaluation. Mission staff needs to put a much higher priority on simply collecting good data and putting the data to good use--for example, using the new indicators to review progress in periodic project reports. Leadership by the mission will be needed, in order to patiently win the interest of the project coordination offices and line agencies in the new indicators. The mission may wish to insist that any future special studies draw on and/or contribute to an integrated system of indicators. Although some key indicators are immediately available or can quickly be prepared, it will require several years of sustained effort by management before a full flow of useful information comes on line.

I: Introduction

The Resource Conservation and Utilization Project (RCUP), and the Rapti Rural Area Development Project are multi-faceted projects that both began in 1980. The RCUP concentrates largely, and the Rapti project concentrates entirely, on the development of remote rural areas that are poorly served by roads. RCUP focuses on watershed management, and has spent about $20 million so far, while the Rapti project focuses on improving agricultural production and the quality of life, and has spent about $15 million.

There are three tiers of management for the projects: the many line agencies of His Majesty's Government (HMG) in each project region, which conduct most field work, the project coordination offices, which monitor and coordinate, and the mission, which oversees the projects. Fourteen line agencies are involved in implementing programs sponsored by the Rapti project, 10 for RCUP, although RCUP expects to reduce the number somewhat in the future. Inasmuch as many of these agencies have more than one program that is sponsored by the projects, the number of activities funded by the projects is formidable. This chapter deals with some general issues related to the design of indicators for monitoring and evaluation for both projects.

A. The Problem

Monitoring and evaluation for these two projects is unusually difficult, because expenditures are spread thinly among many project components, and over areas in which hundreds of thousands of people live. Aggregate indicators of the impact of the projects as a whole on the regions as a whole are not appropriate. Major portions of project funds have been spent for construction, training and other outputs that do not impact immediately. The outputs that do impact immediately have benefitted specific areas, but have been too small relative to the size of the project regions measurably to affect total agricultural production or the average quality of life or quality of environment.

Devising a set of indicators for each of the many components of each project is appropriate, but is costly. It also makes great demands on the time of the mission and the project coordination offices, because the indicators for each component require a separate conceptual underpinning--which managers must first master and then communicate to the appropriate line agencies, in order to persuade them of the need for the indicators.

The three-tiered management of the projects complicates the design of indicators for feedback into decisionmaking. The many HMG line agencies that implement project components routinely collect a wide range of data and report their outputs to the project coordination offices. Because the line agencies already have their own indicators, which show the achievement of output targets set by their central offices in Kathmandu, their interest in developing new indicators for assessing impact or for monitoring effectiveness depends largely on input from the mission.

In the past, the mission has commissioned voluminous baseline studies and special studies of broad policy issues for the two projects; the studies have not, however, laid the groundwork for ongoing indicators that can be fed back into decisions. Moreover, the studies have usually lacked

effective summaries that can be integrated into broad reports that review project accomplishments. As a consequence of these limitations, the studies have not contributed effectively to the organization of information for monitoring and evaluation. A newly-arriving manager, or project officer, is swamped by the weighty historical record, which provides little guidance for decisionmaking. Unlike a manager of a business, a project manager has no database that he can turn to, to learn at a glance how things are going, and where trouble is brewing.

In future, indicators designed by the mission or the project coordination offices can help better to inform the mission about the projects. In order, however, for the indicators to be fed back into decisionmaking, the mission and the project coordination offices will have to convince the line agencies of the value of using such indicators for their own decisions.

B. A Life-cycle for Development Activities

Among the many activities undertaken by the projects, the team observed that some were large-scale activities that were moving towards full production--a phase in which managers attempt to blanket a target area with a new method of doing business. Other activities, in contrast, could be described as experimental and developmental--a phase in which managers attempt to learn more about the applicability to target areas of a new method of doing business. These phases may be thought of as elements of a kind of life-cycle of a development method.

The forestry components of the two projects are an example of an activity in a full production phase, in the sense that the annual output of seedlings planted and distributed in the project areas has already reached a level that may, in order-of-magnitude terms, represent as much as 10 percent of an output level that would be necessary over the long run to meet the needs of the project areas. In contrast, the distribution of several hundred smokeless, fuel-saving stoves in both project areas is an example of a strategy at the experimental or developmental stage, in which the objective is presumably to learn more about the possibilities for mass distribution of stoves.

Distinguishing phases in the life-cycle of a development activity helps managers to formulate more clearly their information needs. For activities that are reaching towards a production phase, managers need to monitor: (1) the productive power of new facilities--for example, the annual rate of output of seedlings planted and distributed by nurseries; (2) the overall scale of the problem being addressed--for example, the number of seedlings that would have to be planted annually over the long run in order to supply target areas with sufficient fuel, fodder, and timber; and (3) key linkages in the production process--for example, the survival rate of seedlings once planted. Another example of a key linkage is the demonstration effect on neighboring farmers of a program for encouraging selected farmers to plant new varieties of cereal grains. For activities that are experimental or developmental, managers need to monitor what they are learning and what they want to learn.

C. Types of Indicators

In general, it is useful to distinguish three types of indicators, which correspond to three kinds of information needed by managers of the two projects:

1. Impact indicators are broad measures of progress toward project goals and purposes, expressed, where feasible, in relation to measures of the scale of the problem being addressed. In places where the word "impact" appears inappropriate, "achievement indicators" has been used as an alternative term.

2. Monitoring indicators help managers to track performance in regard to specific activites for which there are grounds for concern. These indicators may also be thought of as "red flag" indicators. The indicators provide a "close-up" view of specific details of project activities in regard to which managers anticipate that they may need to intervene.

3. Contextual indicators portray the "big picture" in the project regions, and thus help managers plot strategy. Contextual indicators are particularly appropriate for projects that aim at the overall development of large regions. The indicators track regional developments that lie beyond the power of the projects to influence, at least in the short run.

Most of the indicators proposed by the team are based on four kinds of sources. (1) Tabulations that are already available in project offices or other government offices, and simply need to be given appropriate attention. (2) Data that are available in field offices or in project offices, but that need to be tabulated and summarized. (3) Remote sensing by satellite and aerial photography, which is just beginning to provide both projects with a flow of data on the overall situation in the project regions. (4) Rapid appraisals or spot checks for qualitative monitoring at specific sites.

In the sprawling, roadless areas served by the projects, the time required to walk to each of the sites to be surveyed is a major factor in the cost of rapid appraisals and spot checks. In order to economize on walking time, two kinds of adjustments may be appropriate: making do with information on fewer sites than would otherwise appear desirable, and combining surveys of several activities in one and the same walking tour.

D. Administrative Arrangements

Although the bulk of this report is concerned with the design of specific indicators, there is a need for some consideration of administrative arrangements for implementing effective monitoring and evaluation systems for the two projects. This section discusses administrative arrangements briefly.

The monitoring and evaluation plans proposed by the mission staff in the recent extension papers for the two projects are a good beginning, but need to be further developed. In order to implement monitoring and evaluation plans, mission staff in the future will have to put a much higher priority on collecting good data and putting the data to good use than has been the case in the past. Although some key indicators are immediately available

or can quickly be prepared, it will require several years of sustained effort before a full flow of useful information comes on line. Such an effort will require advance planning, leadership, and a commitment to making good use of good information.

Because the usefulness of quantitative information depends largely on its comparability over time and between places, advance planning is necessary to assure uniform data collection procedures by field offices, and to initiate time series and collect baseline observations in good time. In the absence of planning, the fragmentary data that reach the mission often turn out to be of little use. For example, a costly baseline survey that shows what the situation in the project areas was 5 years ago, is of little use for current decisionmaking. Similarly, a report on crop yields achieved under a program for encouraging farmers to use improved varieties of cereal grains is of limited use, in the absence of a baseline measure of pre-program yields on similar plots.

Another aspect of advance planning, and of leadership as well, is the need for mission staff to spend considerable time in the process of patiently winning the interest of the project coordination offices and the line agencies in the proposed indicators. For reasons that were stated in section A, mission staff should anticipate that implementation of a system of indicators for each project will be rather costly and time-consuming.

Mission staff will probably find that its own consistent, effective use of the indicators will facilitate the communication of its interest in the indicators to the project coordination offices and the line agencies. For example, periodic project reports should make substantial use of the indicators for review of progress and for any efforts to refocus strategy. For another example, before approving any future special studies of policy issues for the projects, mission staff may wish to insist that the studies draw on and/or contribute to the indicators. If mission staff fails to integrate the new indicators into its own review and decisionmaking processes in a major way, it is unlikely to be able to motivate other agencies to maintain interest in the indicators.

The next chapter deals with some features that are specific to each of the two projects. The following eight chapters deal with indicators for thematic components that, in many cases, are common to both projects. A final chapter summarizes conclusions and recommendations. Appendix E provides a checklist of priority indicators separately for each project.

II: The Rapti Rural Area Development Project and The Resource Conservation and Utilization Project.

In order to set the stage for discussion of a suggested data system for monitoring and evaluation, it will be useful to briefly describe the two projects in terms of their context, goals and purposes, and major components.

Both projects face similar conditions of poverty and environmental deterioration. The classic list of statistical indicators of Nepal's formidable poverty starkly sketch the magnitude of the development challange. Per capita annual income is estimated at $140, about 80 percent of adults are illiterate, life expectancy at birth is 45 years--there are 1500 persons per square kilometer of arable land in the mountain and hill areas, average size of family land holding in these areas is less than 0.4 hectare, and average productivity of the land is falling.* Forests are being denuded, manure is increasingly being used as fuel rather than fertilizer, and soil erosion threatens the natural resource base of the nation's economy.

The projects are "to meet the basic needs of Nepal's poor majority" (Rapti) or "to improve the standard of living of the rural poor" (RCU.) and both projects set about accomplishing these goals by developing an institutional capability to assist beneficiaries to increase agricultural and forestry productivity. The projects differ, however, as to how they approach this task so that separate descriptions of the projects will be useful.

A. The Resource Conservation and Utilization Project (RCUP)

As the name of the project implies, an emphasis in design and implementation of the project has been resource conservation or, in the words of the project purpose "the protection and restoration of the soil, water and plant resource base upon which the rural population is totally dependent". To accomplish this purpose a significant proportion of project resources has gone to institutional development; much of this institutional infrastructure is now in place and emphasis is shifting to increasing the flow of inputs to project beneficiaries.

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* One of the eight districts included in the two projects, Dang-Deokhuri, is not in the mountains or hills but in the terai, but the FAO rates it as the second most severely eroded district in Nepal and its land tenure-ethnic conflict situation ensures that most of its residents will remain abysmally poor despite relatively high agricultural potential.

The RCU Project has field activities in two catchment areas in Gorkha, Mustang, and Myagdi Districts and it is these activities, serving an estimated population of about 300,000 people, that are considered here. The project also supports development of the national-level Institute of Renewable Natural Resources (IRNR) and has a large participant training component. These components are not considered further in this report.

The RCUP logical framework proposed as measures of goal achievement: (i) improved income distribution, (ii) foreign exchange savings attributable to a decrease in food imports, and (iii) improved nutritional intake and thus family health. Measures of purpose achievement appear more directly related to project strategy and to actual implementation policies: (i) soil loss reduction, (ii) increased agricultural production, (iii) increased rural employment, and (iv) increased per capita availability of fuelwood and fodder. Nevertheless, these measures suffer from a lack of direct correspondence with major project activities and from severe measurement problems. They are too non-specific and the required data are too elusive.

In the following chapters of this report indicators are suggested that can be developed from existing or easily collectible data--indicators that either reflect project impact on the environment (forestry and soil conservation indicators) or on beneficiaries (agriculture, livestock, rural works, and women indicators.) Indicators are also suggested for the essential institutional development component of RCUP; these are monitoring indicators that reflect progress in formation of a sustainable institutional infrastructure. Finally, monitoring indicators are suggested for management use in all major components of the project. All of these indicators relate directly to actual project activities as observed in the field and as reflected in project expenditures. The starting point for definitions of all indicators is the Project Impact Assessment Plan (PIAP) contained in the Project Extension Paper (PEP)

A step back from these highly specific indicators with a view towards the project in context suggests two "contextual indicators" that, over time, may betoken a broader improvement in the quality of life and environment of the project area.

The first of these contextual indicators is a measure of improvements in environmental stabilization based on on-going analyses (at the National Remote Sensing Centre) of aerial photographs taken in 1962, 1978, 1982 and 1985, for the project area as a whole and (of more immediate interest) for project "impacted areas" where sufficient resources have been committed to reasonably expect an improvement. The indicators would be percent changes in forest land, barren land and severely eroded land and would be designed not to evaluate the project but to provide a background to project efforts--to place RCUP within a dynamic context. The use of these indicators is discussed further in section B of chapter VII.

The second contextual indicator is a measure of improvements in the nutritional status of the beneficiary population based on the 1975 "Nepal Nutrition Status Survey"* and on a follow-up survey that might be done in cooperation with the AID "Integrated Rural Health" project. Such a survey, like the 1975 AID/CDC survey should aim to "obtain maximum useful information-using a minimum of staff, inexpensive equipment and uncomplicated technologies that can be analyzed easily." Just as a contextual indicator of environmental stabilization reflects the panoply of forces re-forming Nepal's environment, a contextual indicator of nutritional status captures changes in well-being of the poor majority. It thus tells us at a glance whether we continue to labor up the steepest Himalayan slopes or we toil against improving odds.

B. The Rapti Rural Area Development Project

The Rapti Project adopts an area approach to rural development, with relatively more focus than the RCUP on basic infrastructure (roads, irrigation, credit, and training for example) and relatively less emphasis on environmental stabilization. The project now has a major forestry component, however, that serves as an essential complement to other components that aim to directly increase rural incomes. For RCUP, forestry is the driving activity in the project.

Rapti Project purposes are: (i) "to increase... quality of life, including income and production levels" and (ii) "to improve local demand for and control of national delivery systems for improved agriculture, health, education, resource management, and family planning." Thus the project logical framework explicitly recognizes that a major purpose of the project is development of HMG's institutional capability in the Zone <u>and to</u> foster increased local participation.

