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FROM: Vice President and Secretary

October 17, 1977

BUILT-IN PROJECT MONITORING AND EVALUATION: FIRST REVIEW

Attached is a copy of a memorandum from Mr. Weiner with its accompanying report entitled "Built-in Project Monitoring and Evaluation: First Review" dated October 14, 1977 (Report No. 1758) prepared in the Operations Evaluation Department.

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Office of Director-General
Operations Evaluation

October 14, 1977

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

SUBJECT: Built-In Project Monitoring and Evaluation: First Review

Attached for information is a copy of a report entitled "Built-In Project Monitoring and Evaluation: First Review" prepared by the Operations Evaluation Department.

Attachment

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Report No. 1758

BUILT-IN PROJECT MONITORING AND EVALUATION:

FIRST REVIEW

October 14, 1977

Operations Evaluation Department

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BUILT-IN PROJECT MONITORING AND EVALUATION: FIRST REVIEW

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BUILT-IN PROJECT MONITORING AND EVALUATION:

FIRST REVIEW

Preface

In its Second Annual Review of PPAR Results, OED reported that the performance of several projects had suffered from inadequate attention to project output (as compared with input) by project management, the borrowers and the Bank. This deficiency was felt to be largely the result of inadequate data on output. OED therefore recommended in the report that the Bank pay special attention to "the capacity of the borrowers' information gathering and retrieval systems, particularly on project benefits."

Concurrently, the Bank's contribution to monitoring and evaluation units established in projects it helped finance has grown rapidly.

As a consequence of these developments, and in view of the Bank's evident interest in the availability of data on its projects, the Executive Directors requested that OED evaluate the effectiveness of project monitoring and evaluation units in relation to the purposes they are intended to serve.

This report presents the findings of OED missions in February and March 1977 to six small farmer rural development projects located in Africa, each of which includes a monitoring and evaluation unit. It is the first of a series of reports, each of which will present and analyze the status and performance of built-in monitoring and evaluation systems and activities in Bank projects.

The findings of this study reflect the results of discussions with Bank staff who have been involved in the implementation of the M & E units visited, and of the Bank's Rural Operations Review and Support Unit, which is responsible for guiding the Bank's efforts in M & E systems in agricultural and rural development projects.

The assistance of Government representatives, project staff, and personnel of the monitoring and evaluation units visited is gratefully acknowledged.

BUILT-IN PROJECT MONITORING AND EVALUATION:

FIRST REVIEW

Highlights

This review of built-in project monitoring and evaluation confirms the appropriateness of the Bank's increasing emphasis on this aspect of project work in the last few years. With one exception, all the units visited were felt by the borrowers to have contributed to improving ongoing projects, provoked beneficial adjustments of second-phase projects, or provided valuable information about farmers' constraints to development.

Actual experience with these units has differed from appraisal plans. One of the units no longer exists. The other units, which were originally intended primarily to evaluate project performance and impact, turn out to have given more emphasis to assisting project management through ad hoc studies and preparing follow-on projects than to evaluating project performance and impact.

To the degree that these deviations from plan reflect a correction of what may have originally been an exaggerated emphasis on separating the evaluation function from project management support - only two of the six units reviewed were to be located within the project organization - it illustrates a constructive adaptation to urgent needs. Very useful in-depth surveys were carried out in four units to get a better understanding of the numbers and location, and of the motivations and constraints of intended project beneficiaries and, thereby, establish firmer bases for future efforts to assist them. However, the deviation also reflects significant differences between borrowers and the Bank about the importance of finding out what the actual on-farm impact of these projects has been. At the end of the project periods, production data for evaluating economic impact will be available on a regular basis in only two of the six projects.

Costs remain a major preoccupation of borrowers. These cases suggest that much more attention will have to be directed in the future towards reducing the costs of on-farm yield and production data. These high costs have been a principal cause of the failure of the units to develop acceptable bases for observing whether or not the expected productivity increases are actually being achieved, and what observed deviations from expectations imply for the design and scale of follow-on projects.

In all units but one, data collection exceeds the data processing and evaluation capacity. Largely as a consequence of evaluation staff time having been diverted to project management support, data gathered are in most units not analyzed in a timely fashion. There is also evidence that Bank involvement in monitoring and evaluation has been perhaps unduly directed toward the establishment and operation of new units; it could usefully give more attention in the future to the appropriateness of the amount, type and collection of M & E data and to analyzing the implications of this data once collected.

In sum, while this set of project monitoring and evaluation experiences reveals a number of issues to be borne in mind when building monitoring and evaluation functions in future projects, it also suggests that the objective of establishing these functions remains worthwhile and likely to contribute to project performance and results.

BUILT-IN PROJECT MONITORING AND EVALUATION:

FIRST REVIEW

Summary

i. Bank involvement in project monitoring and evaluation (M & E) has grown rapidly over the last few years. In FY 1976 and FY 1977, about 60% of the agricultural projects had built-in M & E units, costing an average of 2% of total project costs. In FY 1977, the Bank elaborated a series of documents to guide its involvement in monitoring and evaluation.

ii. Six small farmer rural development projects in Africa were selected for this first review of built-in M & E units. One of them did not call for M & E at appraisal but was found to have an active unit in operation.

iii. Appraisal descriptions of goals, contents, costs, staffing and organizational structure of M & E units have become more elaborate over the years. Among the goals, evaluation of project performance to assess its economic impact and measure project management efficiency are given more emphasis than assisting project management. M & E units were to be located within the project organization in only two cases. In two other cases, the units were to be independent from project management; and in the fifth case, M & E activities were to be performed by a consulting firm.

iv. Actual developments have differed from appraisal plans, however, mainly in that most units have given higher priority to assisting project management's needs and preparing follow-on projects, and given lower priority to evaluating actual project performance and impact. In several of the units visited, ad hoc studies on particular issues in response to specific project management needs are given priority over regular surveys aiming at monitoring project performance, particularly those of on-farm production. At the end of the project periods, production data for evaluating economic impact will be available on a regular basis in only two of the six projects. However, very useful in-depth surveys aimed at getting better understanding of the motivations and constraints of the intended project beneficiaries are carried out in four units. Social issues are given special emphasis in those units in which a sociologist works. Secondary activities carried out by the M & E units include preparation of second-phase projects, public relations and liaison between research and extension. These activities are competing with M & E activities for the utilization of the limited staff time available.

v. Costs vary between US$65 and US$300 per family surveyed. Expatriate assistance as an item, and field level measurements of yields and area cultivated as a function, are the most costly components.

vi. Surveying staff is by and large in line with a manager-supervisor-enumerator ratio of 1-4-20, which appears to be satisfactory. However, data processing is a bottleneck in most units because too much data is collected (too large sample size and too great a number of variables surveyed) relative to the data processing capacity. Sometimes data processing systems proved to have been unreliable or not properly tailored to local capabilities. In addition, processing capacity is often reduced by higher level staff being taken up by other than M & E activities (mainly preparation of second-phase projects).

vii. The separation of the unit from the project organization structure has impaired the relationship between some units and project managements and delayed acceptance by the latter of the recommendations based on independent M & E. However, cost considerations and the borrower's expectation that M & E units are to review sectoral issues too, in most cases cause the units to be centralized within the Government apparatus.

viii. Results obtained so far through M & E seem to have largely justified the costs involved. All units but one were felt to have contributed to improving ongoing projects, provoked beneficial adjustments of second-phase projects, or provided valuable information about the farmers' constraints to development.

ix. This favorable conclusion regarding the cost effectiveness of the units needs some qualification, however. First, costs remain a major preoccupation of the borrowers and should be given closer attention. In particular, more effort is needed to adjust sample size to requirements and to avoid accumulation of unused information collected in excess of the unit's limited data processing capacity. For instance, reducing sample sizes should be pursued more intensively both by adjusting precision levels to actual needs and improving sampling methods. For the latter, it is important that the initial survey aim to identify the factors that would permit stratification of the target population into meaningful groups. Second, the objectives and organizational structure of the M & E units will have to meet the particular requirements of project management and the borrowers to ensure their continued support. It should be noted that sometimes the borrower's specific needs may not coincide with those of the project under which the unit is financed. Tailoring the organizational arrangements to the borrower's needs may require some adjustments in Bank expectations. One element, however, on which it may be difficult to compromise is yield data; limited information is now being collected. Since Bank involvement in these projects is based on expected productivity increases, project success cannot be evaluated without such measurements. Efforts to reduce costs of yield and production measurements should therefore be pursued actively.

x. Bank documents generally distinguish between monitoring and evaluation as two separate functions. This study found, however, that the distinction was not perceived in practice and, at least in the six units visited, was considered of limited usefulness.

xi. There is a danger that the Bank is repeating some of the deficiencies observed in the units by not providing adequate capacity to review the findings of the units. Because of the rapid increase in the number of units, Bank supervision has so far been concerned mainly with the implementation of the units, and only in rare cases with drawing lessons from their findings. Bank attention should be focussed on reviewing more systematically the findings of the units; up to now, this seems to depend largely on the individual interest of the staff members. Important exceptions are the appraisals of second-phase projects in two of the countries visited, which used extensively the M & E findings from the first-phase project to improve the design of follow-on operations.

xii. In sum, subject to the qualifications made above, evidence collected for this review suggests that the Bank's involvement in M & E is likely to improve performance of its operations and thus contribute to the development of its member countries. The review also suggests that further efforts should be made to seek ways and means to reduce the costs of M & E which the borrowers consider to be high, to adjust the design of the units to the specific M & E needs as they are perceived by the borrower at national as well as project levels, and to adjust data collection to data analysis and evaluation capacity. The Bank itself should stress in its future M & E technical assistance more focussed (and economical) data collection and give more attention to effective evaluation and synthesis of the information assembled by M & E units. Further, as presently structured, M & E activities compete with other equally important activities, including new project preparation. It may be organizationally more efficient, and in the longer run more profitable, for the country to develop sector planning and project preparation capability separately from the M & E system.

I. Background

Bank Involvement in Monitoring and Evaluation

1. The Bank's involvement in monitoring and evaluation (M & E) of agricultural projects it helps finance has grown rapidly over recent years. Explicit provision for M & E can be found only exceptionally in projects appraised before 1970. In contrast, 60% of the appraisal reports on agricultural projects approved in FY 1976 requested M & E studies, and 20% provided explicitly for those studies in project costs (for a total of US$4.4 million, or 2% of project costs - Annex 1).1/

2. Last year, the Bank organized a workshop in Copenhagen to discuss donor experience with monitoring and evaluation units, and an Operational Memorandum giving the objectives and conditions of the Bank's involvement in M & E was issued in March 1977. The memorandum indicates that by supporting M & E units the Bank expects to (i) improve project management, particularly of the new-style projects, which may require that objectives and components be modified in the course of implementation; (ii) ensure that broad development objectives are achieved; (iii) permit the borrowers and the Bank to draw more systematically on lessons learned from accumulating experience; and (iv) improve the quality and effectiveness of Bank supervision.

Projects Selected

3. Six projects were selected for this review (Annex 2), all of them benefiting small farmers. Four (Malawi, Nigeria, Lesotho, and Mali) are rural development projects. The Upper Volta project, which differs from the above projects only in its lack of social components, did not call for M & E at appraisal but was found by OED to have an active M & E unit in operation. The Senegal project, a first-phase resettlement operation, had M & E for three years, until 1974, when it was disbanded. The Malawi, Lesotho and Senegal projects were selected primarily because their M & E units have been in operation for several years, thus permitting an analysis of lessons learned.

4. Two more preliminary remarks are in order. First, the Malawi and Nigeria projects cover several phases or sub-projects, thus giving the review a somewhat broader base than suggested by the small number of countries visited: about 500,000 families live in the areas covered by the 6 M & E units visited. Second, only a short visit was made to the Malawi project; information on that project presented in this review is drawn largely from the considerable number of documents on the project, including two Project Performance Audit Reports,2/ and this information may be somewhat outdated.

1/ OED's estimate. According to figures provided by the Bank's Rural Operations Review and Support Unit, in 1977, US$24.4 million (or 2.1% of base costs) were allocated to M & E in agriculture, mainly in East and West Africa, and South Asia.

2/ PPA Malawi Lilongwe Land Development Program Phase I (Credit 113), Report No. 751 of May 1975; and Malawi Lilongwe Land Development Program (Credit 244), Report No. 1597 of May 1977.

II. Appraisal Proposals

Appraisal Description of M & E Units

5. The comprehensiveness of appraisal descriptions varies from report to report, but by and large one finds more information in the recent ones. From five lines for the first project in Malawi, appraised in 1967, the description has grown to several pages of terms of reference in the Nigeria and Mali projects, both appraised in 1974.

6. The outstanding features of the appraisal proposals were:

(a) Objectives. Although objectives often overlap, evaluation of project economic impact seems to have been given priority in most appraisal reports. In two cases (Mali and Nigeria), the evaluation of project impact was seen as having a control function over project management performance: i.e., to verify the efficiency of those in charge of project implementation. In all cases, the information collected was expected to help improve follow-on projects. The Lesotho and Senegal units were expected to contribute to the preparation of a second-phase project, and the Malawi operation to the development of future similar activities throughout the country. Monitoring as a tool for guiding project management was explicitly mentioned as an objective of the M & E unit only in the case of Nigeria.

(b) Content. Surveys are mentioned in most reports, but their contents were specified only in the more recent ones, with the emphasis on measuring project-generated output at farm level. In the Senegal project, which aimed at the settlement of a total of 300 families, a minimum sample size (10%) was requested.

(c) Costs. Appraisal cost estimates of M & E varied from less than 0.1% to more than 3% of total project costs, averaging 2.4% for the 6 projects (Annex 2). Of the US$5 million provided in those projects, the 3 Nigeria sub-projects alone accounted for US$3.8 million (76%).

(d) Staffing. In most reports, basic qualifications of the unit managers were specified. An explicit requirement for a statistical analyst appeared in the third-phase Malawi project and in the Nigeria and Mali projects. In the Lesotho and Senegal projects, the participation of a sociologist was recommended.

(e) Organizational Structure. Of the five units proposed at appraisal, two (Malawi and Lesotho) were to be set up within the project organization. In the Nigeria and Mali projects, the appraisal reports stated that the units would be independent from project management because "no organization can satisfactorily evaluate itself." In Senegal, M & E was to be conducted by a consulting firm, but not the one in charge of project implementation, in order to avoid conflict of interests.

III. Actual Developments

Objectives

7. The objectives actually pursued by the M & E units were found to have a different emphasis from those proposed in the appraisal reports and to be more in line with the ones proposed in the Operational Memorandum (para. 2): in most units, assisting project management has been given higher priority than envisaged at appraisal, even though only two units were located within the project organizational structure, while assessing economic impact of the ongoing project has been given lower priority. Considerable time was allocated to ad hoc studies on specific subjects of interest to management in Lesotho, and provision was made for such studies in Nigeria at project management's request. The surveys in the Upper Volta project were designed primarily to provide project management with information necessary to direct the extension effort and locate the rural roads in the areas of greater need. On the other hand, although appraisal proposals for Mali explicitly provided for evaluating project performance, this has been specifically ruled out because the borrower considers that the surveys needed to evaluate project impact would be too expensive.1/

Contents

8. Units visited carried out several types of surveys, and one unit undertook in-depth social behavioral studies. All units were primarily concerned with measuring farm output because the relevant farm inputs, such as infrastructural investments and sales of farm supplies, were expected to be measured by the project itself under standard Bank requirements.

9. All units have carried out at least one broad survey covering 0.8% to 13% of the farming population in the project area. The purpose of these surveys is to obtain statistically representative figures on important variables and base line data in particular. The variables studied are generally: cultivated area, yields, and composition of farm families. In Malawi, Nigeria, Lesotho, and Senegal, the surveys were being repeated annually; and in Upper Volta, two broad surveys are intended. In Mali, however, the surveys are one-time exercises conducted primarily to assess existing conditions in different parts of the project area: in the first of those surveys no data was collected on production. The Malawi, Nigeria and Lesotho projects include explicit provisions for evaluating without-project conditions.

1/ It is noteworthy that in three cases, representatives of the borrower clearly expressed their disinterest in the quantitative criteria used by the Bank to measure performance of rural development projects and their doubts about the cost effectiveness of designing surveys primarily to update appraisal estimates.

10. Three units (Lesotho, Upper Volta, and Mali) have surveyed existing conditions to assess the validity of the farm models presented in the preparation and appraisal reports because the unit managers thought the models were unreliable.1/ These surveys have confirmed doubts about the complete accuracy of the assumptions on which the projects have been based: in Lesotho, 40% more families than assumed at appraisal were found in the area; and in Upper Volta, the cropping patterns of one tribe were found to contain different crops than thought.

11. In the Nigeria, Lesotho, and Mali projects, a separate sample of farm families is being surveyed comprehensively. Data collected under these surveys include farm labor inputs, cultivation dates, cropping patterns, land tenure, livestock ownership and operating methods, spending and savings patterns, and food consumption. The purpose of the surveys is to investigate the motivations and constraints of the intended project beneficiaries and thereby acquire a better understanding of the rural environment which the project is expected to improve. In Lesotho, the main purpose of the surveys was to measure changes in technology and yields and the main factors affecting such changes (including project activities such as improved extension services and farm supplies, and credit). In Mali, where the sample is quite small,2/ this background material is primarily intended to benefit future rural development programs.

12. Social issues, reviewed by all units, were given special attention by the two units in which a sociologist had been explicitly provided for at appraisal (Senegal and Lesotho). In Senegal, the motivations and behavior of potential and actual settlers were thoroughly analyzed on the basis of interviews in the areas both of origin and of settlement.

13. In Nigeria and Lesotho, the M & E units also carry out ad hoc evaluation studies, often at project management's request. The studies cover problems encountered in a particular project component or specific locality of the project area, or proposals for new undertakings about which project management wishes more information and an independent opinion before making its decision. Data used for such studies are drawn from the broad surveys, or collected through separate interviews or small surveys. In the other projects, such studies may be carried out directly by project management, in which case the M & E units are not directly or explicitly involved. An M & E unit is more likely to participate in the ad hoc studies if it is within the project's organizational structure.3/

1/ In one case, the manager himself had been responsible for preparing the models. Only in Lesotho had farmers been surveyed before project initiation, but the head of the M & E unit had no confidence in the findings.