The project logical framework suggests that food production, food consumption, employment opportunities, and average labor productivity be indicators of "quality of life" improvements. As is discussed in the following chapters of this report, however, these indicators are too difficult of quantification to be useful for management purposes. This report focusses attention on those aspects of project activities that are critical to overall success: institutional development and local participation, spread of new cropping systems, training and credit for new income-generating opportunities, and movement toward a more sustainable balance between livestock and the forests and

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* Not conducted in Mustang District.

grasslands. All the indicators suggested in the following chapters of the report pertain to the Rapti Project--a reflection of its comprehensive nature as an area rural development project. It is also suggested that both contextual indicators discussed above under RCUP be developed for the Rapti Zone.

One final contextual indicator might be developed based on easily observable proxies for village well-being that could, over time, show improvements in those villages most affected by the Rapti Project. Persons familiar with local culture (and intra-zonal cultural differences) could develop a list of "prosperity indicators" based on local perceptions of well-being. Examples would be house construction materials and size; number and type of rooms; floor materials; roofing materials; type of windows; bedding; lighting; presence of radios, cassette players, etc.; refreshments served to guests; food; clothing (as shown by laundry); need for outside employment or artisanal income--to adapt a list developed for use in Indonesia.* Although the team is not recommending such an indicator at the present time, it is an approach with promise in the absence of any reliable income measurements. A tentative beginning towards the development of such an indicator would be routinely to assess the availability of food in households and villages of the hill districts according to a uniform format. This would be done by project staff whenever they went on tour, and perhaps also by interested line agency officers.

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* Ann Soetoro, "Prosperity Indicators for Java", 1979.

III. Institutional Development

Institutional development is the cornerstone of both the RCU and Rapti projects. It endeavors to build a sustainable capacity to deliver needed services to project beneficiaries. Its measure is not merely buildings constructed and staff hired but success in efficiently delivering services to a broad spectrum of participating rural people.

Project management, therefore, needs to know that the basic institutional infrastructure is being developed in a timely fashion. Given the already substantial achievements of the two projects in developing institutional infrastructure, however, management information requirements must emphasize considerations of institutional effectiveness.

Indicators of institutional development may be categorized as follows:

A. Progress in staff development;
B. progress in construction of physical plant;
C. service delivery performance; and
D. accomplishment in reaching beneficiaries directly and in motivating them to participate in project-supported activities.

Data collection and analysis requirements expand in shifting from categories 1 and 2 to category 4, but so does the value for management purposes of the information obtained. In each case, however, the indicators suggested are based either on already available data (often unintelligible in present form) or on results of a rapid appraisal.

Institutional development by itself is not expected to directly improve the wellbeing of project beneficiaries. It is a prerequisite to the realization of project benefits. Therefore, all indicators of institutional development are monitoring indicators; none are impact indicators.

A. Indicators of Progress in Staff Development.

The RCU and Rapti projects have had as major objectives the expansion and upgrading of line agency staff in project areas. This has led to more officer-level (B.Sc. or higher) staff in the districts and many more extension workers. Incentives have become available to make positions in remote project areas more attractive and thus staff more stable. To monitor progress in staff development and in contact of officer-level staff with field realities, the following indicators are suggested. The first three can be computed easily by the PCO or SECID.

1. Number of officer-level positions currently filled (and unfilled), by gender, by district or watershed and by line agency (including PCO for Rapti).

2 Number of extension agent-level positions (JT and JTA) currently filled (and unfilled), by gender, by district or watershed and by line agency.

3. Proportion of staff posted outside district centers, by gender, by district or watershed and by line agency.

4. Proportion of time officer-level staff spend in Kathmandu and on tour in their districts or watersheds (or zone) outside the district or zonal center. These data should be collected annually for line-agency officers in all districts of each project. These data can be compiled by SECID expeditors for RCUP and by the PMEU for the Rapti Project.

B. Indicators of Progress in Construction of Physical Plant.

A critical element in staff support is office and warehouse facilities. Two indicators are suggested: the first an indicator of achievement and the second a monitoring need to alert project management to trouble spots. Both the PCO and SECID regularly collect these data.

1. Number of offices and warehouses and number of squaremeters of office and warehouse space whose construction is completed for each district or watershed, as a percent of total programmed in the project.

2. Number of months each office or warehouse building project is falling behind schedule. The more detailed construction project monitoring format (with a page per project) adopted by SECID in its SAR is recommended for both projects.

C. Indicators of Service Delivery Performance.

Once staff are in place and physical plant is constructed, management emphasis on institutional development shifts to asking whether or not outputs are being delivered in a timely fashion. An achievement of satisfactory institutional development is a substantial increase in the delivery of services to beneficiaries. Two indicators are suggested. The first is available from PCO or SECID data and the second is a measure of delays in government releases of funds to line agencies.

1. For selected key construction activities, average time from scheme approval to scheme completion, together with a comparison with past and desirable time-to-completion; key activities might

include nursery establishment and drinking water schemes.* All schemes in each category should be monitored. One of the purposes of this monitoring activity is to determine those factors that impede progress; for example, remoteness, size of scheme, or implementing agency.

2. In Salyan, the team was told by an agricultural JT that he had not received his pay for three months. It turned out that this sort of thing is not rare in the Zone. The reason for it is that, under the laws and practices of HMG, funds for the current four-month period are not released to line agencies at the district level, until all questions concerning expenditures for the fiscal year have been resolved. It follows that unresolved questions concerning an advance of funds to one official, for example, can tie up funds for the entire agency, thereby hampering the agency in its normal work.

In a meeting with Mitra Lal Upadhya, Acting Project Coordinator for the Rapti Project, it was agreed that the PCO could easily establish a system monitoring these st ppages of funds, and that such a system might help the PCO to intervene from time to time to facilitate the release of funds.

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* If it can be shown that financial flows in nearly all activities are comparable, and that other factors do not differentially impede activities such as nursery establishment and irrigation system construction, then it is recommended that the RCUP PEP PIAP indicator for institutional effectiveness and development be used. The indicator is described as follows in the PEP.

"Institutional effectiveness and development will be measured by the ability of GON departments to react in a timely manner to environmental issues and work tasks. One objective of participant training and construction of field centers under the project is to increase the responsiveness of the GON in dealing with resource conservation issues. One measure of this is the timeliness of financial flows. The target of the project is to reduce the time needed to respond (from budgeting to completion an activity) by 50%. A benchmark point for response will be determined from GON and RCUP records, beginning in 1980. The comparable, so one activity will be chosen as a representative indicator. Nursery development is chosen as the indicator of financial flows. This activity is conducted by four of the major agencies working with the project, DSCWM, DOF, DLDAH, and DOA. Using the financial records from these departments, the time required for various steps in the financial flows process can be determined with accuracy".

The plan devised by the team and Mr. Upadhya is to set up a checklist, showing, for each of the 5 districts in the Zone, the line agencies represented there. For each Nepali month, a staff member of the PCO would examine the monthly expenditure reports of the participating line agencies for each district. The reports are normally received by the PCO sometime during the middle of the following month. By rapid examination, he would note whether salaries had been disbursed for the month, and would form a quick judgement as to whether other disbursements were in line with the expected rate of disbursement, or were below the expected rate. It was agreed that, inasmuch as the checklist was an informal one, rapid appraisal would be sufficient for the purpose at hand.

A summary measure of the number of district line agencies for which salaries were not disbursed, and the number for which other disbursements were below the expected rate, could be communicated regularly to USAID. A similar indicator is aleady being used by RCUP and has been found to be effective in monitoring bottlenecks in funds disbursement.

D. Indicators of Outreach and Local Participation

Both the Rapti and RCU projects aim to increase peoples' access to governmental services. To do this, both projects emphasize expansion of extension and input (credit, nursery seedlings, fertilizer, improved seeds and livestock) services to reach more beneficiaries. Given the critical nature of extension, indicator 1. focusses on the increasing geographic coverage brought about by the establishment of service centers and by increases in numbers of livestock and agricultural JT's and JTA's. Based on records of sample service centers,* neighboring panchayats are graded "high", "intermediate", "low" or zero in terms of total number of farmer contacts made in the past year. This information is most effectively presented on a map of the Rapti Zone or RCU catchment areas with panchayats colored to represent level of extension contact. A time series of geographic coverage should be constructed as data become available.

1. Geographic coverage of livestock and agricultural extension workers, disaggregated by gender.

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* The team visited several service centers and examined in detail the types of data recorded. For example, at Kaperkot in Salyan, the livestock JT recorded all farmer contacts by farmer name, panchayat, and type of contact. The JT agreed that he could aggregate his annual contracts by panchayat, gender of farmer, and whether the activity was fodder related.

2. Beneficiary contribution to costs of rural works and soil conservation schemes, as percent of total scheme cost, by gender, by type of scheme (e.g., drinking water supply or terrace improvement.) This indicator is readily available from the PCO or SECID.

The local contribution (in terms of labor) to rural works and soil conservation schemes is a measure of local interest in the scheme and of local willingness to contribute to community development. It falls far short, however, of being an indicator of peoples' participation in development and for that key element of institutional development it is necessary to examine the extent to which beneficiaries actually become involved in building a future that they consider desirable and worth the effort.

It is suggested that peoples' participation be measured by the number of beneficiaries (disaggregated by gender and major ethnic group) who actively become involved in project activities; such as, Panchayat Resources Development Plan (PRDP) inventories and planning under RCUP; SFDP and PCRW group activities under Rapti Project; forest management plan development; and user group activities for irrigation, rangeland and pasture management, and drinking water systems. Actual involvement implies attendance at meetings and participation in group activities (for example, pipeline maintenance.) Mere membership in a group for the purpose of gaining access to credit or to satisfy a formal requirement is not enough.

This indicator will be developed based on rapid appraisal surveys of PRDP, SFDP. PCRW, and user group activities. A sample of all three ongoing PRDPs, all existing PCRW groups, 5 SFDP groups in each project, 5 DWS user groups in each project, and 75 percent of the irrigation user groups in each project should be sufficient. Where possible, this work should be done by the projects' social scientists in conjunction with rapid appraisals of project activities that are suggested elsewhere in this report. That would apply, for example, to irrigation users' groups. A summary statement of the indicator is the following.

3. Number of beneficiaries involved in planning, designing, constructing, and/or maintaining schemes, disaggregated by type of beneficiary involvement and by gender.

IV: Forestry

A. Broad Indicators of Impact

The plantation of new trees is the most important activity for the forestry components of the Rapti Zone and RCU projects. Protection of existing forest is a separate activity, which will be discussed briefly at the end of this section.

1. Plantation Activity

In designing an impact indicator for the plantation of new trees, it is important to take account of two key features of the plantation activity: the fact that the activity is developing at very high rates of growth in the project areas, and the fact that there are many steps to the process of producing new trees.

a. The planting of new trees in the two regions is a process that has begun only recently and that aims at eventually planting massive numbers of trees. The process is developing and indeed must develop at very high rates of growth in order to provide the regions with the forest resources they require. Underlying the rapid growth rates is the creation of facilities such as nurseries, the buildup of staff at the local level, and the management of their operations to assure the desired quality and quantity of outputs. Once the facilities and staff are in place, and are producing at the rates and quality levels for which they were designed, they represent a "going concern." Accordingly, management attention should be directed towards the size of this going concern, in terms of some measure of its annual flow of accomplishments.

b. Inasmuch as there are many steps in the process of producing tree fodder, fuel and timber for use by Nepal's villagers, it is important to give some thought to which step is the most critical for the purpose of measuring the annual flow of work accomplished.

In the first step, nurseries are established, with the objective of providing an average of about one nursery per panchayat. Each nursery has a certain annual capacity to produce seedlings, about 25,000 for panchayat-level nurseries, or about 100,000 for larger, division-level nurseries. The team visited several of these nurseries in the two project areas, and they appeared to be going concerns.

In the second step, seedlings from the nurseries are planted each year in plantations, or are distributed to farmers for planting on their own land.

In the third step, some of the seedlings survive the first year, which is the year for which mortality is greatest.

In the fourth step, as the trees grow larger, increasing absolute amounts are added annually to the stocks of fodder, fuel and timber trees.

In the fifth step, the trees will eventually provide a flow of fodder, fuel and timber to the local inhabitants.

In the long run, the most comprehensive measure of beneficiary impact would be a measure of the services that the trees will provide. However, trees take time to grow, and well-run nurseries take time to blanket a local area with new forest. Accordingly, it is appropriate to measure the flow of accomplishments at an earlier step. The team believes that the measure of the impact of the plantation activity at its present stage of development should be the annual flow of surviving seedlings from nurseries into plantations or into farmers' own plots. More specifically, it should be the number of new seedlings that are planted or distributed annually, multiplied by their first-year survival rate.

As will be explained below, survival rates can readily be collected. Until such time, however, as survival rate data are available, the number of new seedlings that are planted or distributed annually will stand as a good proxy for the desired measure. Because the number can be readily calculated for earlier years, it can serve as the basis for a readily-available time series. (In the areas that the team visited, survival rates appeared to be reasonably high at most plantation sites.) For future years, a new time series can be developed for the flow of surviving seedlings.

The cumulative measure of total area forested or total seedlings planted since the onset of the project is a less satisfactory measure of achievement than a measure of annual flows, because it fails to take account of the fact that the purpose of AID involvement is not just to plant trees, but rather to establish a going concern that will undertake the planting of trees at satisfactory rates on a sustained basis.

An illustrative example will help to clarify the advantage of a flow measure over a stock measure that cumulates flows since the onset of the project. Consider two five-year projects, with the following annual rates of plantation of surviving trees.

	Project 1	Project 2
First year	100,000	300,000
Second year	200,000	300,000
Third year	300,000	300,000
Fourth year	400,000	300,000
Fifth year	500,000	300,000
Cumulative project total	1,500,000	1,500,000

Although both projects planted the same cumulative number of surviving seedlings, the team argues that the first project is having a greater impact than the second one, because it has established a going concern of nurseries and staff that have the capability of planting 500,000 seedlings per year, whereas the first project has established nurseries and staff that have the capability of planting only 300,000 surviving seedlings per year.

2. A Yardstick for Measuring Progress in Tree Plantation

The measure of plantation activity will be more meaningful if it can be compared with a suitable yardstick. The yardstick should somehow reflect the scale of the problem that the plantation activity is addressing.