2/ 32 families: 2 families were selected in each of the 4 farm categories of development level and in 4 villages of different size.

3/ In Upper Volta, for instance, the head of the M & E unit is the assistant project manager; he prepares small studies for the project manager and relies, whenever necessary, on the information collected by M & E.

14. Some M & E units are involved in activities that conflict with the M & E exercise. The conflicts arise from two sources: (i) shortage of staff time to carry out the various activities simultaneously; and (ii) incompatibility between those supplementary activities and the need for M & E units to remain objective in their evaluations. Time constraints affect the Evaluation Section in Nigeria; the head of this section is usually required to participate in public relations and procurement activities, which are the responsibility of the Federal agency to which the Evaluation Section belongs.1/ The M & E units' involvement in the preparation of second-phase projects is responsible for the backlog of data and analysis in Lesotho and Mali; in Senegal, the borrower and project management disagreed with the M & E unit when the latter expressed doubts about some of the second-phase project proposals, thus contributing to the premature cancellation of the contract with the consultants in charge of M & E. Conflict of interest affects to some degree the unit in Nigeria because, besides using the unit to check results, the Bank has given the impression that it also wants to use the unit to promote the project concept.

Costs

15. Available cost data are shown in Annex 3. Average costs per family surveyed vary between US$65 and US$300. In terms of specific items, the largest is usually expatriate assistance, accounting for 25% to 40% of these costs. In terms of function, several managers consider the measurement of areas and yields as the most time-consuming part of the surveyors' enquiries; no separate cost data are available, however, to estimate what percentage of these costs it accounts for.

16. In Senegal and Mali, actual recurrent costs for the M & E units are in line with appraisal projections. In Malawi and Lesotho, no quantitative data are available; but actual costs are estimated to exceed appraisal projections, in the latter case because of a clear underestimation at appraisal.

Staffing - Experts

17. Actual staffing of the higher positions is generally along the following pattern: an agricultural economist is in charge of the unit, and he is assited by one or two statisticians and two or three supervisors. Variations revolve around this pattern. In Mali, the statistician works part-time;

1/ The Northern Project Monitoring and Evaluation Unit (NPMEU) under the Federal Department of Rural Development has several functions besides evaluation: communications, public relations, liaison between research and extension, and training.

and in Upper Volta, the Statistics Division of the Ministry of Rural Development assisted the Chief of the Unit, substituting for the statistician.1/ Additional professional staff exist in Nigeria (three economists, one agronomist, and one training expert, all of them in NPMEU) and Lesotho (one economist and one sociologist). In addition to the staff in the central M & E unit in Nigeria (NPMEU), there is a senior evaluation officer in each of the three sub-projects monitored by NPMEU. The staffing pattern is significantly different only in Senegal, where M & E activities were performed by a consulting firm; its team of surveyors was supervised by one part-time sociologist and one part-time geographer. Such staffing patterns seem to have been satisfactory in all of the cases. In Malawi, some of the four professional positions have often been empty; this has been the main problem hampering the unit's work.2/

18. A special word is in order about the use of sociologists. In the Senegal experience, the sociologist succeeded in getting much useful information from limited surveys or interviews. He also seems to have contributed greatly to the thoroughness of the annual M & E report. A similar favorable opinion was expressed on a sociologist's participation in the Lesotho unit but, following a misunderstanding with a co-financer of the unit, the post was eliminated prematurely. Bank staff familiar with these cases have indictated that sociologists should be included in more M & E units. The number of units reviewed in which a sociologist was actually employed was too small for a final conclusion, but the idea clearly warrants closer Bank attention than has been given in the past.

Staffing - Enumerators

19. In all projects, the enumerators have been recruited separately for the M & E unit and are not extension agents temporarily seconded to the unit. However, in three cases extension agents have been directly or indirectly involved in M & E activities. In Mali, they have been successfully used as part-time enumerators. In Senegal, unsuccessful attempts to use extension agents for M & E purposes were made after the consultants' departure. In Upper Volta, the enumerators were selected from among the best extension agents and had six-week training courses in surveying techniques. They will work as enumerators for only two years, after which the data collection load is expected to diminish, and they will then return to extension work part-time. Whether this scheme will prove feasible, however, remains to be seen. Experience shows that the enumerator's task is a specialized one, requiring special training and greater precision than required of extension staff. Furthermore, extension staff are already in short supply, and their diversion to other tasks would be detrimental to project performance.

20. Evidence collected for this study supports the manager-supervisor-enumerator ratio of 1-4-20 proposed at appraisal for the Nigeria unit. In one of the Nigeria sub-projects, the number of staff is being reduced from 74 to 32, partly to improve supervision efficiency. In Mali, the manager

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1/ As mentioned above, no M & E unit was provided for under the project. The M & E system was organized and headed by the assistant project manager. No slot for a statistician existed.

2/ Bank staff in charge of supervising M & E units report that the Malawi case is more representative of the newer projects in this respect: several more recent units are encountering serious difficulties in finding qualified staff to fill top-level positions.

considers his unit's ratio of 1-3-20 slightly inadequate in terms of supervisors.

Staffing - Data Processors

21. Data processing and analysis is weak in three units (Malawi, Lesotho, and Mali) and inadequate in one of the others (Nigeria). The problem has handicapped the Malawi unit from the beginning and, despite the third-phase project's provision for strengthening the unit's data processing capacity, three years of data remained unprocessed in 1976. There was also an accumulation of unused data in Lesotho although the project manager, who was aware of the difficulties in Malawi, was determined to avoid it. In Mali, five months of data on the detailed farm surveys remained unprocessed at the time of OED's visit. In Nigeria, the data backlog seems to be diminishing.

22. The problem was found to affect most units, whether data was processed by computer or by hand. In Lesotho, computerized processing was more accurate and faster than manual, especially for large samples. However, computer services proved unreliable in Malawi, Nigeria and Lesotho - sometimes the available computers broke down, sometimes it took longer than expected to obtain results, and sometimes there were mistakes in the initial results. These were the main reasons for delays in data processing at the beginning of the projects. Thus, data processing arrangements must be tailored not only to the specific requirements of the M & E system, but also to the local availability of computer services - hardware as well as software. The possibilities offered by the use of desk computers, mini-computers and advanced hand calculators must be taken into account too when designing the data processing system. 1/

23. The backlog is not due exclusively to the fact that too much data is being collected relative to the unit's data processing and analyzing capacity. In Lesotho and Mali, it occurred because the preparation of a second-phase project absorbed much of the time of the units' higher level staff.

24. As a result of the data processing difficulties, the Malawi and Lesotho units have reduced the number of families surveyed. In Nigeria, the number of families surveyed has also been cut (by two-thirds), for several reasons including delays in processing data. In Upper Volta, the head of the unit plans to increase the number of farms surveyed from 1% to 5% despite the statistical analyst's recommendations to keep data collection within the limited processing capacity of the unit.

1/ Simple programs for pocket calculators that greatly simplify area measurement, for instance, are in use in three units only and were being introduced in two others. However, none of the units was equipped with the new generation of desk calculators or mini-computers that could greatly reduce time spent on field data collection and processing.

Organizational Structure

25. Relations between the units and project management are excellent in Malawi, Lesotho, and Upper Volta, where the unit is within the project's organizational structure. At the time of OED's visit, relations were poor in Nigeria, partly because of personality conflicts and partly because of complex organizational arrangements which call for a central M & E unit in the Federal Government (NPMEU), and one evaluation officer and supporting staff - who depend administratively on project management but technically on the central unit - in each of the three projects. Thus, the project evaluation officers and the central unit depend on different government authorities. Bank staff report that communication problems between the projects and the central unit are now being sorted out.

26. In Senegal, the contract with the consultant in charge of M & E was cancelled one year ahead of schedule.1/ The background of the cancellation is obscure, involving cost considerations and the appointment of a new project manager. But the consultants' reports on deteriorating project performance and their refusal to fully endorse Government's proposal for the second-phase project,2/ played the greatest role. Since the cancellation, there has been no M & E of the first- or second-phase project, despite assurances by the Government in both cases that there would be.

27. In Mali, the separation was originally envisaged to ensure objective performance evaluation (para. 6e). Subsequently, the separation became more pronounced following a reorganization of the Ministry of Agriculture. The Institute for Rural Economics (IER), the department to which the M & E unit belonged and in which it remained, is in charge of project preparation, and the Mali Government decided that the M & E unit would be more useful if it worked in a broader national perspective rather than specifically for the project. The Government furthermore feared the proliferation of evaluation units in Bank projects and preferred to centralize the effort. Both management of the M & E unit and Government officials believe there is no conflict between using the unit for national purposes and using it to monitor and evaluate performance of ongoing projects. The separation, however, has created delays in transferring information between the unit and project management, although relations are now said to be improving.

1/ All expatriates had left project management posts.

2/ The consultants had prepared a second-phase project for 2,000 families as requested by Government, but they did not support that objective in discussions with the appraisal mission.