For the sake of comparability with the measure of achievement, the yardstick should be in terms of the number of seedlings per inhabitant that would have to be planted each year in a region of interest in order for the situation to be reasonably under control. The yardstick may be termed a strategic target that can give the mission a better notion of how much more remains to be done before the forestry situation comes under reasonable control. It would not be appropriate to think of such a target as one that must be met by a certain date. Rather, it is a contextual indicator that can help managers to see how far they have come, and how far they have to go.

The proposed strategic targets differ in two ways from existing HMG targets. First, the existing targets represent a firm commitment for achievement during a definite period, such as a five-year plan, whereas the proposed targets represent no commitment, but simply describe an ultimate objective that may or may not be attainable in the forseeable future. Second, the proposed targets have a substantive meaning and a substantive relation to the problems of Nepal that can easily be explained, whereas the HMG targets reflect HMG's understanding as to what is feasible in a definite period, such as a five-year plan. Accordingly, the proposed strategic targets in no way conflict with existing HMG targets, but simply put those targets, and project achievements, in a larger context that is easier to explain.

The team believes that there is no need for the mission to undertake a new study in order to develop rough strategic targets for the Rapti and RCU regions. It appears that sufficient information is already available for the purpose, in the form of studies that have been undertaken by other agencies, and in the form of the mature judgement of many Nepalis and expatriates who have worked in forestry in Nepal. The team heard talk of several rules of thumb that have some currency in Nepal: one was that it was necessary to have an average of one panchayat-size nursery (25,000 seedlings per year per panchayat) operating in every one of Nepal's 4,000-odd panchayats; another was that it was necessary to plant 10 trees per person per year; still another was that it was necessary to plant a million trees per year per district.

What is needed is for the mission to examine existing information on relevant species for the Rapti and RCUP regions, and to come up with a best judgment as to a rough strategic target, in terms of the number of seedlings that would have to be planted and survive per inhabitant per year in order for the situation in the Rapti and RCUP regions to come under control in the long run. It should be emphasized that what is needed for this purpose is a kind of rough-and-ready, back-of-the-envelope calculation for the use of management, not a definitive measure. The target may have to be based on certain assumptions as to the proportions of fuel, fodder and timber species, and the accessibility of the plantations to villages. The target will certainly have to be based on some assumptions as to the number of years over which the desired level of plantation activity would have to be maintained in order to cover a sufficient area with intensively-managed forest. Such assumptions should be clearly stated. The strategic target can be regarded as provisional: as managers learn more about the forestry needs of the project areas in coming years, they may wish to re-examine the target at a suitable time.*

The strategic target, in terms of surviving seedlings planted per inhabitant per year, can be used for measuring progress at both the panchayat level and the district, catchment-area, and zonal levels. Thus, it may turn out that plantation activity in some panchayats where nurseries have been established is already quite large in relation to the strategic target, whereas for larger areas (which include many panchayats that do not yet have nurseries), plantation activity may still be relatively small in relation to the strategic target.

3. The Protection of Existing Forest

When existing, degraded forests in Nepal are protected from encroachment by livestock, natural regneration can in many cases lead to rapid growth of new trees. The World Bank sector study stated that such protected forests, if properly managed, can

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* Nepal: Issues and Options in the Energy Sector, Report of the Joint UNDP/World Bank Energy Sector Assessment Program, Report No. 4474-NEP, August 1983. The report proposed an accelerated nationwide fuelwood plantation program under which 100,000 hectares would be planted annually in the Nineties.

For fodder tree needs, see the FAO study by S. G. Sharma, "Animal Husbandry and Feed Resource Management in the Phewa Tal Project, chapter 5, and Fodder Trees and Tree Fodders of Nepal, by K.K. Panday. Other individuals who are knowledgeable about fodder tree requirements in Nepal include L. P. Sharma of the Department of Livestock Development and Animal Health, and Devendra Chapagain, an economist with the Ministry of Agriculture.

eventually produce two to five times as much firewood per hectare as unmanaged ones. Presumably, their yield in fodder and timber would also increase sharply.

In this context, the handover of land to panchayats for intensive management as local sources of fodder, fuel, and timber is, in principle, a promising line of development. However, it is an activity that is only beginning in the two project areas. As the activity develops, managers will want to monitor the handovers to determine whether they are actually accompanied by improved management, whether villagers cooperate with the management plans by keeping their cattle out of the forests, and so forth. Inasmuch as it is still too early to say whether such handovers as are currently taking place reflect real impovements in protection of existing forest, the team recommends that the number of hectares handed over to panchayats for their protection not be used as a broad indicator of project impact for the time being. Instead, the team recommends in section B-2 below that the mission develop a method for monitoring the quality of management under handovers.

B. Specific Indicators for the Monitoring of Performance

1. Indicators Included in the Monitoring and Evaluation System for Community Forestry

The team supports the exceptionally comprehensive, practical, and well-designed monitoring and evaluation system for community forestry in Nepal that has been prepared by the HMG/UNDP/FAO Community Forestry Development Project.*

On the understanding that HMG is encouraging adoption of the Community Forest monitoring and evaluation system throughout Nepal, the team believes that both projects should work with HMG to implement the system in the project areas. At the same time, the team recognizes that it may require some time to introduce the entire system in the project areas. Pending full implementation, the team recommends that the forestry components of both projects undertake immediate efforts to encourage their counterparts to implement two indicators in the proposed system that are critical for monitoring the success of the projects--that is, a measure of plantation by species, and a measure of survival rates.

a. **Tree Species.**--The first indicator is a measure of the plantation of trees by species. For the use of nonspecialists, the measures should be summarized by species that are predominantly for fodder, fuel, or timber use. Managers will find such measures particularly useful for the purpose of monitoring the extent to which plantation activity is meeting fuel needs on the one hand, and fodder needs on the other. On several occasions, the team encountered concern that forestry programs may not be giving sufficient attention to fodder trees, at least in certain panchayats. Managers should understand that failure to meet the demand for fodder trees will reduce the incentive for villagers to cooperate with forest plantation

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* See the following reports published by the HMG/UNDP/FAO Community Forestry Development Project, and written by J. Gabriel Campbell and Tara N. Bhattarai. Monitoring and Evaluation System for Community Forestry Development in Nepal, Field Document No. 4a (revised 1984), Data Collection Guidelines for Monitoring and Evaluation of Community Forestry Activities in Nepal, Field Document No. 5, March 1984, and Plantation Survival, Private Planting, Improved Stove Use, and Knowledge Increase in Community Forestry: Results from On-Going Evaluation Surveys, 1982-83, Miscellaneous Document No. 14, August 1983.

activity by keeping their cattle out of the plantation areas. Some investigators believe that fodder trees represent a more pressing need than fuel trees in many parts of Nepal.*

Records of seedlings distributed and planted in block plantations are normally kept at each nursery. At two nurseries that the team visited in the Gorkha district, in the RCU area, the nurseries already keep records on seedlings planted and distributed, by species, but do not at present summarize them by species. For such nurseries, the projects should ask the district forest controllers (DFC's) to request nurseries to summarize their records by species, and to report them to him or her. At two nurseries that the team visited in the Dang District of the Rapti Zone, however, records were not kept by species. For such nurseries, the projects should ask the DFC's to request nurseries to keep records by species, summarize them, and report them to him or her.

b. Survival Rates--As was mentioned earlier, information on survival rates is critical for measuring the impact of the plantation program. Sampling methods for monitoring survival rates, by species, are described in the reports on the Community Forestry monitoring and evaluation system. At the present time, information on survival rates does not appear to be collected at nurseries, or at any other level, in either of the project areas. The team recommends that the projects move rapidly to establish a system for monitoring survival rates. In areas where nurseries are not yet keeping records on plantation and distribution by species, managers may want to consider the possibility of quickly establishing a system for monitoring overall survival rates for all plantations and for all distributed seedlings. The measurement of survival rates by species could not begin until nurseries in the area first began keeping records of plantation and distribution by species. Survival data should be disaggregated between fenced and unfenced plantations. Data on the causes of mortality should also be collected using the Community Forestry Program format.

2. Other Indicators

The team recommends three other indicators for the RCU areas, to take account of certain features of the RCU forestry component.

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* See, for example, John Wyatt-Smith, "The Agricultural System in the Hills of Nepal: the Ratio of Agricultural to Forest Land and the Problem of Animal Fodder," APROSC Occasional Papers: 1, Agricultural Projects Services Centre, Kathmandu, March 1982.

a. National Forests.--At least in the Gorkha district of the RCU area, three agencies have been involved in the plantation of trees: the Department of Soil Conservation and Watershed Management, which has concentrated on the establishment of panchayat forests, for eventual use by villagers, the Department of Livestock Development and Animal Health, which has concentrated on the distribution of fodder-tree seedlings to farmers, and the Department of Forestry, which has concentrated on the plantation of tracts of National Forests.* Manyof these latter tracts are remote from villages, and are not expected to be handed over to local panchayats for their use.

Because forest plantations at remote sites are unsuitable for meeting the fodder and fuel needs of villagers, the team recommends that the mission monitor such plantations, and report them separately from plantations at more accessible sites. A reasonable criterion, in terms of distance, or walking time, should be established for distinguishing remote from accessible sites.

For the purpose of comparing the annual number of seedlings planted and distributed, and surviving the first year, with the strategic target discussed above in section A-2, it may be appropriate to exclude plantations at remote sites from the numerator, inasmuch as the remote plantations may not contribute substantially to meeting the need measured by the strategic target.

b. Panchayat-protected Forests.--As was previously mentioned, the handover of tracts of existing forest to panchayats for local management is a new development in both project areas. As the handovers proceed, the team recommends that spot checks be made from time to time of the quality of management of the tracts that have been handed over. A trained forester could spot check the situation in such a tract by examining its management plan,** and by inspecting the forest to see whether livestock have been grazing there, and whether lopping of branches and cutting of firewood are concentrated in areas designated for current use, or spread throughout the forest as in unprotected forests.

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* It is expected that the forestry activities of the DSCWM will be turned over to the Department of Forests in the RCUP area next year.

** See Catherien de Water, Summary of Initial Forest Management Plans Prepared for Community Forest, Miscellaneous Doc. No. 24, HMB/UNDP/FAO Community Forestry Development Project, for a discussion of the contents of such plans.

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c. Stoves.--Inasmuch as the World Bank's energy sector study recommended that mass distribution of fuel-efficient stoves was the most cost-effective way to meet the demand for firewood in Nepal in the near future, it is appropriate to discuss the distribution of such stoves in this chapter.

The distribution of stoves in both project areas has been on a small-scale basis. The team recommends three indicators for the stove programs: first, the number of stoves distributed; second, the number of stoves being used; and third, qualitative indicators of lessons learned from the program.

The number of stoves distributed is of interest for two reasons: first, as a measure of the size of the program, and second, as an indicator of economies of scale. A recent benefit-cost study done for SECID concluded that, inasmuch as the administrative costs of organizing stove-distribution programs are substantial, the cost of distributing stoves declines substantially with the number distributed*. The most recent surveys in Nepal of stove use suggest that it is also important to monitor stove use.

Qualitative indicators of lessons learned from the distribution programs are important, inasmuch as stove programs have not yet gotten beyond small-scale distribution, and there appear to be problems with acceptance of the stoves in some areas. Rapid appraisals should be used to obtain the data for such indicators.

C. Contextual Indicators

The contextual indicators that will be of interest to managers of the forestry components of both projects have to do with changes in the areal coverage of forest in the project areas--both for the areas as a whole, and for specific subareas. The National Remote Sensing Center is now producing for RCUP maps showing forest coverage for 1962, 1978, 1982, and 1985, and maps showing changes in coverage for pairs of years. It is in a position to supply the Rapti Project with such maps for large parts of the zone and arrangements have already been made for this to be done. The maps can, in turn, readily be used to estimate the number of hectares covered by forest, and can be used to evaluate the quality of the forest cover as well. Finally, the maps can be used to measure the extent to which deforestation reflects extension of cultivation, and the extent to which it simply reflects the destruction of existing forest, with no extension of cultivation.

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* Section II, "Appropriate Technology/Energy Component," by Edward Vickery and Jennifer Wood, in the draft benefit-cost study submitted to SECID on March 22, 1985 by Edward Vickery.

It should be clearly understood that the measure of the extent of forest cover cannot at the present time be viewed as a measure of project impact. The destruction of Nepal's forests has been taking place at a rapid rate, and it cannot be reasonably expected that the plantation programs undertaken in the two project areas since 1980 can have reversed this destruction. Indeed, the World Bank energy sector study cautioned that even an accelerated program for the nationwide planting of 100,000 hectares per year in the Nineties would not reverse the continuing decline of the area covered by forest, although it would supply enough intensively-managed forest to meet the country's fuelwood needs.

D. Summary

The proposed broad indicator of impact for the plantation of new trees is the annual flow of new seedlings planted in new plantations and distributed to farmers, multiplied by their first-year survival rate. Until such time as survival rates are available, the annual flow of new seedlings planted and distributed can serve as the indicator.

The team proposes that the mission develop a strategic target for the average number of seedlings that would have to be planted and survive per inhabitant per year, in order for the fodder, fuel and timber situation in the project areas to come under control over the long run. The target would serve as a yardstick against which managers could compare the current annual output of surviving seedlings.

The team recommends that the projects move to implement the proposed monitoring and evaluation system for community forestry, and particularly those parts of the system that relate to the number of seedlings planted and distributed by species, and survival rates by species. The team further recommends that the projects monitor the share of seedling plantation taking place at sites that are remote from villages, the quality of management in panchayat- protected forests, the number of stoves distributed, and the lessons learned from the stove-distribution program.

The proposed contextual indicators are the areal extent of forest cover in the project areas, and the areal contribution of the extension of cultivation to declines in forest area.

V. Agriculture

This chapter deals with agriculture, excluding livestock and agricultural credit. Livestock is treated in the next chapter. Credit programs for farmers, and for small-farmer groups, are discussed in chapter VII, because many of the loans under these programs are for nonagricultural purposes. It should be understood, however, that the credit programs contribute to raising agricultural production by means of two kinds of loans: those for the purchase of improved seeds and commercial fertilizer, and those for the purpose of land improvement and small-scale irrigation.

It is RCUP's intention to phase out their agricultural activities by handing over Myagdi District work and the Marpha Farm to the Agricultural Research and Production Project and by phasing Gorkha District work into the Hill Food Production Project. As a consequence, the team suggests that RCUP not monitor agriculture beyond the turnover dates and that the survey of the spread of new cropping systems and technologies (as discussed in V.A.3 below) not be undertaken in RCUP.

A. Broad Indicators of Achievement

The Cropping Systems Program (CSP) is a national, AID-supported project for extending the use of improved seeds and commercial fertilizers in cereal grain production, particularly for paddy, wheat and maize. In the Rapti Zone, CSP is the only activity of the agricultural component for which technical assistance has been provided and in which the PCO has been involved. Sanford S. Smith, cropping systems specialist for PADCO, has provided a solid data base for CSP work in the Rapti Zone,* a data base that does not exist for the normal extension, training, and imput provision activities of the project. In the RCU areas, the consultants agree with ARC's suggestion that the SECID agricultural consultant use the methodology outlined herein to assess work accomplished in agriculture in Myagdi District.

The CSP has been introduced to date in 27 panchayats in the Rapti Zone. In each panchayat, the objectives of the program are to raise agricultural production by encouraging most or all farmers there to adopt new methods--primarily, new seeds and commercial fertilizers. In constructing broad measures of achievement for the program, it is necessary to consider that the program tries to achieve its objectives in four stages.

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* Contract Completion Report, by Sanford S. Smith, Cropping Systems Specialist, Rapti Integrated Rural Development Project, April 1985.

a. The first stage is a site description, together with a survey of key informants, such as the pradhan panch, three knowledgeable farmers in each of the nine wards of the panchayat, grain sellers, and relevant officials. The survey gathers information about cropping patterns, the availability of water, land distribution, seed types in use, average yields, and the extent of use of commercial fertilizers.

b. The second stage consists of pre-production verification trials (PPVT's), in which test cropping-pattern technologies are tried out on small plots under the close supervision of extension officers. Inputs are provided free of charge by the Department of Agriculture. At harvest time, crop cuttings are taken, and measures are calculated for the yield under the recommended practices and under the farmer's own traditional practices.

c. In the third stage, the best of the tested technologies are recommended to farmers for "block production," for which farmers must pay for their own inputs. Under block production, supervision by extension workers may be less intensive than under PPVT's, and some inputs, such as fertilizer, may turn out not to be available at the time that it is needed. Block production comprises larger areas than PPVT's. At harvest time, extension agents take crop cuttings for block production areas.

d. In the fourth step, neighbors of the farmers who participate in the block production programs presumably take note of the productivity gains achieved under the program, and, as a result, spontaneously adopt the new practices on their own, with help from extension workers, available agricultural credit, and the services of the Agricultural Inputs Corporation and local cooperatives--which sell commercial fertilizers and improved seeds. In the long run, with normal rainfall and no unusual disturbances from plant enemies, progress at the fourth step would have an impact on aggregate measures of production for the whole zone.

The ultimate measure of the impact of the CSP will be a measure of its impact at the fourth step. However, it is far too early to expect to see an impact on district or zonal measures of production, at least for the Rapti project, and probably for RCUP as well. Measures of production for selected panchayats in which the program has been operating for some time are not readily available, because the estimates of production prepared by the Agricultural Statistics Division are prepared at the district level, not at the panchayat level. Accordingly, the team proposes that the mission try to monitor the progress of the program at the second, the third, and the fourth step of the CSP process, using information that is either readily available or that can be obtained without undue cost. The proposed monitoring system would provide managers with some information

on beneficiary impact, and would also provide managers with information on key linkages between the second, third, and fourth steps of the program--information that is vital to determining whether the assumptions underlying program strategy are valid ones.

1. Indicators for the PPVT's

The quantity indicators for the PPVT's are readily available: they are the number of ongoing separate trials being conducted each year, the number of panchayats in which they are being conducted, and the percentage of panchayats in which they are being conducted. Thus, in 1985, 205 running trials were being conducted, in 27 panchayats in the Rapti Zone. The number of panchayats is approximately 13 percent of the 230 panchayats in the zone. In the future the gender of participating farmers should be noted in all reports in order to monitor the effectiveness of the CSP in reaching women farmers.

The quality indicator for the PPVT's is a summary measure of the average percent gain in yield for each year, for each cereal grain and for the several cereal grains taken together, for various land types, and for all of the land types taken together. The existing Contract Completion Report provides all of the data on individual trials that are needed for the calculation of such averages, but does not provide the averages.* The team met with Bishnu Raj Kafle, cropping systems specialist for the PCO, and together with him worked out a methodology for summarizing the data in the report, by 10 land types that he proposed. The methodology is summarized in annex C. Mr. Kafle believes that the job of summarizing the data will take him only a few hours. For the interim, Mr. Kafle ventured the guess that the average yield gain may have been in the neighborhood of 40-50 percent.

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* This is an unfortunate example of how an extremely thorough and carefully-written report may nevertheless fail to provide managers with the summary information that it needs--in the form of a few words and numbers--in order to know what is actually going on. In general, the team felt that it is management's responsibility to make clear to the authors of special reports the need for summary measures that can serve as a distillation of the findings of the entire report--for the benefit of present or future managers who will not have time to read the report, or who need to be able to explain the essence of the report to others.

2. **Indicators for Block Production**

The quantity indicators for block production are readily available: they are the number of hectares in block production, the number of panchayats covered by block production, and the percentage of panchayats covered by block production. In the future, it is recommended that the gender of participating farmers be noted. In the Rapti Zone, 17 panchayats, or about 7 percent of the total, are currently covered by block production. The number of panchayats covered by similar programs in the RCUP can easily be calculated. In many respects, the number of panchayats covered is a more useful measure than the number of hectares covered, because the presence of production blocks presumably exercises a powerful demonstration effect on farmers in the same panchayat, but not on farmers in distant panchayats.

The quality indicator for block production is the average yield gain, broken down in the same way as for PPVT's. Considerable interest attaches to the estimate of the average yield gain in block production, in view of concern that the gain is probably substantially less than that for the PPVT's--due to occasional unavailability of fertilizer, occasional poor quality seed, and less intensive supervision by extension agents. The methodology for estimating the gain is similar to that for the gain in the PPVT's, and is discussed in annex C.

For the Rapti Zone, raw data on yields in the production blocks are available in the Contract Completion Report. Mr. Kafle believes that the work of summarizing the data will take him only a few hours. The only difficulty in estimating yield gains for the production blocks in the Rapti Zone is some uncertainty as to the appropriate baseline measure. The team recommends that Mr. Kafle and others concerned with CSP data experiment with several approaches to this problem (described in Annex C), so as to provide managers with the best feasible measure of yields gains from block production.

3. Indicators of Demonstration Effects

In many respects the most critical linkage of the CSP approach, and the most difficult one to measure, is the demonstration effect on neighboring farmers, that is, the rate of spontaneous adoption of the new methods by farmers outside the block production program, in terms of the percentage of hectares planted with improved seed, for each crop, before and after the introduction of block production.

The team found two methods that could be used to measure the demonstration effect.

One method would be simply to follow HMG data on the number of hectares of each crop planted with improved seed. The data are available at the district level, and may be available at the panchayat level as well in the offices of Agricultural Development Officers (ADO's). One problem with this method is that it is not clear how the ADO's collect their measures of hectares planted with

improved seed. Another problem is that the existence of annual targets for each ADO for hectares planted with improved seed--which are usually met in each district--may compromise to some extent the usefulness of this measure for monitoring purposes.

The team concluded that a preferable source of data on the demonstration effect would be a small-scale survey of some of the panchayats in which the block production program had been operating for over a year. There are only 10 such panchayats in the Rapti Zone. Depending on the cost of the survey, it may be appropriate to sample only 5 or so panchayats, or it may be feasible to survey all of the panchayats in which the block production program has been operating for over a year.

Two methods should be considered for the survey. The judgement as to which method to choose should be made in consultation with persons who have a broad familiarity with survey techniques in Nepal, and with persons who are familiar with the reliability of the Key Informant Survey. Whichever method is selected, the surveys should be repeated at regular intervals, say every two years.

a. The simplest, and least expensive method would be to repeat the key informant survey that was taken at the time that the panchayat was initially chosen for PPVT's.

b. The more thorough method would be to select a sample of households in each panchayat. The survey would have to be designed by a local consulting firm. It is the team's impression that the cost of taking the survey once in 5 panchayats would be under $10,000, perhaps well under $10,000. The consulting firm would have the responsibility for designing the sample and the questionnaire, with input from USAID, and for tabulating and summarizing the results. The following discussion of sampling methods and of the contents of the questionnaire is intended to be merely illustrative of the kind of thing that the firm might design.

The sample could be selected from voters' lists for the panchayat. Stratification of the sample by size of holdings (with large farmers selected at higher rates than small farmers), and by participation and nonparticipation in the block production program, would improve the reliability of the estimates. In order to keep costs down, the sample should be fairly small--perhaps 60 to 100 households per panchayat. Although the standard error for estimates from such a small sample is fairly high, it is nevertheless small relative to the kind of effects that are being measured.

The questionnaire for the survey could to some extent be excerpted from that for the Key Informant Survey (the questionnaire for the latter survey is included in the Contract Completion Report). The questionnaire for the survey should, however, be much briefer than that for the Key Informant Survey, because many farmers

will not have the patience to answer a long questionnaire. Key questions would include the farmer's gender, current cropping patterns, the farmer's measure of his own yield, the availability of irrigation, the use of improved seed, the use of fertilizer, the availability of improved seed, the use of fertilizer, the availability or nonavailability of fertilizer when needed, the availability and use of credit, and a series of historical questions regarding former cropping patterns, yields, and availability of water, and former use of improved seed and fertilizer in the years before the block production program was introduced in the panchayat. USAID managers may wish to add questions regarding farmers' perceptions of the block production program, and other questions that will help them to monitor and evaluate the demonstrate effect of block production.

B. Specific Indicators for the Monitoring of Performance in Regard to AIC Inputs

Inasmuch as the availability of proper seed and fertilizer is critical to farmers' willingness to adopt the new agricultural practices, the team proposes that a modest effort be made to monitor the timely availability of good quality fertilizer and seed. The parastatal Agricultural Inputs Corporation (AIC) is the sole wholesale distributor in Nepal for commercial fertilizer, and is a major distributor for improved seed. The other major source for improved seed is local farmers who save seed from crops that they grow from improved seed.

1. Fertilizer.--In the Rapti Zone, the team heard frequent commments to the effect that a major stumbling block to the spread of improved varieties was that the right fertilizer was often not available at the right time to farmers who are planting improved seed.

The team proposes that ADO's in each district, of each project, monitor the availability of fertilizer by using available records as follows. Junior technicians (JT's) already keep records for each farmer in the block production program. The records show the number of hectares planted by each farmer, and the amount of fertilizer applied. The JT's could easily run through their records, and tabulate, for each farmer, whether he or she used any fertilizer, and whether he or she used the recommended amount.* The

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* The JT in Sallyan showed us his records for block production programs in his district. The team learned from these records that, in one panchayat in the Sallyan district, half of the farmers in the block production program for wheat got no fertilizer at all last fall. The JT explained that a local contractor failed to fulfill his commitment to deliver the fertilizer, presumably on porters' backs, by the promised date.

percentage of hectares in the program on which no fertilizer was used would serve as a "red-flag" indicator of the possible unavailability of fertilizer, at the proper time, in support of the CSP. In cases where a large percentage of farmers in the block production program used no fertilizer, the ADO for the district could be asked to report whether unavailability of fertilizer was the problem. The percentage of hectares on which insufficent fertilizer was used would serve as an indicator of the extent to which farmers followed recommended practices. For the Rapti Zone, the zonal agricultural office can readily summarize the data twice a year, once for the winter crop and once for the summer crops, for each panchayat in the program. The indicators will be of interest to AIC, the PCO, and to the AID mission.

b. Seed.--On one occasion, the team heard reports that substantial quantities of seed supplied by AIC had failed to germinate, or had germinated at very low rates. The team recommends that spot checks be made from time to time with farmers, to learn whether the problem is widespread, and whether it is continuing.

C. Contextual Indicators

Although the Cropping Systems program is currently operating only in a limited number of panchayats, both projects have had an interest in the possibility of increasing agricultural productivity throughout their areas. For this reason, managers should monitor two kinds of contextual indicators for the production of cereal grains, which are the major crops, and the ones for which data are most easily summarized.

1. Aggregate Production

Measures of production for each cereal gain, in tons, are prepared annually by the Agricultural Statistics Division of the Department of Food and Agricultural Marketing Services. A compendium of the measures is published every five or so years.*

The team recommends that the mission monitor these reports, and maintain regular contact with officials in the Division who can supply the Mission with the estimates each year as soon as they are available for release.

For the purpose of summarization, the team recommends that the Rapti project managers monitor the aggregate production of all cereal grains combined for the Rapti Zone, and the subtotals for Dang, and for the hill districts combined. (Dang accounts for about 60 percent of the zonal total.) Records of production

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* Agricultural Statistics of Nepal, 1983, is the most recent compendium.

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measures for each crop and each district should also be monitored by the mission, but it is to be expected that managers will be mainly interested in the summary measures.

For RCU, the choice of a suitable summary measure is more difficult, inasmuch as the statistics published by the Division are broken down by District, not by catchment area, whereas RCU includes catchment areas that include parts of several districts. Nevertheless, RCU managers will probably want to monitor aggregate cereal grain production in each of the districts in which the catchment areas are located.

The team's impressions in the field generally agreed with the conclusions of the recent FAO Food Security Mission--namely, that the production data give a good indication of trends in average yields per hectare, but that they may somewhat understate the increase in production, because they tend to understate the extension of cultivation into marginal areas, such as those on steep slopes in remote areas. Inasmuch as productivity per hectare on such plots may be presumed to be low, the understatement of the increase in production is presumably not very great. *

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* Because the measure of production of cereal grains is a comprehensive measure of great significance for monitoring the well-being of farmers in each District, it is important for project managers to understand its strengths and weaknesses.

For each district and for each crop, the measure is computed as the product of area cultivated and a measure of average yield.