Results

28. All of the M & E units have produced very useful information, except that of Malawi which showed yield results that proved difficult to interpret and led to contradictory conclusions.1/ In Nigeria, findings of a survey led to the discovery of financial irregularities in one project agency. Project management in Lesotho felt that the ad hoc studies were crucial to its efficiency, and the survey findings on shifts in cropping pattern or increases of land left under fallow led to beneficial adjustments of the ongoing project and improvements of the design of the second-phase project. In Upper Volta, the head of the unit, who is the assistant project manager, considers that the first survey has given him a better grasp of the tribal differences in the area. (Since in this case the results of the survey have not yet been fully analyzed, it would seem that the process of carrying out surveys itself has proved instructive.) In Senegal, the consultants' findings led to numerous project adjustments: allocation of plots to women, improved arrangements for motivating settler candidates, and several cost reductions in the first- as well as the second-phase projects. Supervision reports were considerably less thorough after the cancellation of the M & E unit. In Mali, after initial resistance from project management, extension services are being intensified in line with the findings of the first M & E survey.

29. Some of the lessons that are being drawn in Mali may benefit future projects in Mali as well as other similar Bank operations elsewhere. It was found, for instance, that in the project area, which is representative of the Sahelian zone, labor constraints can reduce farmers' participation; it was assumed at appraisal that there would be plenty of farm labor available, an assumption often made in small farmers projects. The results of the survey also suggest that the project tended to help primarily the bigger farmers and that it may thereby increase income disparities among the intended beneficiaries. If similar findings are collected by other units, they could be most useful in helping the Bank improve the focus of its rural development projects.

1/ See PPA No. 1597, referred to in footnote to para. 4.

IV. OED Comments

Sample Size

30. How large samples should be to achieve statistically valid results is an important question because it is directly related to the unit's analytical capacity and thus to the cost of its operations.1/ Sample size depends on the type of variables surveyed, the heterogeneity of the population, and the ability to stratify the population into homogeneous groups. It is therefore difficult to give a clear-cut answer. However, it would seem that efforts to reduce sample size could be pursued further than they were in most of the units visited.

31. A Bank report 2/ on the Malawi unit demonstrated that halving the samples would not have reduced the validity of the conclusions. In Upper Volta, the unit's statistical assistant feels that for general evaluation purposes the sample could be kept at 1% or even less. His recommendation is based on a recent survey of national production using several measurements, each taken on 40 farms strategically located throughout the country; the results gave national production estimates of key crops with the unexpectedly small margin of error of ±10%. The head of the Mali unit believes that areas that have not benefited from intensive development programs and are still cultivated traditionally are so homogeneous that their production levels can be properly estimated through surveys with samples varying from 0.25% to 1%, depending on the factors analyzed.

32. The suggestion that samples could be reduced is challenged by many Bank staff members and unit managers, who feel that any reduction in sample size would be detrimental to the credibility of the results. This opinion is based on findings which indeed suggest that the rural environment is relatively heterogeneous - just the opposite of what is claimed by the head of the Mali unit.

33. The controversy is related, first, to accuracy requirements. In Upper Volta, the unit manager proposes to increase samples because he feels that errors should be of less than 5%, in order to allow comparison between the economic returns on alternative road stretches. In Nigeria and Lesotho, however, there was no objection to reducing sample size because the expected increase in margins of error was found to be acceptable in view of the project management requirements. One interviewee did not understand how one

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1/ Another determining factor of costs is the number of variables being surveyed and some feel that instead of reducing the sample size, one should cut the number of variables surveyed. This may be justifiable in some cases, but OED found evidence to support that alternative strategy in only one of the projects reviewed.

2/ Fluctuations of Maize and Groundnut Yields in the Lilongwe Land Development Program, by D. Anderson, June 1975.

could justify expenditures on such broad surveys aimed at reducing uncertainty about production estimates to margins of less than 20% in one limited area of the country, while the total livestock population estimates have margins of over 50%, even though livestock is a key export commodity. It would seem that greater care in establishing margins of error might have resulted in earlier reductions of sample size in four of the six units surveyed. The costs of the units could have been reduced or, alternatively, a greater number of variables could have been surveyed at the same total cost. The appropriate sample size is also related to the stratification of the population. Samples of 40 families in Upper Volta and 32 in Mali are adequate because of an appropriate stratification into homogeneous representative groups of areas or project beneficiaries surveyed. It would be inappropriate to discuss stratification methodologies here, but the findings of this study suggest that (i) greater expertise in statistical analysis to establish proper stratification and sampling methods during the initial years would be justified; and (ii) the need to properly identify the strata, with a view to reducing sample sizes, should be kept in mind when designing the first survey.

Preliminary Surveys

34. Identification of the strata of farmers' groups of greater homogeneity requires a thorough knowledge of the farm population. However, this knowledge is often not readily available to the M & E unit because surveys of the area have rarely been carried out prior to project initiation. Since such information could also improve project design and its justification, it might seem desirable to request that preliminary surveys be part of project preparation and appraisal.1/ M & E findings indeed suggest that some appraisal proposals lacked realism.

35. While early surveys are indeed likely to improve project design, they may not always be of direct use to the M & E unit. Several years may elapse between project appraisal and actual initiation of the M & E unit, and the results of the survey may become outdated. Furthermore, the lack of confidence in project preparation work shown by the heads of several M & E units suggests that they would use data collected in previous investigations only if those investigations were carried out under strict control and with basic documents available for checking - conditions often difficult to fulfill. Furthermore, farm surveys conducted before project initiation may not have covered the information necessary to identify the farmers' groups and would therefore have to be repeated by the M & E unit. There is, therefore, no clear argument for or against requiring preliminary surveys with a view to improving M & E. However, the experience does suggest that in scheduling and costing M & E units in Bank projects, one should allow for a broad initial survey of the area if such a survey has not been carried out during project preparation or appraisal under the conditions mentioned above.

1/ Farm surveys are a standard requirement of project preparation in one division of the Bank.

Complementary Activities

36. A problem brought out by this review is the extensive involvement of several M & E units in activities which may handicap the units' evaluation functions. In particular, preparation of second-phase projects seems to take valuable time away from data analysis. There are evident advantages in requiring staff who are most knowledgeable about the area, i.e. the data analysts of the M & E unit, to prepare future lending programs. This procedure, however, may lead to accumulation of unused data: surveys cannot be stopped during the time staff are diverted to project preparation work if continuous series of data are to be obtained. Thus, the overall efficiency of the units would increase if the task of preparing future projects was administratively separate from evaluation work. However, while such an arrangement would improve the efficiency of the unit, it might not optimize the use of the staff in terms of project management's or the borrower's objectives.

37. The fact that the evaluation units are often charged with preparing follow-on projects calls for two comments. First, it is a measure of the perception of the units as a valuable source of information to improve the design of future projects. Second, the trade-off between M & E activities and project preparation activities calls attention to the staff constraint suffered by many projects as well as the ministries to which M & E units are attached. Since staff qualified to head M & E units or prepare projects are a scarce resource, M & E staff are likely to continue to be involved in other than M & E activities. This constraint should be kept in mind when planning the data collection and evaluation programs of M & E units.

Cost Effectiveness

38. Providing a quantitative estimate of cost effectiveness of the M & E units is not possible, primarily because only in rare cases can a direct relationship be established between the findings of the M & E units and project management decisions. The benefits of M & E units include the assurance they provide for project management, the borrowers, and the Bank's project supervisors, as well as the specific findings resulting from the M & E effort. If cost effectiveness of M & E units cannot be quantified, it can, nevertheless, be appreciated in qualitative terms.

39. From the cost side, most borrowers complained that costs were high. Complaints were strongest in Malawi, Senegal, and Mali. In Malawi, the complaints were properly related to the lack of results of the unit. In Senegal, however, where excessive costs were evoked as a reason for disbanding the unit, it is likely that other factors, including the unit's criticism of project management, played a more determinant role. In Mali, the objection is related to the use of the unit to evaluate project performance and the expectation that the Bank will attempt to increase the number of units. Complaints about excessive costs should therefore be viewed in perspective. This, of course, is not an argument in favor of over-elaborate and costly M & E arrangements; on the contrary, such arrangements should be kept as simple as possible in terms of the objectives they are meant to serve. But it must also be ensured that the required capability is provided to perform all necessary tasks.

40. As illustrated earlier in the report, results of M & E have proved generally satisfactory and helped project management and the borrowers as well as the Bank not only with implementation of ongoing projects, but also with planning and design of follow-on operations. The benefits from these results seem to have justified the costs since project management and the borrower, in all cases visited, planned to pursue the effort. In Senegal, both project management and the borrower expressed interest in resuming an M & E unit in the near future.

41. However, the above favorable assessment of the cost effectiveness of M & E needs to be qualified. First, there is room for considerable improvement in reducing the cost of the information provided, particularly by seeking ways to decrease sample sizes without significantly reducing the value of the results, and by adjusting data collection to the units' processing capacity. The findings of this study also suggest that the assistance of a sociologist - even if only part-time - would enhance cost effectiveness by increasing the scope of the recommendations made on the basis of available data. Second, the borrower's and project management's acceptance of M & E is subject to the units' meeting their specific needs, which primarily involve assistance to project management and preparation of future projects. It appears that units aimed primarily at evaluating project impact would not be viewed with the same interest. The replacement of broad surveys by ad hoc studies in actual practice supports this conclusion. Thus, the favorable impression made so far by the M & E units is not clear-cut, and future attitudes will depend largely on the capability of the units to increase their efficiency and ensure that operations accomplish the various objectives of the sponsors.

Consequences of Differences in Appreciation of Objectives

42. The question is whether the apparent residual interest of borrowers in the evaluation of a project's economic impact will frustrate the Bank's expectation that M & E units would provide the data for such evaluations. Evidence from this review is inconclusive in this regard. Data on yields and area cultivated were collected on a large scale for at least one project year in all units and existing data is so limited that whatever complementary information is provided by the units for the other years, even if it is fragmentary, will help improve the economic evaluation of project performance. However, existing and potential limitations should not be underestimated. Since Mali and Upper Volta have no intention of collecting production data on a regular basis because of the costs involved and Senegal has disbanded its unit, M & E data over all project years will in the end be available in only three units. Furthermore, in one of these cases, data collected so far has proved of little help. Therefore, whether M & E will contribute to measuring project economic impact and simultaneously fulfil project management's needs and those of the borrowers, remains uncertain.

43. The lack of sustained effort by the borrowers to obtain yield data regularly is of concern to OED. Admittedly, collection of such data is costly, has proved of little usefulness in one project and difficult to relate to project performance in two others and, to the extent that data processing capacity is limited, excludes processing information on other

important variables. However, the justification of Bank involvement in all projects visited is based on achieving productivity increases, and it is therefore difficult to see how project performance can be measured without yield data. Since future yield measurements by M & E units will be influenced by the costs of data collection, efforts aimed at reducing sample sizes or measuring production increases indirectly through analysis of other factors 1/ should be pursued actively.

Organizational Arrangements

44. Should the unit be within the project's organizational structure or should it be independent? Evidence suggests that the answer depends largely on the objectives pursued. (a) If the main purpose of the unit is to assist project management, the unit should be within the project structure: it would assure that studies are oriented toward management needs and that the feedback from unit findings is direct. (b) If collection of information for the preparation of future operations is the main goal, the unit is most conveniently located within the Government apparatus where it would have easy communication with planning departments. (c) If the emphasis is on evaluating project management's and the borrower's performance, the unit could be independent from both the executing agency and the Government.

45. Thus, any arrangement entails some sacrifice to one of the goals, as shown by the failure of the independent Senegal unit to influence project management or Government plans for the second-phase project, and by the delays the Mali unit suffered before its findings were accepted by project management. The cancellation of the Senegal unit and the changes in the role of the Mali unit can be explained to a large extent in terms of conflicts between objectives. In Nigeria, a formula was attempted by which M & E activities were set up to serve both the Government and the projects; the experience is not entirely successful, and it is unclear what should be done to strengthen the unit in view of the constraints imposed by the administrative structure of the Federal and State Governments, both of which want to keep control over part of the M & E activities.

46. Cost considerations are also important in determining the organizational structure: economy supports the centralization of the function within the Government structure. Borrowers have expressed concern at the tendency to establish separate units in various projects in one country. There are

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1/ It has been suggested that under certain conditions, project impact can be measured by the increases in farmers' purchases of highly visible goods (tin roofs, bicycles). How such measurements are to be used to detect whether incremental production is the result of an increase in cultivated area or in yields remains unclear, however.

evident advantages to centralizing some of the M & E services.1/ There are also disadvantages of locating the units within the Government, such as: (a) the risk of becoming excessively involved in preparing lending operations rather than in providing assistance to project management; (b) a lack of objectivity in evaluating Government's performance; and (c) delays by project management in accepting the units' findings, particularly if they are critical. With the last point in mind, appraisal reports might appropriately refrain from stressing the independent control function of M & E units.

47. The Bank's internal evaluation procedures are relevant to this discussion. The Bank's experience indeed shows that self-evaluation is necessary to ensure feedback and turn evaluation into a management tool. Therefore, if both objectives of feedback and control are stressed by the borrower, an arrangement could be sought whereby M & E is carried out by a unit within the project structure, and results checked for objectivity by an independent unit.

But this increases cost!

Monitoring vs. Evaluation

48. Bank documents usually establish a clear difference between monitoring and evaluation. Bank staff feel that some of the questions raised in this first review, such as those concerning different appreciations of objectives and alternative organizational structures, can be dealt with more appropriately if a distinction is made between monitoring and evaluation.

49. However, OED experienced difficulties in correlating the definitions of the terms given in Bank papers with M & E activities in the six projects visited. For one thing, Bank reports differ in their definitions of the terms. The distinction between monitoring and evaluation is variously described in terms of input vs. output measurement, regular analysis of key criteria vs. occasional in-depth studies, data collection vs. data analysis, or assisting project management in its day-to-day operations vs. helping Government with improvement of its long-term development programs. None of the M & E units' staff interviewed for this study saw their task as one involving two different types of activities corresponding to any of the above sets of definitions (with the possible exception of data collection vs. data analysis). The two concepts involve closely related functions which did not seem to be readily separable in terms of the activities of the units visited. Perhaps the M & E units set up more recently on the basis of more clearly defined functions will be organized in such a way that the two activities can be separated. This will be pursued in future reviews.

1/ It would seem, for instance, that in Upper Volta, where three units are in operation, it might have been cost effective to involve to a larger degree the Statistical Department of the Ministry of Rural Development, to alleviate the load of statistical analysis in each of the individual projects, in view of the expertise that FAO and UNDP are providing cost-free to that Department.

The Bank's Capacity to Assimilate Findings of the M & E Units

50. The Bank's Rural Operations Review and Support Unit, which has been given responsibility for operational support and guidance for M & E in agriculture and rural development projects, showed, in a 1976 study, that M & E was not regularly mentioned in supervision reports. The unit finds that reference to M & E in supervision reports continues to be sparse and depends primarily on the personal interest of the staff involved. To ensure a more systematic review, the Western Africa Regional Office has appointed a permanent staff member to assist with M & E efforts.

51. Bank supervision of M & E units is so far concerned mainly with progress in implementation of the unit; supervision reports dealing with two of the projects under review and including detailed information on the findings of the units are exceptional. The priority given to implementation aspects over analysis of the findings may be related to the rapid increase in the number of new units. However, there is a danger of the Bank's repeating some of the inefficient practices observed in the M & E units by not providing adequate capacity to review the findings of the units. OED's audits have revealed that regular progress reports on project performance have often been inadequately reviewed. There is, therefore, a real possibility that the Bank will not be able to use M & E information collected under the projects to draw broad lessons for its future operations. OED feels that the Bank is not making enough effort to evaluate and synthesize information, from the M & E units, which OED believes would contribute greatly to the Bank's rural development policy.

52. Such comments are applicable mainly for regular supervision and broad lessons to improve Bank policies. As for appraisal of second-phase projects, the Bank has used M & E findings from first projects to improve follow-on operations in two cases visited: the second-phase Senegal and Lesotho projects, which benefited greatly from the appraisal mission's thorough review of the available M & E reports.

MORE WORK
NEED MONITOR!

V. Conclusions

53. Broad conclusions on design, implementation and performance of M & E units in Bank-financed projects cannot be drawn from a sample covering only six projects, all of them in one continent, nor is it the intention of this review to do so. Nevertheless, some preliminary conclusions would seem to emerge from this first review; they will be further explored in subsequent reviews.

(a) although their perceived cost has been high, the M & E units have produced sufficiently significant results that have contributed to smoother project implementation and better project management, and improved appraisal of follow-on projects;

(b) in spite of this favorable finding, room for considerable improvement - and the will to improve - was found to exist in the countries visited by OED. The countries, for instance, are not yet taking full advantage of all the information being generated by some M & E units for lack of processing facilities. This raises the question of possible over-design, especially in the initial stages of such functions;

(c) the Bank seems to experience similar difficulties in processing and evaluating the information being gathered by M & E units. In its future M & E technical assistance, the Bank should stress more focussed (and economical) data collection, and give more attention to effective analysis and synthesis of information produced by M & E units.

(d) at the time represented in this sample, the Bank approached M & E unit design with excessive emphasis on ongoing and ex-post evaluation of project impact, the crucial role of monitoring as a management tool during project implementation being insufficiently realized. Actual implementation, however, differed from appraisal design in this respect, support to project management being stressed;

(e) at appraisal, greater care should be taken in assessing the specific objectives with regard to M & E units. The Bank design did not adequately recognize "project management" as a function performed at two levels: the project level, concerned with implementing the project itself; and the regional, sectoral or national level, concerned with carrying out a set of projects, including the one the Bank is partly financing. Some of the organizational and functional problems reported here may be traced back to this design flaw. The design of the Nigerian unit is the only one reflecting this double management function.