On the whole, the team concurs with the view that the measure of average yield probably provides a useful indicator of trends in yields, although it may misstate the average level of yields. For many districts, the measure of yield appears to be based on crop-cuttings. For example, the team was told in Dang, Sallyan, and Gorkha districts that crop-cuttings underlie the measure of yield. For Dang, the number of cuttings was said to be 40, and for Sallyan it was said to be about 60-80. It is not exactly clear how the plots for crop-cutting are selected, but it appears that the same plots are used year after year. For some of the more remote districts, however, it appears that crop-cuttings are not taken, for lack of trained personnel. For such districts, yield estimates may be based on the judgements of key informants.

The measure of area cultivated for each crop appears to be the weakest component of the production estimates. The team heard this view expressed in the field, and noted that the FAO Food Security Mission expressed the same view. The problem is that the areal measures are based on outdated cadastral surveys for some districts, and on no surveys at all for other districts. Because of the pressure of population in Nepal, the team heard the view that the actual area under cultivation has probably increased somewhat more than the estimated area. However, inasmuch as all good land in Nepal has been under cultivation for some time, the productivity of the newly-cultivated land is probably quite low.

The measure of production of cereal grains combined has been quite flat for at least the past 8 years, for the Rapti Zone, and indeed for most of Nepal. In interviews in the Rapti Zone, several officials told the team that their impression was that production had indeed been stagnant outside the Cropping System areas, which cover no more than about 1 percent of the cultivated area.

The team proposes that the measure of cereal grain production be treated as a contextual indicator that will keep project managers informed as to how the situation is developing in the Rapti Zone, and in the several districts in which the RCU catchment areas are located. Although the original Rapti Zone project paper proposed a target of a 27 percent increase in the production of field crops in 5 years, as measured by the Agricultural Statistics Division, the team does not believe that the measure of cereal grain production is an appropriate measure of the impact of the project, for two reasons.

First, rapid increases in yields per hectare of the magnitude implied by the target have never taken place in modern Nepalese history. and are not taking place at present elsewhere in Nepal. Second, the modest expenditures of the project for agricultural extension work and agriculture credit are in no way commensurate with the magnitude of the problem of raising agricultural production in a zone of 800,000 inhabitants. Although it is difficult exactly to measure AID's contribution to field-crop programs in either project, the contribution does not appear to be large. For the Nepali fiscal year 1984-85, the budgeted contribution in the field appears to be no more than about $250,000.*

2. Potential Gains in Agricultural Production

For the purpose of monitoring their progress and plotting strategy for project extensions, managers need rough measures of what kind of production gains are feasible in the context of Nepal, and, more specifically, of the project areas.

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* The estimate is based on the amount of AID funds, in rupees, approved for reimbursement for agricultural extension and credit programs. Inasmuch as a substantial proportion of loans under credit programs are for purposes other than field crops, the estimate is an overstatement. The estimate does not include expenditures for irrigation projects, which impacted on very small areas, nor does it include technical assistance and the cost of construction of service centers for agricultural extension work.

In the Rapti Zone, the team heard several officials express the view that, if all the farmers in the Zone were to adopt the methods used in block production, the total increase in production would be in the neighborhood of 15-25 percent. They also expressed the view that larger breakthroughs in agricultural production could not take place without widespread additional irrigation, which, they conceded, would be extremely expensive.

Inasmuch as the task of merely extending the methods used in block production to all of the zone's farmers is a Herculean one--given the region's backwardness and the lack of roads--the prospects for gains in agricultural production in the zone may be quite modest. In order to have a surer grasp of this issue, the team recommends that the mission develop rough, order-of-magnitude measures of what kind of gains in agricultural production are possible in the project areas from a range of available methods--improved seeds, commercial fertilizers, improved cultivation practices, more intensive cropping, and modestly-priced irrigation projects.

The team's impression is that for the purpose at hand there is no need for a large-scale study, inasmuch as what is called for here is mature judgement, rather than elaborate calculation. Accordingly, the team suggests that mission experts in RD and ARC first exploit to the fullest extent possible information in the Canadian Land Use and Land Capability Maps, CSP data, and the judgement of agricultural officers working in project areas as to what is feasible.

D. Summary

The team proposes that managers monitor achievements of the Cropping Systems Program (CSP) at three levels: pre-production verification trials (PPVT's), block production, and the demonstration effect of block production.

-For PPVT's, the major quantity indicator of achievement will be the number of running trials, and the quality indicator will be the average yield gain for those trials.

-For block production, the major quantity indicator of achievement will be the number of panchayats in which block production programs are taking place, and the quality indicator will be a measure of the average gain for plots in the program.

-For the demonstration effect, the indicator of achievement will be a survey-based measure, in panchayats with block production programs, of the rate of adoption of the new seed varieties by farmers who are not participating in the program.

The team recommends that managers monitor as well the availability of fertilizer to farmers participating in the block production program, and carry out spot checks, on a rapid appraisal basis, of the quality of seed received by farmers in the program.

Two kinds of contextual indicators will help managers to evaluate the overall situation in project areas and to develop realistic strategies. One is a summary measure of cereal grain production, which is available at the district level. The other is a set of judgemental estimates as to gains in agricultural production that could be expected to occur in project areas, given a variety of locally feasible changes in agricultural practices.

VI: Livestock

It is livestock--principally cattle and buffaloes but also goats and sheep--that knit together the economy of Nepal's hills. They transfer crop residues, grasses, and leaves into manure to fertilize crop land. They produce the major source of cash income for many hill farmers. They supply motive power to work the fields and they produce, in the forms of milk and meat, a significant nutritional supplement to Nepali diets.

As key actors in the drama of survival it is not therefore surprising that livestock impinge most directly and most disastrously on the fragile environment of the RCU and Rapti project areas. In the hills, livestock rely on supplementing crop residues and cropland area fodder with fodderleaves and grasses from forest or range/pasture lands. In the hills, demand for fodder from forest lands is several times the demands for fuel or timber.* Much household time is spent collecting fodder and this time has markedly increased over the past decade. Fodder scarcity leads to overgrazing, the setting of fires to clear relatively undesirable bush species, and an especially severe pressure on the poor--who are without their own fodder trees--to overexploit the most fragile slopes in their struggle to survive.

Both the RCU and Rapti projects contain livestock components that aim, first, to increase livestock productivity and thus household income, and second, to increase fodder production as a necessity in increasing livestock productivity and as an element in the effort to relieve the pressure on the soil and water of Nepal caused by deforestation. Indicators of impact, therefore, would examine both household income increases from increased livestock productivity, and a reduction in pressure on the soil from increased fodder production and the consequent reduction in overgrazing and overcutting of trees and grass. Unfortunately, however, data on livestock numbers, livestock productivity, and fodder production are scarce, and simply unavailable as a time series. There is no HMG program to regularly estimate such data as there is with crop production data, and surveys that have been done are not comparable with each other.

The most important indicators of livestock activities therefore, will be monitoring indicators that track the delivery of services to farmers and the aggregate performance of fodder

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* See Wyatt Smith, J., "The Agricultural System in the Hills of Nepal," 1982, APROSC.

production programs. Thus the following classes of livestock indicators are suggested:

A. performance of fodder programs; and
B. delivery of services to farmers.

A. Indicators of Performance of Fodder Programs

The RCU and Rapti projects contain a number of activities that directly aim to increase fodder availability to livestock: including promotion of seasonal forage on cultivated lands, private planting of fodder trees, improvements in management of rangelands and pastures, stall feeding, and the more efficient use of crop residues and grasses through haymaking and silage. At least one activity of both projects may decrease a source of fodder--that is the conversion of grazing lands to forest lands. Unfortunately, neither project is in a position to estimate either the progress of any of these programs or their cumulative impact on fodder availability.

Furthermore, there exist for neither project any estimates of fodder needs that could serve as a benchmark against which to measure project achievements. It is therefore suggested that for each district or watershed an indicative fodder balance be prepared: for one adult ruminant the annual kilograms of fodder obtained from croplands and forest/grazing lands and the annual shortfall (difference between ideal needs of a healthy, productive animal and actual consumption.)* These indicative fodder "shortfalls" can then serve as targets when multiplied by estimated ruminant population in the districts or watersheds.

One pitfall of this approach that must be borne in mind is that fodder production increases may not be distributed evenly among the population because fodder production and livestock production programs tend to favor the larger farmers. Thus it is conceivable that, while fodder production could significantly increase, these increases might be consumed by more productive improved breeds owned by larger farmers, while the situation of the small and landless farmer would not improve at all. Under such a scenario there would be no relaxation of livestock pressure against the forests.

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* Work in the Phewa Tal watershed can provide reasonable estimates for most project areas (excepting Dang) in the absence of data specifically from RCU or Rapti areas. See S.G. Sharma, "Animal Husbandry and Feed Resource Management in the Phewa Tal Project," Chapter 5.

The components of fodder supply that should be measured include the following:

1. Increased leaf fodder from private planting:number seedlings distributed x percent survival x kilogram fodder units per tree per year at maturity, for each species.

2. Increased leaf fodder from forest plantations: number seedlings planted x percent survival x kilogram fodder units per tree per year at maturity, for each species.

3. Increased forage crop production: number of hectares in forage crop x kg/ha. At least at present, with small areas under forage crops (a new concept in project areas, livestock officers know hectarage reasonably well.

4. Increased grass production from managed range, pasture, and forest lands. This should be estimated net of reduced fodder from restriction of grazing.

5. Changes in crop residue production because of cropping pattern and crop variety changes. This can be estimated for the Rapti Project on the basis of the results of the agricultural survey on spread of new cropping systems discussed in the agriculture section of this report and for the RCUP on the basis of agricultural statistics on the spread of new crop varieties.

B. Indicators of Delivery of Services to Farmers.

There are three aspects of the work of line agencies that need particular monitoring attention: credit for livestock purchase, introduction of improved breeds, and fodder-related extension and nursery services.

1. Number of livestock, by species and whether improved or not, financed by credit programs: ADB/N, SFDP, and PCRW, by gender of farmer and by district in the Rapti Project only. Sample survey of all members in 20 percent of SFDP and PCRW groups to determine changes in household income, fodder collection times, and fodder sources as a result of livestock purchases.

2. Number of improved milk (cattle and buffalo) and meat (goats) producers (adjusted for survival) as a result of Livestock Department introduction of improved breeding stock or improved herds, by gender of farmers and by district or watershed. This information is available from livestock records at the service center and district levels.

3. Fraction of time JTs and JTAs spend on fodder-related extension, including distribution of fodder tree seedlings, by gender of contact person. This information can come directly out of the suggested indicator for geographic coverage of extension workers discussed in Chapter III, and would be compiled by the JTs themselves based on their already existing records

VII: Non-Agricultural Income Generation And Rural Credit

This component has a significant role in the Rapti Project but is now virtually absent from RCUP. No indicators suggested for this component need to be included in the RCUP monitoring and evaluation plan.

Rapti Project activities that aim specifically to increase non-agricultural income are training, credit, inputs supply, marketing, extension, group formation, appropriate technology development, and use of local contractors in construction and maintenance. The most important government programs through which these activities are carried out are the Cottage Industries Board and C.I. Emporium (training, inputs supply, marketing); the Small Farmer Development Project (training, credit extension, group formation); the Production Credit for Rural Women Program, and the Household Production Systems Program. For the development of indicators, this discussion and this report's recommendations will focus on the activities of the Cottage Industries Board (CIB) and the Agricultural Development Bank's (ADB/N) Small Farmer Development Project (SFDP) with some consideration of the Appropriate Technology Unit (ATU).*

Types of indicators useful in monitoring and evaluating non-agricultural income generation are the following:

A. Impact indicators for training and new enterprise establishment;
B. Monitoring indicators that focus on performance of credit schemes; and
C. Monitoring indicators that focus on group formation and performance.

A. Impact Indicators for Training and new Enterprise Establishment.

The SFDP and CIB have trained hundreds of rural people in skills ranging from hosiery knitting to beehive making. It is important that training impact indicators be developed to both evaluate training programs and to monitor complementary needs such as credit or marketing. Having heard reports that

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* Both projects have historically provided support to the regular credit programs of the ADB/N but this support has been terminated. Therefore, experience with these credit programs (much larger than SFDP, for example) is not considered further in this report.

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trainees, in at least some cases, made no use of their training, the team recommends that particular attention be paid to this issue. A rapid appraisal survey of about 20 percent of trainees is suggested to follow-up their experiences after receiving training. This survey can be focussed on the more accessible trainees, and only those residing within Rapti Zone.

1. Estimate of income increases as a result of project-related activities (including training), based on trainee recall in follow-up survey, by type of training and gender of trainee. The survey should also determine whether trainee has received a production loan and is self or wage-employed, because it was the team's observation that at least some trainees were unable to set up in business for themselves (for many reasons) and became sweatshop workers for a local established businessman--at piecework rates below even the daily wage for unskilled construction workers.

A second impact of the Rapti Project that can be estimated is the creation of new businesses as a result of project assistance. The indicator here is number of businesses by type together with number of employees and job displacement. Examples of businesses started are: Rukum chiuri processing plant, Tulsipur Engineering Works, Bishwakarma Furniture Works, 25 turbine-driven mills, woodstove potter groups, woodstove stores (3), and a number of textile and hosiery businesses. Most of these businesses have a positive net impact on rural employment and incomes although this may not be the case for the turbine-driven mills, which displace traditional forms of labor-intensive milling.

2. Number of employees and job displacement (jobs lost in other businesses as a result of the new establishment) by type of business and by gender of owner, employees, and workers losing jobs.

B. Indicators of Credit Scheme Performance.

Although the Nepal Bank Ltd. will make some PCRW loans under its intensity banking scheme, by far the most important institutional credit source is the ADB/N. It is suggested that performance of its SFDP credit program be monitored through use of the following indicators:

1. Number of panchayat with ADB/N units in the form of SFDP offices and number of groups in each panchayat.

2. Number of loans, by type of loan and gender of recipient.

3. Amount of loans, by type of loan and gender of recipient.

4. SFDP offices classified by performance in terms of:

   a. size (total loans made in preceding year);
   b. number of groups served;
   c. percent of loans to women;
   d. profitability of office;
   e. rate of expansion, and;
   f. savings mobilization.

5. Repayment experience, as percent of outstanding loans past due, by type of loan and gender of recipient.

6. Number of existing activities expanded by borrowers or new activities initiated, by type of loan and gender of recipient.

C. Indicators of Group Formation and Performance.

A key to the success of the SFDP and PCRW projects is group formation to increase the access of small farmers and women to credit, and to increase these previously neglected groups' involvement in development. If the SFDP and PCRW groups are merely paper lists of names to which credit can be given, they will not be fulfilling their potential in development.

Periodic rapid appraisal of SFDP groups are suggested, along the lines of that performed by Philhower and Shrestha in May 1984, but with more attention to how the groups actually function as groups.

1. Number of groups, number of women's groups (in SFD), number of women in mixed groups, and number of panchayats with groups, by district.

2. Principal activities of groups; e.g., inputs supply, marketing, production, joint ownership of machinery, emergency loan funds, savings, mobilization for social projects.

3. Qualitative rating of groups based on organizational effectiveness: number of meetings, attendance at meetings by gender, decision making procedures, group initiative in social community programs, satisfaction of members with group.

VIII: Women

Project Extension Papers for both the RCU and Rapti projects implicitly recognize that "women in Nepal have traditionally made many of the decisions on resource use and conservation at the family level," that "women in Nepal contribute more than half of the labor to the farm endeavors, "that women make the stove and cooking decisions, and that women are "the local experts in matters of wood use."* The extension papers for both projects include modest new components focussing specifically on women.

The objectives of Women Development Officer (WDO), Production Credit for Rural Women (PCRW), and other project activities that target women are to increase household income by drawing women into the market economy; to increase women's knowledge of new agriculture, forestry, livestock and cooking technologies and systems, and to mobilize the resources of women "to establish self-reliant groups of village women who are organized to articulate their own priorities and know how to make the government machinery work for them and then to use these groups as an entry point for initiating a broad range of services benefiting women and their children."**

To accomplish these objectives the Rapti Project aims to train more women, channel more production credit to women, and organize women into effective groups. Given the importance of this component, the trial nature of the WDO and PCRW programs, and the small number of women being reached, it is suggested that impacts on women be ascertained through surveys of all women's groups.

The RCUP specifically targets women through training support to the two WDO's, through women's stipends at IRNR, and through a small kitchen garden program. Total financial contribution is insignificant. In addition, the stove program directly impacts women although it is organized and run by men and only men receive cash income through its operation. Therefore most project impacts on women occur through regular programs, such as, seedling distribution, training, and extension, and it is therefore necessary to collect all data on a gender specific basis in order to monitor women's involvement in the process of development and women's participation in project activities.

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* Quotes from Marilyn Hoskins, "Strategies for Involving Women in RCUP Activities and Benefits," 1982, and Carol Cooper and Debra Davidson, "Women and Resource Conservation and Utilization in Nepal," 1983.

** See page 10 of Chandni Joshi, Rural Women and Income Generating Activities," 1984.

The following three indicators are suggested for the Rapti Project--only the last two for RCUP given its relative lack of attention to programs focussed specifically on women.

A. Impact of WDO, PCRW, and SFDP;
B. monitoring of progress in formally including women in the development process; and
C. monitoring women's participation in rural works and community forestry programs.

A. Indicators of Impact of WDO, PCRW, and SFDP

There are few women's groups now existing in the Rapti Project area and, given the critical nature of this component of both projects, it is worthwhile to carefully measure impact on women of group formation for all women's groups in order to see differences among groups. An annual survey (designed, conducted, and analyzed exclusively by women) is required. Much of the data required for indicators 1. and 2. can come directly from records the WDO's already keep.

1. Average household income increase that is a result of the training, credit, or group formation activities of the projects, by district or watershed.

2. Number of major household decisions affected by project-related activities; such as, latrine construction, improved stove installation, fodder tree planting, or stall feeding, when the women of the household felt that she made the decision.

3. Qualitative assessment of each women's group's cohesiveness and ability to function as a group, with particular attention paid to number of activities carried out, frequency of and attendance at meetings, how decisions are made, women's identification with the group, and outsiders' perceptions of the group.

B. Indicators of Progress in Formally including Women in the Development Process

Data for indicators 1. and 2. can come from PCO or SECID records, for indicator 3. from nursery records of distribution to private farmers, for indicator 4. ADB/N records on SFDP and WDO records on PCRW, and for indicator 5. from the survey of JT and JTA geographic coverage disaggregated by gender of contact person.

1. Number of women staff associated with the projects, at all levels in all line agencies, including expatriates, consultants, and AAs, by level.

2. Number of women trained, by level, and type of training.
3. Number of women receiving seedlings from departmental nurseries.
4. Number of women given credit through project programs, for Rapti Project only.
5. Number of women directly reached by extension workers, as a percentage of number of contacts made.

C. Indicators of Women's Participation in Rural Works, Soil Conservation, and Community Forestry Programs.

These indicators are directly derivable from the "peoples' participation" indicators discussed under institutional development. Interest focusses basically on number of women involved--in a meaningful way--in planning, designing, constructing, and maintaining rural works and community forestry projects. Because many women are used as (often unpaid) laborers on these projects, women's construction contributions should be split out.

1. Percentage of people participating in rural works, soil conservation, and community forestry projects who are women, by type of project (e.g., DWS, trail improvement, PPF management, etc.) and by construction and non-construction participation.

IX: Soil Conservation

The protection of the environment is a major purpose of the RCUP, and is a secondary purpose of the Rapti Zone project. The protection of the environment involves, above all, the conservation of soil--by improved grazing practices, reforestation, improved farming practices, and physical construction of barriers to erosion. Many of the components of the RCUP are focused directly or indirectly on the protection of the environment, and it may be said that they are focused on soil conservation. In principle, therefore, an aggregate indicator of the amount of soil conservation attributable to all of these components could serve as a broad measure of the impact of the RCUP as a whole. In practice, however, data and methods are not available for measuring the contribution of most of the components such as improved grazing practices and reforestation to soil conservation. For this reason, the present chapter concentrates largely on indicators for the physical construction of barriers to erosion--built, in most instances, by the Department of Soil Conservation and Watershed Management (DSCWM). At the end of the chapter, there is a brief discussion of contextual indicators of the environmental health of the project areas.

A. Indicators of Impact for Construction Projects

In the RCU areas, streambank stabilization and gully control account for the largest share of expenditures for soil conservation construction projects. In the Rapti Zone, there are no streambank stabilization projects, and gully control accounts for the largest share of expenditures.

1. **Streambank Stabilization Projects**--A recent benefit-cost study done for SECID concluded that the major benefit of streambank stabilization projects was in the form of hectares of agricultural land protected.* Accordingly, the team proposes that RCU estimate for each streambank stabilization project the number of hectares of agricultural land protected. Such a measure can readily be summarized for several projects, giving an aggregate measure of hectares of agricultural land protected.

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* Section II, "Watershed Management," by W. Hyde, K. Kanel and V. Sainjo, in the benefit-cost study submitted to SECID on March 22, 1985 by Edward Vickery.

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2. **Gully Control.**--Gully control works financed by USAID are being completed at the rate of about two gullies per year in the Gorkha catchment area of RCU, and they are being completed at a slower rate in the Rapti Zone. DSCWM officials in both project areas believe that the major benefit of gully control is the prevention of mass wasting of debris from gullies into rivers. They appear to feel that protection of agricultural land is a secondary objective.

The team recommends that the projects encourage DSCWM to develop two measures for each gully control scheme: first, a measure of the contribution of the scheme to the control of mass wasting in the project areas, and second, a measure of the hectares of agricultural land protected by gully control schemes. The latter measure can easily be prepared by project engineers at the time that feasibility studies are undertaken. The former measure requires some further thought.

In considering the formulation of impact indicators for gully control, the team was struck by the difficulty of knowing whether the schemes being carried out were a drop in the bucket, or whether they in fact were having a substantial impact on soil erosion in the project areas. The question appeared particularly interesting in view of the substantial cost of gully control. Accordingly, the team proposes that the projects, particularly RCUP, give consideration to two alternative methods of measuring the contribution of a gully-control scheme to the control of mass wasting in the project areas: a crude, easily-constructed measure, and a more sophisticated, difficult-to-construct measure.

The crude measure would be constructed by preparing an inventory of all of the major gullies in a project area. Remote sensing may aid in the preparation of such an inventory, but DSCWM officials appear to feel that they already know where most of the major gullies are anyway. In the Gorkha catchment area, officials told the team that there were 20-35 major gullies. In the Rapti Zone, a figure of about 20 was suggested by one official. Such an inventory, if properly compiled, using standard criteria, would give managers some notion of the scope of the problem that they are attempting to control by means of a small number of gully scheme schemes.

The more sophisticated measure would involve assigning a measure of size to each gully. In the absence of a measure of size, there is no way of knowing how the gullies that a project has controlled compare in size with the gullies that have not been controlled. Accordingly, in the absence of a measure of size, it is difficult to say to what extent the project has made an impact on mass wasting from gullies in a region.

The measure of size of a gully might, for example, be hectares of barren ground at a slope that exceeds a certain standard. Such a measure might serve as a reasonable proxy for the amount of mass wasting that is taking place in a gully. It remains to be seen whether such measures could readily be assigned to major gullies by means of pictures from remote sensing, or by means of on-site photographs taken during site visits at opportune times.*

B. Contextual Indicators

The RCUP extension paper proposed using a measure of the percentage of "severely degraded" land, based on remote sensing, as an indicator of the environmental impact of soil conservation works.

Technicians assigned to the RCUP, and to the Remote Sensing Centre in Kathmandu, assured the team that it is entirely feasible to prepare a measure of the percentage of land that is severely degraded, as well as to prepare other measures of environmental health. The team encourages both projects to monitor such measures on a regular basis, as contextual indicators.

As regards the use of the measure of the percentage of "severely degraded" land as an impact indicator, the team reached two conclusions.

First, the team does not believe that the measure of the amount of "severely degraded" land can reasonably be considered an impact indicator for RCUP soil conservation works, at least until more is known about the scale of environmental degradation in relation to the scale of RCUP soil conservation works. Environmental degradation has been occuring on a massive scale in the hills of Nepal for some time, as a result of deforestation, the extension of cultivation, and overgrazing.

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* A variant on the idea of using photographs to measure gullies would be to use photographs to develop crude estimates of the rate of mass wasting at selected gullies. According to DSCWM officials, some gullies waste at rates that are quite alarming in a period of only two or three years.

RCU has decided that it is not worth the cost to perform expensive tests to measure erosion by means of traps constructed at the base of gullies. Perhaps a cruder, but much cheaper measure could be developed by means of before-and-after photographs. Even if such a measure were only accurate to within a factor of two, it would add substantially to our knowledge of the extent to which individual gullies contribute to the filling of Nepal's rivers with debris, Accordingly, it would help in developing a measure of the impact of a gully control project.

The team is sceptical whether a handful of soil conservation works can reasonably be expected to have a discernable impact on the process of environmental degradation.

Second, the measure of the percentage of "severely degraded" land could, in principle, serve as a broad indicator of the impact of several components of RCUP--including forestry, pasture management, and soil conservation. In practice, however, it is once again not clear whether the several components are yet operating at such a scale as to arrest the degradation of the environment. For example, forestry activities that are well along in terms of the production of seedlings, may not have reached such a stage in terms of the improvement of ground cover as to have a significant impact on soil erosion. Accordingly, the team does not recommend the use of the measure of the percentage of "severely degraded" land as a broad indicator of the impact of RCUP.

C. Summary

The team recommends two measures for the impact of soil conservation works: the number of hectares of agricultural land protected by streambed stabilization and gully control, and a measure of gully control accomplished as a percentage of large gullies in the project areas (in terms of number of gullies, or in terms of some convenient measure of the size of gullies).

The team recommends that the projects monitor the measure of percentage of "severely degraded" land, based on remote sensing, as a contextual indicator.

X: Rural Works

Both the RCU and Rapti projects include a series of project activities that may be labelled "rural works".* They are small-scale, non-building construction activities that--excepting a few medium-scale irrigation projects that fall under the Department of Irrigation and drinking water schemes that fall under the Department of Water Supply and Sanitation (RCUP only)--fall under the construction responsibility of the MPLD. They include drinking water schemes (DWS), minor irrigation schemes, suspension bridges (Rapti only), and trail and mule track improvement. In RCUP, trail improvement falls under DSCWM.

Beneficiary impact of these schemes varies depending upon the type of scheme. Major impacts are either time saved or, for irrigation, increased crop production. Because these schemes (especially drinking water supply (DWS) and irrigation) are very popular with local political leaders and (for DWS) with rural residents in general, it is imperative that indicators alert management to those characteristies of completed schemes that result in the greatest beneficial impact. Furthermore, because rural works projects are notoriously difficult to maintain once turned over to local control, it is essential that attention be directed to the mobilization of local capabilities to maintain schemes. Finally, and a closely related point, many more schemes could be completed and their effectiveness increased, if beneficiaries were willing to make a significant contribution to scheme construction and maintenance.

Rural works indicators are grouped into three categories as follows:

A. Beneficiary impact;
B. output monitoring; and
C. effectiveness of beneficiary organization.

A. Indicators of Beneficiary Impact

The major quantifiable indicator of impact for DWS, track and trail improvement, and suspension bridge schemes is time saved. DWS schemes also are designed to improve the quality of water consumed by users but quantification of this impact has been found to be exceedingly difficult even with expenditure of

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* The rural roads portion of the Rapti Project is currently the subject of special study and is therefore not covered in this report.

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substantial amounts of resources on impact studies. This is at least partly because water quality is only one of several interrelated factors, certainly including nutrition and sanitation, that must be improved before any of them can begin to realize their potential impact. Clean water is necessary but not sufficient for major health impacts.

Because each rural works project requires feasibility and design studies, data on time savings are easily available as "distance to old source in minutes" or trail time saved with new bridge or other improvements. Population served and cost data are also available from feasibility studies and PCO or SECID records.

Thus impact indicators for DWS, track and trail improvement, and suspension bridge schemes are:

1. Distance to old source (min.) x population served. For schemes where this indicator is relatively low, then a qualitative justification of the scheme may be given; for example, in the case of Marpha, Mustang District, because the old water source was a heavily polluted canal running the length of the village.