(f) the Bank did not - and in the circumstances perhaps could not - foresee the consequences of the participation of the M & E units in the preparation of follow-on projects. The competing demands on scarce staff resources for M & E and preparation activities reflects staffing constraints in the relevant ministries, mainly the lack of staff with thorough knowledge of local conditions and sufficient background to prepare development projects. The Bank would seem to be

faced with two alternatives: (i) strengthen the monitoring and evaluation units to clearly provide the capability for new project preparation in addition to strict M & E functions, or (ii) provide technical assistance specifically and separately for sector development planning and project preparation. Both alternatives have advantages and disadvantages. The former could end up in a bloated M & E organization, performing a variety of functions inadequately with the further risk of being discredited for its high cost. The latter would break the immediate link between the lessons learned from a project experience and the design of the next. On balance, technical assistance and training to develop sector planning and project preparation capabilities would appear a better alternative for the country, even if some other institutional link has to be forged to see that lessons of experience are reflected in the design of new projects.

ANNEX 1
Table 1

Appraisal Proposals

Agriculture and Rural Development Projects Approved in FY 1976 With Built-in Evaluation Systems

PROJECT	LOAN/CREDIT	($000) COST OF EVALUATION	% OF PROJECT COSTS 1/
Burundi Fisheries	Cr 626	Not given in Tables	--
Ethiopia Rangelands	Cr 603	" "	--
Malawi Karonga Rural Dev II	Loan 1286	201	2.2
Somalia NW Agriculture	Cr	Not given in Tables	--
Somalia Drought Rehab.	Cr.	" "	--
Tanzania Dairy	Cr 580	" "	--
Tanzania Maize	Cr 606	" "	--
Ghana Upper Region Ag Dev	Loan 1291	" "	--
Ghana Ashanti Region Cocoa	Loan 1181	299	1.9
Niger Maradi Rural Dev	Cr 608	250	2.3
Senegal Livestock	Cr 633	50	.4
Senegal II Sedhiou Ag	Cr 647	407	4.7
Togo Rural Dev.	Cr 638	420	3.6
Upper Volta Rural Dev II	Cr 640	64	.5
Indonesia Foods & Crops Ext.	Loan 1267	Not given in Tables *	--
Indonesia Irrigation VII	Loan 1268	" "	--
Korea Rural Infrastructure	Loan 1216,1218	" "	--
Philippines Magat River	Loan 1154	" "	--
Philippines Livestock II	Loan 1225	" "	--
Philippines Chico Irrigat.	Loan 1227	1000**	1.9
Thailand Phitsanulok Irri.IV	Loan 1149	225	.2
Thailand Rubber Replanting	Loan	Not given in Tables	--
Bangladesh Karnafuli Irri.	Credit 605	" "	--
Bangladesh Rural Dev.	Cr. 631	200	2
Burma Livestock	Cr. 597	Not given in Tables	--
India Cotton Dev.	Cr. 610	" "	--
India A.P. Irri.&Dev	Loan 1251	850	.4
Nepal Rural Dev	Cr 617	77	.8
Sri Lanka Ag Dev	Cr 595	Not given in Tables	--
Afghanistan Livetock II	Cr 649	" "	--
Egypt Fruit&Veg. Dev	Loan 1276	" "	--
Egypt Upper Egypt Drain.II	Cr 637;Loan 1285	" "	--
Morocco Doukkala Irri.	Loan 1201	" "	--
Romania Rasoua Irri.	Loan 1247	" "	--
Turkey Ag Credit(TCZB)	Loan 1248	" "	--
Yemen A.R..Grain Storage	Cr 636	" "	--
Yemen,PDR,Wadi Hadramaut	Cr 615	" "	--
Bolivia Ingavi Rural Dev	Loan 1211	" "	--
Brazil Rio Grande Norte I	Loan 1195	400	1.9
Ecuador Seed Production	Loan 1229	Not given in Tables	--
Mexico Ag & Livestock V	Loan 1217	" "	--

1/ Cost of evaluation exclusive of contingencies, as a percentage of total project costs inclusive of contingencies. This procedure underestimates the actual allocation of funds to M & E.

*Evaluation unit initiated in earlier project.
** Amount includes other projects.

Appraisal Proposals

Agriculture and Rural Development Projects Approved in FY 1976 With Built-in Evaluation System

REGION	SECTOR	PROJECTS DESCRIBED WITH MONITORING AND EVALUATION	PROJECTS WITH EVALUATION UNIT COSTED	COST OF M&E ($000)	AS % OF PROJECT COSTS 1/
Eastern Africa	Rural Dev.	6	1	201	2.2
	Agriculture	1	0	--	--
Western Africa	Rural Dev.	6	5	1191	2.1
	Agriculture	1	1	299	1.9
E.Asia&Pacific	Rural Dev.	4	1	1000	1.9
	Agriculture	4	1	225	.2
South Asia	Rural Dev.	6	3	1127	.5
	Agriculture	1	0	--	--
EMENA	Rural Dev.	4	0	--	--
	Agriculture	4	0	--	--
L.A.&Caribbean	Rural Dev.	2	1	400	1.9
	Agriculture	2	0	--	--
TOTAL	Rural Dev.	28	11	3919	~2
	Agriculture	13	2	524	

1/ See footnote 1/, Table 1.

Appraisal Proposals

Country	Name of Project	Credit or Loan Number	Date of Approval	Total Project Costs (US$ mln)	Costs Allocated to Monitoring and Evaluation (US$)	% of Total Costs 1/	Organizational Set-up: Unit Within Project Organization	Organizational Set-up: Provision for a Sociologist	Organizational Set-up: Arrangements for Data Processing	Objectives (relative importance measured from 1 to 3): Improve Project Management	Objectives (relative importance measured from 1 to 3): Measure Project Impact/Control	Objectives (relative importance measured from 1 to 3): Draw Lessons for Follow-up Projects
Malawi	Lilongwe I	Cr. 113-MAI	FEB 68	7.0	129,600	1.8						
Malawi	Lilongwe II	Cr. 244-MAI	MAY 71	8.59	188,787	2.1						
Malawi	Lilongwe III	Cr. 550-MAI	MAR 75	12.0	409,000	3.4			X			
SUBTOTAL				27.59	727,387	2.6	X				1	2
Nigeria	Funtua	Loan 1099-NIG	DEC 74	57.6	2,280,000	3.9						
Nigeria	Gusau	Loan 1092-NIG	DEC 74	37.4	751,000	2.0						
Nigeria	Gombe	Loan 1164-NIG	DEC 74	42.1	751,000	1.7						
SUBTOTAL				137.1	3,780,000	2.8			X	1	2	3
Lesotho	Thaba Bosiu	Cr. 361-LSO	FEB 73	9.77	39,000 2/	0	X	X			1	2
Upper Volta	Bougouriba	Cr. 496-UV	MAY 74	10.2	-	0	X					
Senegal	Terres Neuves	Cr. 254-SE	MAY 71	1.77	139,700	0.08		X			2	1
Mali	OACU	Cr. 491-MA	JUN 74	18.9	313,000	0.2	X				1	2
TOTAL				205.33	4,998,000	2.4						

1/ The percentage is that of costs specifically allocated to M & E (exclusive of contingencies), as compared with total project costs (inclusive of contingencies). This procedure underestimates the allocation to M & E.

2/ Includes only the cost of the sociologist, not that of the Chief Evaluation Officer included in the project description at negotiation.

ANNEX 2

COSTS OF A FEW ONGOING UNITS

NIGERIA: No actual data is available so far, but a real effort is being made to obtain it. The cost per family in an earlier survey fell between US$290 including and US$130 excluding the cost of the research organizer. These costs do not cover data analysis and preparation of reports, which are estimated at about US$400 per family.

UPPER VOLTA: Total expenditures for surveying equipment: US$4,000.
Annual current expenditures:

- Data collection (enumerator: US$85/month)	US$15,000
- Data processing	US$ 5,000
- Part-time expatriate supervision	US$ 4,000
SUBTOTAL	US$25,000

These costs do not include the training of the enumerator (six weeks) and the expatriate assistants provided by the Statistical Department of the Ministry of Rural Development in preparing the survey.

Total number of families surveyed: 402
Costs per family: US$65 (depreciating equipment over four years, and exclusive of preparation of reports.

SENEGAL: The total costs of M & E were US$133,350, for three years of surveys by consultants on the basis of a 1972 contract allowing for 10% overhead charges. Expatriate assistants, including a sociologist and a geographer, and a team of five surveyors were employed for four months per year.

Total number of families surveyed: 491
Cost per family: US$275

MALI:

Local annual operating costs:	US$61,000
Expatriate manager:	US$40,000
TOTAL	US$100,000

The part-time statistical analyst provided by the Institut d'Economie Rurale is not included. For this amount, the unit (comprising 21 enumerators) completed data collection on 1,000 families (exclusive of area and yield data) and completed one-half year of bi-weekly surveying of 32 families. There is, however, a serious backlog in data processing and analysis.

List of Surveys

Malawi

Primarily farm management surveys on about 1,000 farms. Surveys centered on yield data.

Nigeria

One broad survey of 850 families. Many factors, including yield and area cultivated. Next survey, number of families to be cut to 250.
In future, ad hoc studies to be included in program.

Lesotho

1) Complete list of existing farms in area (17,000 found instead of 12,000 assumed at appraisal).