To rank schemes on cost effectiveness:

2. Distance to old source (min.) x population served divided by cost.*

Irrigation schemes are, properly speaking, agricultural development schemes and are placed in a "rural works" category only because their construction can most effectively be organized under the MPLD. Impact is the increase in agricultural production. To measure such impact it is suggested that the same procedure be used (based on low-cost sample surveys as a follow-up to block production results) as is discussed in detail under the agriculture component. (See Chapter V, Section A-3.) Indicators are:

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* This indicator was calculated for each of eleven DWS schemes in Gorkha District of the RCU Project and the ranking of the schemes thus obtained was compared to that from the RCUP B/C study. The differences in ranking were minor, despite the fact that the B/C study used a considerably more complex estimation of actual consumer time savings. See the March 1985 draft Benefit/Cost Study of Drinking Water for the RCUP.

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3. Sample-based estimates of production increases (in food-grain equivalents) for irrigation schemes in each district or watershed area, in MT/ha. In the absence of a survey, a proxy is the increase in irrigated area.

B. Indicators of Project Delivery of Outputs.

This class of indicators is suggested to monitor progress in scheme implementation and to identify trouble spots early enough so that corrective action can be effectively instituted.

1. Number of approvals, number of completions, and number of operating systems, by type of scheme and district or watershed. These data are available in the PCO or at SECID.

2. Cost per hectare for irrigation, cost per person served for DWS, and cost per kilometer for trail and track improvement, for each scheme. These data are also available in the PCO or at SECID.

3. For DWS schemes, spot checking as part of other project visits to scheme villages, should be made to monitor percent of taps functioning.*

4. For irrigation schemes, spot checking, as part of other project visits to scheme villages, should be made to monitor percent of target hectares actually being irrigated.

C. Indicators of the Effectiveness of Beneficiary Organization

Neither HMG nor USAID can forever retain responsibility for drinking water, minor irrigation, or trail improvement schemes. Decentralization and its concomitant requirements for increased local contribution of labor in construction of rural works schemes will help to shift the locus of responsibility at least to the district level. Local contributions as a percent of total scheme cost are monitored under the institutional development component (See Chapter III.)

In addition, however, local groups of beneficiaries will need to take responsibility for maintenance of completed works, something that has not happened in most schemes to date. Therefore, it is suggested that annual rapid appraisal of users' groups be made to measure qualitatively their effectiveness as maintenance organizations. This information is a supplement to, and can be collected at the same time as, that included under institutional development.

1. The indicator to be used is a qualitative measure of effective local participation in scheme maintenance.

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* A good example of such monitoring is provided by the Rapti Project "Drinking Water Systems Evaluation Report" prepared by PCO's Planning, Monitoring and Evaluation Unit, Tulsipur, 1985.

XI: Conclusions and Recommendations

A. Conclusions

1. The data collection, monitoring, and evaluation plans contained in the RCU and Rapti projects' PEPs are good starting points from which to establish useful M&E systems. The team's recommendations should be viewed as refinements to these already-existing plans.

2. The Rapti and RCU projects as well as HMG line agencies have instituted extensive data gathering and reporting systems. These systems emphasize financial and physical-target data much of which can form the basis for the needed monitoring and impact assessment systems.

3. Data at the field level (that is, data kept in the records of extension staff or district offices) exhibit several characteristics that diminish their utility:

i) they are often not systematically and regularly kept,

ii) they are often not uniform across stations or over time,

iii) they often omit details that would significantly enhance their value,

iv) they are often not aggregated so as to be most useful, and

v) they are often transmitted to higher levels with the loss of valuable information.

4. Nevertheless, in spite of these shortcomings of currently existing data and of data collection systems, they represent an enormous effort <u>already made</u> in the development of monitoring and impact assessment systems and they can yield exceedingly valuable information.

5. Periodic reports received by AID/N from field offices primarily contain semi-processed data relating to accomplishment of HMG targets. They are of less use to managers in assessing how well work is progressing and what impact it is having than is possible and desirable. Exceptions are RCU status reports on construction schemes and both projects' data on financial releases which are utilized in an effective manner.

6. Both projects have produced bookshelves worth of consultants' reports on nearly all aspects of the projects. Each report is done independently, is organized independently, and is devoid of summary indicators that permit comparison with other reports or

surveys. Such reports are especially baffling to a new manager. The baseline surveys for both projects lack any type of rapid and summary follow-up. They are of little use to managers of the projects, who need to know about changes in the regions since the surveys were taken 5 years ago.

7. The team has been impressed with the capability and dedication of field and AID/N staff charged with responsibility for the collection, processing, and analysis of monitoring data. The principal need is for clear direction, not staff augmentation.

8. There is a need for what this report calls "contextual indicators" to inform managers of the project background, of the magnitude of the tasks ahead, and of desirable re-thinking of strategy. Basic information like agricultural production, agricultural potential, nutritional status of population and livestock, and rate of environmental change is lacking at present in any shape or form that is intelligible to the non-specialist. Neither baseline survey nor "follow-up" consultant's reports yield summary contextual indicators.

9 There is a need for meaningful strategic targets to be developed that reflect both what is needed and what is possible and that are cast in terms of desirable impact flows rather than in terms of stocks built-up. For example, forest plantation targets need to emphasize the product of nursery output and survival rate as a measure of the putting in place of the capacity to plant seedlings over the long term. There is then a need for impact indicators that can be related to these realistic targets rather than to vague and grandiose targets such as a 27% increase in agricultural production in Rapti Zone having no relation to either the scale of the overall project or to the need to build the capacity to deliver inputs rather than actually to deliver the inputs.

10. There is a need for monitoring indicators that track the performance of activities of the projects for which there is ground for concern: indicators that send up red flags as activities flounder and when management intervention is required.

11. Establishment of a data collection, monitoring, and evaluation system is but the first step in a <u>process</u>. It is not the creation of a static data information system. There is a need for <u>continual feedback from management to the data collection, monitoring, and evaluation system</u> to refine indicator definition as circumstances and information requirements change. Experience to date in both projects underlines the need for advance planning of management information systems.

C. Recommendations

The team's recommendations are a series of indicators grouped into eight thematic categories. Summary statements of key indicators follow

1. **Institutional Development.** Major indicators show buildings and staff development, increased effectiveness in delivery of outputs, and increased local participation.

2. **Forestry.** Major indicators show increases in the flow of surviving seedlings and qualitative and qauantitative measures of forest management.

3. **Agriculture.** Major indicators show the spread of new technologies and cropping systems in selected panchayats.

4. **Livestock.** Major indicators show aggregate changes in fodder supply in selected panchayats and monitor flows of credit, fodder extension service, and improved livestock to farmers.

5. **Non-agricultural Income Generation And Rural Credit.** Major indicators show effectiveness of training and credit programs.

6. **Women.** Major indicators show women's role in project staffing, the extent to which women receive services (credit, extension, agricultural inputs, and training) from line agencies, and the performance of women's groups.

7. **Soil and Water Conservation.** Major indicators show area of agricultural land protected and progress towards stabilization of critical erosion areas.

8. **Rural Works.** Major indicators show time saved by beneficiaries as a result of scheme construction and local assumption of maintenance responsibilities.

SCOPE OF WORK

ASSESSMENT AND REFINEMENT OF RCU AND RAPTI DATA COLLECTION, MONITORING AND EVALUATION PLANS

The Projects. The purpose of the Rapti Rural Area Development Project is to raise productivity and income in the Rapti Zone, located in Nepal's remote Mid-Western Region. Inputs in agriculture, renewable natural resources, infrastructure, credit, training, employment and skill generation address this objective. The project also strengthens local institutions and supports GON efforts to decentralize decision-making and implementation. The project agreement for Rapti Rural Area Development (Rapti) Project (No. 367-0129) was signed between AID and Government of Nepal (HMG) in July 1980 for a total of approximately $33. 7 million ($26.7 in U.S. grant funds and an HMG contribution equivalent to U.S. $7 million).

The purpose of the Resource Conservation and Utilizaton (RCU) Project is to attempt to halt the rapid degradation of Nepal's environment using methods including reforestation, better range management, alternative energy sources, and improvement of agricultural methods and watershed management. The project agreement (No. 367-0132) was signed between AID and the Government of Nepal (HMG) in August 1980 for a total of approximately $32.5 million ($27.5 in U.S. grants funds and a HMG contribution equivalent to U.S. $5 million). In February 1981, AID/W signed a five-year contract for technical services with the South-East Consortium for International Development (SECID). They agreed to provide HMG with advice on institutional development, soil, watershed and forestry conservation development and a revised Project Activity Completion Date was set for July 1985.

Purpose. The purpose of this consultancy is to: (1) assess the proposed data collection plans for RCUP and Rapti in order to: (a) see if they are designed to aid managers in effective decision-making by providing useful, relevant and timely information on the progress of the projects toward their stated goals and purposes, (b) determine whether the plans will provide relevant information on beneficiary impact; and (2) recommend possible modifications in the plans to increase the likelihood that they will provide effective monitoring of both projects and relevant impact information.

Timing. The evaluation will take place as soon as possible. Ideally, the team should depart by the end of April and no later than mid-May, 1985. The team will spend approximately 3-4 weeks in-country.

Questions The Evaluation Team Should Answer

1. Are the data to be collected relevant for monitoring progress toward goals and purposes of the projects? Will they be useful and timely in determining whether the project's inputs and outputs are being implemented as planned?

2. Are there other data relevant to the projects and the monitoring of progress that have been overlooked? Are there other data that may be more relevant and appropriate than those being gathered? If so, what type of data and how should this data be gathered, analyzed?

3. Is the nature of the data collection and analysis such that results can be fed back to managers in a timely fashion for decision-making and to guide project implementation? What procedures have been developed to facilitate and ensure this? Should anything be done to improve the feedback mechanisms?

4. Are the data to be gathered limited to only that needed for effective decision-making and assessment of impact? Is the design of the system simple enough that staff will be able to analyze all data gathered without employing overly complicated, time-consuming or costly methods of analysis?

5. Given local conditions are the data of reasonably high quality? Are the data collectors the most appropriate individuals to get reliable information? Are they reasonably well-trained? Are the methods and procedures employed to collect the data ones that will ensure some consistency?

6. Are local individuals sufficiently involved in the collection and analysis of the data to enhance accuracy in interpreting results?

7. Is there adequate attention being given to both quantitative and qualitative information in data collection, monitoring and evaluation plans?

8. Is data being collected on changes or impact - the intended beneficiaries may be experiencing as a result of project activities?

9. Will the results of any data analyses be available for use in 4th quarter FY 85 or 1st quarter FY 86 evaluations of these projects, to provide an empirical basis for assessing progress, change and/or impact? If not, can any steps be taken to ensure that some data analyses are completed in time for these evaluations?

10. What additional steps should USAID or AID/W do to enhance the relevancy, feasibility, and usefulness of the data collection plans?

11. Have any lessons concerning project data collection, monitoring and evaluation been learned that would be applicable for refining this system or in designing such systems for new projects?

Funding. Approximatley $20 thousand in PD&S funds has been approved for this evaluation.

Reporting Requirements

1. Format of the Report

The report will contain the Following sections:

-- Executive Summary (two pages, single spaced, including statement of purpose of the AID projects reviewed and of the evaluation);

-- Basic Project Identification Data Facesheet

-- Statement of Conclusions (short and succinct with topic identified by subhead) and recommendations (corresponding to conclusions and worded, whenever possible, to specify who, or which agency, should take recommended action);

-- Body of Report (which includes a description of the country context in which the project was developed and which provides the information on which the conclusions and recommendations were based); and

-- Appendices as necessary (including, minimally, the evaluation's scope of work and a description of the methodology used and, possibly, methodological recommendations for future evaluations).

Submission of Report

Approximately 48 hours prior to departure, a preliminary draft of the report is to be delivered to USAID/Nepal. A full final draft will be submitted to AID (with copies for HMG, RCUP and RAPTI) within one month of departure after Nepal. Both authors are responsible for seeing the report through to timely, professional-level of completion. Any comments that HMG, AID or SECID desire to make must be conveyed to the team in sufficient time to allow for their consideration in the final draft.

Debriefings

A debriefing will be held in the mission prior to finalizing the preliminary draft that is to be left with the mission. A second debriefing will be presented to AID/W by the two team members.

Methodology and Procedures

1. Duration of the Evaluation: The evaluation will take place over a period of three to four weeks in Nepal during which both consultants will be expected to work six-day weeks. They will spend approximately half their time in Kathmandu and half in rural areas and on-site visits. The consultants will also be expected upon return to spend the time necessary to prepare a finalized report.

2. General Methodology: The methodology to be used will involve a review of current data collection methods, existing data and the proposed plans. This will include interviewing local people, mission personnel and government officials.

3. Related Documents: Prior to departure, both consultants should be familiar with the RCU and Rapti project papers provided by AID/W as well as the draft paper, "Guidelines for Data Collection, Monitoring and Evaluation Plans for Asia Bureau Projects," provided by ASIA/DP/E. In Nepal, they should examine other data collection and analysis papers as time allows.