2) General Evaluation Survey: 343 households surveyed twice a year. Measures include yield & area cultivated, production costs, socio-economic background and attitude.

3) Ad hoc studies on specified subjects.

Upper Volta

One survey of 420 families (1.3% of estimated total). Still incomplete because of delays in measuring yields and area cropped. Intention is to increase number of families to 1,500 (5%) for a second survey. Surveys are primarily to determine existing conditions.

Senegal

1) Annual surveys of production, family composition, labor & other inputs.
Samples:

Year	Total No. Families	Sample
72/73	11	41(27%)
73/74	148	37(25%)
74/75	302	38(13%)

2) A limited number of interviews by a sociologist of families in the area of departure and settlement.

Mali

1) A survey of 1,066 families (1%) to know existing conditions & determine obstacles to larger adoption of project-supported farm inputs. No measurements of yield & production data.

2) Twice a week measurements on 32 families of labor input, budget spending, & savings, input use, dates of operation and output.

3) A survey of 492 families (1%) in a new area to be included in project. Inputs will be measured on all farms, output on only 1/4 of farms.

DRAFT
HRS:lc
August 3, 1973

Project Monitoring

SEWERAGE MONITORING

Use many of monitoring items shown for water. In some cases change produced to collected or treated.

Sewerage Project Indicators

1. Water sold/sewage produced

   Water sold/sewage treated

2. Sewer connections/water connections

   New sewer connections/year/1,000 population

3. Percentage population served by direct sewer connections to public system

4. $\frac{\text{BOD Effluent}}{\text{BOD Influent}} \times 100$ = percentage removed by treatment

   $\frac{\text{SS Effluent}}{\text{SS Influent}} \times 100$ = percentage removed by treatment

5. Cost/kilo (or other unit) of BOD removed

   Cost/kilo (or other unit) of SS removed

6. Sewer investment/1,000 population

7. Actual/potential house connections

8. Total annual cost/capita for sewage collection and treatment

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HRS:lc
August 3, 1973

WATER MONITORS

Staffing

1. Number of permanent employees against targets such as total, can be broken down by category such as:
production/treatment, meter reading, billing and collecting,

etc.

1.1 Number of specialized personnel such as engineers,

accountants, etc., against targets.

2. Employees per 1,000 connections (excluding construction labor).

3. Employees per mgd produced, or sold or other parameters.

4. Number of customer complaints

5. Number of people trained per year in agreed program (actual

vs. agreed or other measure).

System Operations

7. M^3 of water produced

M^3 of water sold

$$\frac{\text{Water Produced - Water Billed}}{\text{Water Produced}} \times 100 = \%$$

8. Total Number of Connections

Number of metered connections

Number of connections by category and % metered

i.e., residential, industrial, etc.

Number of public hydrants, Number of hydrants metered

Number of new connections (total or by category)

Number of new street hydrants

Number of people directly benefitted

9. Connections per 100 population in area.

10. Water billed/capita in area.

11. Water billed/connections (and/or by type of connection).

12. Peak day production

13. Number and length of periods of no pressure or reduced pressure (separate for system as a whole, and specific parts)

    13.1 Average daily hours of service, if intermittent

    13.2 Pressure range on system

    13.3 Number of system leaks repaired

    13.4 Number of meters repaired

    Number of meters repaired/man day

    Number of meters replaced

    Number of meters installed (on new or on unmetered services)

14. Water source data

    14.1 Percentage of sources metered

    14.2 Data routinely collected, stored and usable, on

    river flows

    lakes and impoundments

    groundwater (drawdown, salinity)

15. Laboratory data produced and used

For National or State Programs

1. Percentage or number of cities with public water service

2. Percentage of people in urban population served by water from public system (house connections or house and hydrants)

3. Percentage or number of villages without access to safe water

4. Percentage of village populations having reasonable access to safe water (specify distance to define reasonable)

5. (a) Number of systems completed during period (urban or rural)
   (b) Number of people benefitted.

DRAFT:EFriedmann:jr
August 2, 1973

Central Projects Memorandum No. ....

Project Monitoring Indicators
Public Utilities

1. This memorandum attempts to set up the beginning of a flexible P.U. Project Monitoring System which is expected to develop and improve with experience. The basic elements of the proposed system as described below are a natural development of past Bank experience on appraisal, supervision and more recently operations evaluation work.

2. Appraisal reports usually contain i) a number of key assumptions, or forecasts, regarding future developments (demand growth, revenues, rates of return, disbursements, costs, etc.), and ii) a number of goals, or targets, to be achieved (labor productivity increases, connections, reduction of losses and outstanding bills, etc.). In order to follow-up in a more efficient manner both the accuracy of forecasting and the progress towards achievement of specified targets it has generally been agreed in the Bank that a Project Monitoring System should be developed in all sectors. The proposal is to select a few key indicators of performance in the course of the appraisal, identify them in the appraisal report, discuss them with the Borrowers during appraisal and loan negotiations, and follow up and report regularly on performance. This Central Projects Memorandum (CPM) deals with such a system as it should begin to be applied in Public Utilities projects.

Monitoring System

3. Eight or ten key indicators will be specially selected in the course of appraisal to represent some crucial features of the project including its construction, operation, management, organization,

training and other areas. Some will be used to measure the achievement of agreed performance targets, others to check the development of significant forecasts. Both types should generally be present in every project. The indicators will be listed and clearly defined in a separate Annex of the appraisal report entitled "Monitoring Indicators" which should also indicate if these are to be measured quarterly, half-yearly, or annually. The selected indicators will be discussed during appraisal and negotiations. The borrower will agree to report periodically on these as a part or in addition to its regular progress reports. At the appropriate time intervals the Regional staff in charge of Project Supervision should report and comment specifically on the evolution of the indicators. It is expected this information would become part of the Supervision Summary reporting system applying to all projects in all sectors.

Indicators

4. In order to facilitate the appraisal teams' work we are attaching two Annexes containing some examples of indicators which might be appropriate in Power and Water/Sewerage projects. The list is only indicative and does not attempt to be complete. The staff concerned are expected to use their best judgment to modify the suggested indicators or include new ones which would apply better to the specific projects.

5. As experience in the application of the Monitoring System grows, this memo and its attachments will be updated. In particular, after about a year of application we expect to produce a list of Project Indicators which have been actually selected by the staff.

6. As a final point, it should be emphasized again that this system is only intended to highlight key elements already being considered in the appraisal and supervision process, thus i) it should not entail significant extra work, ii) it complements, improves but does not substitute for the particular covenants on rates, debt limitations, etc. already provided for.

Attachments (2 Annexes)

EFriedmann:jr
August 2, 1973

EXAMPLES OF POSSIBLE POWER SECTOR INDICATORS

Staffing

1. Number of employees as related to specific targets (total or special categories such as technical, administrative, etc.).
2. Number of employee per 1,000 connections.
3. Number of employees per MW installed in:
   - 3.1 Hydro generating plants
   - 3.2 Thermal generating plants.
4. Number of employees in transmission per Km of line.
5. Number of employees in distribution per GWh sold at distribution level.
6. Training indicators as referred to specific targets (participants, successful, kept in company, etc.).

System Operating Characteristics

7. kWh sales (by category).
8. Number of connections (by category).
9. Connections per 100 population in service area (urban/rural)
   - 9.1 kWh sold per connection (urban/rural).
10. MWA of distribution transformer capacity ÷ total generating installed capacity.
11. Generating plants availability by plant (hours or % per year - separate planned and accidental outages).
12. Generation, transmission, and distribution losses.
13. Peak demand (usually 30 minutes).
14. Load factor.

15. Thermal plant utilization by plant (energy generated ÷ total energy capcity minus planned outages).

16. System reserve margin (define as adequate to the characteristics of particular system).

17. Transmission line faults in number per year per 100 Km at different voltage levels or transmission line outage time in circuit Kms (per voltage) per year.

18. Distribution faults per year and per 100 Km of distribution line.

19. Average BTU's per kWh generated.

INTERNATIONAL DEVELOPMENT ASSOCIATION | INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT | INTERNATIONAL FINANCE CORPORATION

Please Pass fast: (1) [illegible] (2) ~~H. Shifman~~ (3) Frieden

OFFICE MEMORANDUM

TO: Mr. E. Friedmann

DATE: July 26, 1973

FROM: James J Fish JJF

SUBJECT: Project Monitoring System
Mr. Rovani's memo of June 13, 1973

1. Mr. Thys has commented separately on the specific indicators proposed for water supply. Similar comments can be made for the power indicators, but for the time being I would prefer to address myself to the specific proposal and objective; the choice of indicators and their definition can follow.