Annex B -- List of Persons Met

AID Mission in Kathmandu
Janet Ballantyne, Acting Director
George Lewis, Acting Deputy Director
Carl Dutto, Chief, RD Office
Jon Breslar, Project Manager, RD Office
Benjamin Stoner, Project Manager, RD Office
Gary Alex, Project Officer, ARC Office
George Taylor, Project Officer, ARC Office
Bert Levenson, Project Officer, ARC Office
Rick Handler, Acting Program Officer, PRM Office
Tri Ratna Tuladhar, Project Officer, PDIS Office
Barbara Spaid, Asst. Health and Family Planning Officer, HFP Office
Shaubhagya Lal Shrestha, Program Specialist, RD Office
Ashok Poudyal, Data System Analyst, PADCO/USAID
Batuk P. Upadhya, Forestry Institution Consultant, RD Office
Badri Nath Kayastha, Household Production Specialist, RD Office
Harsha M. Bajracharya, Engineer, RD Office
Niranjan Man Singh Regmi, Program Specialist, ARC Office
Bal Gopal Lal Singh Suwal, Program Specialist, Program Office
Paul Gurung, Engineer, PDIS Office

SECID

Lakman L. Rajbhandari, Project Coordinator
Dan Amos, Chief of Party
Rabindra Shrestha, Training Wing of Ministry of Forest and Soil Conservation
John Davenport, Project Engineer
Murari Aryal, Social Scientist
Narayan Gurung, Program & Budget Officer
Yadav R. Sharma, Assistant Program & Budget Officer
Mohan K. Wagley, Landuse Planner
Yam B. Malla, Extension Specialist

Other Kathmandu Offices

Michael B. Wallace, APROSC
Henry R. Stennett, Watershed Management Officer, Food and Agriculture Organization
Lakshman K. Gautam, Program Officer, FAO Representative's Office
K.B. Malla, Project Manager, Remote Sensing Center
Tom Wagner, Advisor, ERIM

Rapti Zone

Rabindra Rajbhandari, Zonal Manager, ADB/N, Tulsipur
Mitra Lal Upadhya, Acting Project Coordinator, Rapti IRD Project, Tulsipur
Heera Raj Regmi, Research and Evaluation Officer, Rapti IRD Project, Tulsipur
Puskar Gautam, Turbine Owner and Progressive Farmer, Halwar
Laxmeshwar Yadav, Agriculture Officer, AIC Zonal Office, Ghorahi
Yam Bahadur Mahara Chhetri, Progressive Farmer, Narayanpur
Satrughanna Prasad, J.T., Livestock Sub-center, Kapurkot
Ram Das Pandey, J.T., Agriculture Sub-center, Kapurkot
Hari Prasad Shrestha, Turbine Owner, Luham
Pahal Singh K.C., Overseer, Soil Conservation Office, Tulsipur
Ganga Prasad Luitel, Cottage Industry Officer, Salyan
Prabha Kumari Shrestha, Women Development Officer, Salyan
Dipendra Kumar Shrestha, J.T., Agriculture Office, Salyan
Ram Bahadur Shah, Pradhan Pancha, Amritpur Panchayat
Jim Roshetko, PCV Forestry, Salyan
Bob Luckel, PCV Forestry, Salyan
Mark A. Conley, Natural Resources Specialist, Rapti Project
Bishnu Raj Kafle, Cropping System Specialist, PADCO
Awadh Kishor Deo, Agriculture Development Officer, Ghorahi
Krishna K.C., Ag. Economist, PADCO
Ram Poudyal, District Forest Controller, Dang
Bhakti P. Thanet, Office Assistant, SFDP, Laxmipur
Manager, Nepal Bank Ltd., Salyan
Agricultural Junior Technician, Chorkate
Assistant Group Organizer, SFDP, Laxmipur

Gorkha District

Gopal Upadhya, Catchment Conservation Officer
B. Deepak Upadhya, District Forest Controller
Karna Bahadur Bohara, Veterinary Doctor
Thaneshwar Sharma, LDO
Bhanu Shrestha, WDO
Kamal Kishor Shrestha, Engineer
Purna Man Sakya, Agriculture Development Officer
Uma Nidhi Panday, Pradhan Pancha for Dhuwakot Panchayat

Plus many, many farmers, trainees, and business people from whom we learned so much.

Annex C--Methodology for Summarizing Cropping Systems Data

This annex deals with a methodology for summarizing data for pre-production verification trials (PPVT's) and for block production under the Cropping Systems Program (CSP) in the Rapti Zone. The conclusions presented herein are based on discussions between the team and Bishnu Raj Kafle, the coordinator for the CSP in the PCO office in Tulsipur.

1. PPVT's

a. **Land Types.**--Mr. Kafle proposed that the PPVT data for the 27 panchayats be summarized for 10 land types, which he believed to reflect variations in the natural productivity of land in the region. These landtypes should be related to the land use classification of the Canadian Land Use maps. Use of standard classifications will enhance communicability of results and permit extrapolation of the CSP data to the entire zone.

b. **Summary for each Land Type.**--For each land type, and for each crop (paddy, wheat, maize), the team recommends that the following averages be calculated for each year: average yield under farmer's practices, average yield under recommended practices, and the average yield gain in percent. The average yield gain in percent should be calculated as the average of the yield gains in percent for each PPVT plot.

c. **Summary for the Zone.**--For the entire zone, for each year, the team recommends that the weighted average yield gains for the 10 land types be summarized in two ways, for each of the three crops. The two ways reflect two different sets of weights.

First, a project average for each crop can quickly be calculated by using as weights the number of PPVT plots in each land class.

Second, a zonal average for each crop can be calculated by using as weights the estimated amount of production (in metric tons) that takes place throughout the Rapti Zone on each of the 10 land types. The purpose of such an average would be to develop an estimate of how much zonal yields would increase for each crop if PPVT practices were adopted by every farmer.

The team understands that reliable data on production of each crop by land type are not available. However, for the purpose of taking a weighted average, it is not necessary that reliable data be used as weights. Judgemental, back-of-the-envelope estimates of the amount of production that takes place on each land type are quite sufficient for the purpose, and are much better in any case than a simnple average of the yield gains for the 10 types of land, or for all of the trials. Mr. Kafle felt that it might be possible to come

up with such judgemental estimates, on the basis of official data on production for each district, and his own knowledge of the productivity and distribution of land by land type.

2. **Block Production**

In general, the methodology for classifying land and summarizing the results of crop-cutting date in the Contract Completion Report would be the same for block production as for the PPVT's.

The only difficulty in estimating yield gains for the production blocks in the Rapti Zone is some uncertainty as to the appropriate baseline measure. The problem is that the productivity of agricultural land varies greatly, according to its location and the availability of water. Ideally, one would want to have baseline measures of yields for the identical plots on which block production is being introduced. In practice, two baseline measures are currently available, but each one has certain disadvantages.

a. One measure is the PPVT measure of yields from the same land type in the same panchayat for the same crop under local methods. There are two problems with the PPVT measure. First, the land for which the PPVT measure was calcuated may not be of the same average quality as the land in block production, in terms of availability of water, fertility, and so forth. Second, the PPVT measure may or may not be available for the same year as the block production measure. If it is only available for an earlier year, differences in weather between two years would influence the comparability of the yields.

b. The other measure is the estimate from the Key Informant Survey of average yields for the whole panchayat before the introduction of block production. The measure suffers from three disadvantages: the difficulty of comparing yields from different years, the probability that the land included in block production is, on average, more productive land than the average land in the panchayat, and the unreliability of yield information that is based on the opinion of a few key informants.

The team recommends that alternative estimates of the yield gain based on each of the two baseline measures be developed for each panchayat in the block production program, and be scrutinized for reasonableness. If the data appear suspect for some panchayats, it may be appropriate to exclude them from the average.

In addition, the team recommends that, as the block production program is expanded to additional panchayats, some effort be made to develop more reliable baseline measures of yield for the newly-included panchayats. Two approaches should be considered.

a. The most reliable approach would be to adopt the method used in the PPVT's--namely, doing crop-cuttings on adjacent plots that are being farmed under farmer's traditional methods. If

full-scale application of this method is too expensive, short-cuts may be appropriate. For example, a small, randomly-selected number of such "baseline" crop-cuttings could be made on plots adjacent to block production plots in each panchayat. Furthermore, it may be appropriate to make the baseline crop-cuttings on plots that are smaller than the standard 10 square meters

b. An alternative source for baseline measures of yield is interviews with farmers who join the block production program, at the time they join, and after they have been in the program for a year or two. It remains to be seen whether their answers, based on recollection, and expressed in local units, with no correction for moisture content, could be used for the purpose of measuring the gain in yield as the block production program is implemented on their land.

Annex D: Glossary

AA	Agricultural Assistant
ADB/N	Agricultural Development Bank of Nepal
AIC	Agricultural Inputs Corporation
ADO	Agricultural Development Officer
USAID	United States Agency for International Development
APROSC	Agricultural Projects Services Center, HMG
ARC	Agriculture and Resource Conservation, AID/N
ATU	Appropriate Technology Unit, ADB/N
CCO	Catchment Conservation Officer
CIHE	Cottage Industries and Handicrafts Emporium Ltd.
Chiuri	Bassia Buttrecia, a fruit bearing tree; the kernel contains a saturated oil used in ghee and soap
CSP	Cropping Systems Program
CVIDB	Cottage and Village Industries Development Board
DCVI	Department of Cottage and Village Industries
DLDAH	Department of Livestock Development and Animal Health
DOA	Department of Agriculture
DSCWM	Department of Soil Conservation and Watershed Management
DTO	District Technical Office
ERIM	Environmental Research Institute of Michigan
FAO	Food and Agriculture Organization of the United Nations
GON	Government of Nepal
ha	Hectare = 2.47 acres
HFP	Health and Family Planning, AID/N
HMG	His Majesty's Government of Nepal
HPS	Household Production Systems
IRNR	Institute for Renewable Natural Resources
JT	Junior Technician
JTA	Junior Technical Assistant
kg	Kilogram = 2.21 pounds
km	Kilometer = 0.62 miles
LDO	Local Development Officer
m	Meter = 3.28 feet
MT	Metric Tonne = 0.98 tons
PADCO	Planning and Development Collaborative, Rapti contractor
PCO	Project Coordination Office, Rapti Project
PCRW	Production Credit for Rural Women
PDIS	Project Development and Implementation Support, AID/N
PF	Panchayat Forest
PPF	Panchayat Protected Forest
PMEU	Planning, Monitoring and Evaluation Unit of PCO
PPVT	Pre-Production Verification Trial
PRDP	Panchayat Resource Development Plan
PRM	Program Office, AID/N
RCUP	Resource Conservation and Utilization Project
RD	Rural Development Office, AID/N
Sajha	Cooperative Society
SECID	South-East Consortum for International Development
SFDP	Small Farmer Development Project
WDO	Women Development Officer

Annex E--Checklist of Priority Indicators for the Two Projects

This annex lists high- and medium-priority indicators separately for the two projects. Lower priority indicators are not included here. Although most high-priority indicators already exist or can probably be initiated by the time that the project evaluations take place in September, the team does not propose that all high-pridrity indicators, and no medium-priority ones, be prepared by September. Some of the medium-priority indicators are already available, or can quickly be prepared with available data. One high priority indicator--survival rates for seedlings--probably cannot be prepared by September. The preparation of some high-priority indicators involves spot checks or a small survey, the timing of which must depend on resource availability.

For type of indicator, I is for "impact," M is for "monitoring," and C is for "contextual." For source, "tabs" are tabulations; "data available" means that the raw data are there, but need to be tabulated.

INDICATOR, PRIORITY CLASSIFICATION, PROJECT	TYPE	PAGE	SOURCE
For RCUP			
A. High-priority indicators			
Annual number of seedlings planted & distributed	I	13-15	Tabs available in project office
Survival rates for seedlings	M	19	To be collected
Strategic target for annual seedlings planted	C	15-16	Judgmental, based on discussions with in-country experts
Effectiveness of drinking water & irrigation schemes	M	49	Spot checking
Indicators of progress of construction of physical plant	M	9	Data available in project office
B. Medium-priority indicators			
Forestry			
Seedlings planted by species	M	18-19	Data available in field offices
Number of seedlings planted at remote sites	M	20	Data available in field offices
Quality of management of panchayat-protected forests	M	20	Spot checking
Number of stoves distributed	M	21	Tabs available in project office
Number of stoves used	M	21	Spot checking
Extent of forest cover	C	22	Remote sensing
Agriculture			
Selected CSP measures for Myagdi District	I	23	Data largely available in field offices

INDICATOR, PRIORITY CLASSIFICATION, PROJECT	TYPE	PAGE	SOURCE
Livestock			
A measure of fodder production increases	I	35-36	To be collected
Number of improved animals distributed & offspring	M	36	Data available in field offices
Soil conservation			
Hectares protected by streambank stabilization	I	43	Data probably available in field offices
Gullies controlled	I	44	Available in project office
An inventory of gullies in project areas	C	44-45	To be collected
Percent severely degraded land	C	45-46	Remote sensing
Rural works			
Time saved by rural works	I	47-48	Data available in project office
Indicators of user group effectiveness	M	49	Rapid appraisal
Institutional development & women			
Indicators of progress for staff development	M	8-9	Data available in project office
Indicator of financial flows	M	10	Data available in field offices
Geographic coverage of extension services	M	11-12	Data available in field offices
Beneficiary contribution to costs, in percent	M	12	Data available in project office
Indicators of women's inclusion in the development process	M	41-42	Data available in project office and field offices
Indicators of women's participation	M	42	Rapid appraisal of users' groups
For the Rapti Project			
A. High-priority indicators			
Annual number of seedlings planted & distributed	I	13-15	Tabs available in project office
Survival rates for seedlings	M	19	To be collected
Strategic target for annual seedlings planted	C	15-16	Judgmental, based on discussions with in-country experts
Indicators for the PPVT's	I	25	Data available in project office
Indicators for block production	I	26, 60-61	Most data available in project offices
Aggregate cereal grain production	C	29-30	Tabs available in Kathmandu
Effectiveness of training	I	38	Survey of trainees
Effectiveness of drinking water & irrigation schemes	M	49	Spot checking
Checklist for funds stoppages	M	10	Data available in project office
Indicators of progress of construction of physical plant	M	9	Data available in project office

INDICATOR, PRIORITY CLASSIFICATION, PROJECT	TYPE	PAGE	SOURCE
B. Medium-priority indicators			
Forestry			
Seedlings planted by species	M	18-19	To be collected
Quality of management of panchayat-protected forests	M	20	Spot checking
Extent of forest cover	C	22	Remote sensing
Agriculture			
Indicators of demonstration effects	I	26-27	New survey needed
Fertilizer availability for CSP	M	28-29	Data available in field offices
Potential gains in cereal grain production	C	31-32	Judgmental, based on discussions with in-country experts
Livestock			
A measure of fodder production increases	I	35-36	To be collected
Number of improved animals distributed & offspring	M	36	Data available in field offices
Income & credit			
New business establishments	M	38	Data largely available in project office
Indicators of credit scheme performance	M	38-39	Data available in field offices
Indicators of group performance	M	39	Rapid appraisal
Soil conservation			
Percent severely degraded land	C	45-46	Remote sensing
Rural works			
Time saved by rural works	I	47-48	Data available in project office
Indicators of user group effectiveness	M	49	Rapid appraisal
Institutional development & women			
Indicators of progress for staff development	M	8-9	Data available in project office
Geographic coverage of extension services	M	11-12	Data available in field offices
Beneficiary contribution to costs, in percent	M	12	Data available in project office
Indicators of women's inclusion in the development process	M	41-42	Data available in project office and field offices
Indicators of women's participation	M	42	Rapid appraisal of users' groups