2. I agree that we should, undoubtedly, concern ourselves with the technical and managerial efficiency of our borrowers in addition to the measures of financial performance already monitored. The problem is, how? I believe we all recognize that there are inconsistencies from borrower-to-borrower (and region to region?) in our treatment of, and involvement in, these matters of management and efficiency that are largely the result of daily operating decisions. I still have enough faith in our system to believe that we do identify, in the course of appraisal, operational/managerial areas that are leading to gross inefficiencies, and treat them appropriately in the loan documents. My difficulty with the proposed procedure is that it would formularize this process, but at what cost in staff time and for what gain in total performance? The temptation to "run" our borrowers' operations is already quite strong. Maybe we could do a better job in many cases, but we must accept our limitations. A checklist would be fine and I believe we should accumulate data on a few (very few) specific indicators of relative performance to use as guidelines, but if we adopt the mandatory procedure inevitably we will find ourselves spending time explaining why the indicators for Pakistan, say, are not the same as those for India, when the whole question is probably irrelevant in the first place. In short, I believe we should continue to resist procedures which unnecessarily substitute for the judgement of the staff member, and therefore I object to the mandatory nature of the proposed annex and loan conditions.

[margin note: getting at "efficiency" is not the only reason for the indicators]

3. (I also note that there is some ambiguity between the draft CPM and the attachments regarding the use of the indicator "data bank" -- the draft CPM says the key indicators are not meant for comparison between countries, presumably recognizing the irrelevance issue, whereas the draft Annex 1 says "they can be used to compare with ... other enterprises".)

4. With regard to the specific indicators, it seems the addition of something on inventory turnover and stores control -- often an area where efficiency can be improved -- would be useful in the checklist.

cc: Messrs. Thys, Finzi, Wyatt
EMENA Files, Div. Files, Chron. File

JJFish:pww
IBRD

INTERNATIONAL DEVELOPMENT ASSOCIATION | INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT | INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Public Utilities Division Chiefs DATE: June 13, 1973

FROM: Y. Rovani

SUBJECT: Project Monitoring System

1. Please find attached a self-explanatory draft Central Projects Memorandum (CPM) on the above subject. Before issuing it in its final format I would appreciate receiving your comments both on the proposed text of the memorandum as well as on the Indicators suggested in its 2 Annexes. With regard to the latter I am fully aware that they may be improved substantially after their review by selected members of your staff (to facilitate this I am including 5 copies of the draft CPM). As background information on this subject I would like to draw your attention to the attached memo of January 19, 1973 of Mr. Urquhart and to Mr. Willoughby's paper on Project Monitoring dated January 17, 1973.

2. In addition to this draft CPM we intend to prepare others dealing with Internal Economic Return; Checklist for Telecoms. Procurement; Checklist for Power Procurement; Checklist for P.U. Project Appraisal and Outline for Appraisal Reports. These will also be sent to you in draft form for comment.

3. With regard to the attached CPM on Project Monitoring I would appreciate if you could send all your staff comments and suggestions as soon as possible. If, in addition, you would like to hold a special meeting of P.U. Division Chiefs to discuss the subject, please let me know and I will be glad to make the necessary arrangements.

Attachments

cc (with draft CPM only) to: Messrs: van der Tak, J.A. King, Armstrong
cc " " " to: P.U. Advisory Staff
Files

EFriedmann:jr
IBRD

DRAFT

Central Projects Memorandum No. ...

Project Monitoring Indicators
Public Utilities

1. This memorandum attempts to set up in a flexible manner the beginning of a P.U. Project Monitoring System which is expected to develop and improve with experience. The basic elements of the proposed system as described below are a natural development of past Bank experience on appraisal, supervision and more recently operations evaluation work.

2. Appraisal reports usually contain i) a number of key assumptions, or forecasts, regarding future developments (demand growth, revenues, rates of return, disbursements, costs, etc.), and ii) a number of goals, or targets, to be achieved (labor productivity increases, connections, reduction of losses and outstanding bills, etc.). In order to follow-up in a more efficient manner both the accuracy of forecasting and the progress towards achievement of specified targets it has generally been agreed in the Bank that a Project Monitoring system should be developed in all sectors. The proposal is to select a few key indicators of performance in the course of the appraisal, identify them in the appraisal report, discuss them in loan negotiations, and follow up and report regularly on performance. This CPM deals with such a system as it should begin to be applied in Public Utilities projects.

Monitoring System

3. Eight or ten key indicators will be selected in the course of appraisal to represent important or critical features of the sector/project development including construction, operation, management, organization, training and other areas. Some will be used to measure the achievement of

agreed performance targets, others to check the development of significant forecasts. Both types should be present in every project. The indicators will be listed and clearly defined in a separate Annex of the appraisal report entitled "Monitoring Indicators" which should also indicate if these are to be measured quarterly, half-yearly, or annually. The selected indicators will be discussed during appraisal and negotiations and incorporated in the loan documents. The borrower will agree to report periodically on these in addition to regular progress reports. The manner of recording these agreements might vary depending on the characteristics of the selected indicators. They might be a part of the Loan Documents, a Side Letter or other suitable legal document. At the appropriate time intervals the Regional staff in charge of Project Supervision should report and comment specifically on the evolution of the indicators. It is expected that eventually this would become part of the Supervision Summary reporting system applying to all projects in all sectors.

Indicators

4. In order to facilitate the appraisal teams' work we are attaching three Annexes containing indicators which might be chosen in Power, Water and Telecoms. projects. The list does not attempt to be complete and is only indicative. The staff concerned may easily modify the suggested indicators or include new ones which would apply more readily to their specific needs.

5. As experience in the application of the Monitoring System grows, this memo and its attachments will be updated.

6. As a final point, it should be emphasized again that this system is only intended to highlight key elements already being considered in the

appraisal and supervision process, thus i) it does not entail significant extra work, ii) it is additional to and does not replace regular reporting on the projects under supervision; and iii) it does not substitute for the particular covenants on rates, debt limitations, etc. already provided for. Also the key indicators are not meant to be used for comparisons between utilities.

Attachments (2 Annexes)

EFriedmann
June 13, 1973

D R A F T
1/17/73
CWilloughby

PROJECT MONITORING

One of the most significant recommendations emerging in the Colombia Evaluation Report related to Project Monitoring. From experience of the 35 projects reviewed it was suggested that "Project supervision in most fields needs strengthening by fuller information flows on project performance and more analysis of this information." The recommendation was intended to refer to projects in all sectors financed by the Bank and is hence particularly relevant to the Central Projects Staff generally. I believe this recommendation -- which incidentally seems to have been confirmed by our most recent studies -- was in line with wide-spread thinking in the Bank, as well as with efforts that were already underway in some of the then Projects Departments. I am aware of several important steps that have since been made -- for instance in connection with a number of railway projects (particularly Bolivia and Colombia) and in the form of the work Prof. John Schmidt is beginning for the Mexican agricultural credit projects. Nevertheless there still seems to be considerable disagreement about what Project Monitoring means, and it may be useful to clarify and develop at least what we meant by the reference.

For us Project Monitoring means a system of regular reporting of summary indicators about the progress of a project, generally including comparison with earlier targets or forecasts. It is neither more nor less than an information system, designed principally to meet the needs of the Bank but also of considerable use to others. I think there are five

key features to the system we have in mind. First, the indicators would be non-standardized; they would be selected to capture performance on key elements in the economic success of the particular project or in the resolution of problems identified at the time of appraisal. Second, the indicators used would be limited to 8 or 10 per project, in order to focus attention on the most important issues. Third, target levels of the indicators for, say, six-monthly periods in the future would normally be discussed and agreed at the time of appraisal and negotiations, although the system would also sometimes be used to generate information for comparison with forecasts (for example, of traffic in transport projects) or even simply to indicate trends not forecasted (for example, for sub-projects of DFCs loans). Fourth, the system for generating, assembling and summarizing the information would be agreed at the time of appraisal -- and its establishment would be integrated with any management assistance provided. Fifth, as the project unfolds, the actual values of the indicators would be reported in readily understandable form, with target or forecast values for comparison wherever appropriate, in project progress reports. Within the Bank they would be regularly given in supervision reports and probably, eventually, on the new proposed reporting form for project supervision work.

The general purpose of such a system would be more effective and cheaper project control, and improved allocation of supervision and technical assistance effort. Other specific advantages would be:

(a) to provide more objective and continuous summaries of project performance than is generally possible at present;

(b) to assist and stimulate the development and use of management information systems by borrowers;

(c) to help meet the frequently cited need of country planning authorities for information on actual performance of on-going projects.

The costs to the Bank of such a system would, I think, be relatively small. Selection of appropriate indicators and agreement on means of generating the required information should add little to the load of a modern appraisal mission. Normally these indicators would be nothing more than the pinnacle of the borrower's existing management information system. An exception might be agricultural credit projects, which raise survey, sampling and control group problems; but accumulating experience on these aspects -- for instance in the Mexican project -- should make appropiate systems easier to establish in other countries. On several of the few agricultural projects we have been concerned with we have also been surprised by the large amounts of data already collected on participating farms, and even computerized, but not always used to produce effective management reports. The point at which some additional staff-time might be required for projects in most sectors would be loan negotiations, when agreement would be sought on specific target values for at least some of the indicators. Reception and presentation of the data in the Bank could be largely handled by research assistants and should in fact reduce the supervision load on professional staff.

To clarify further what I have in mind and to indicate the relevance of such system to projects of all types, I have prepared illustrative

lists of likely indicators for several types of project -- power, highways, agricultural credit and DFCs sub-projects (Attachment II). On these lists I have omitted summary physical indicators on construction progress since these are generally already quite readily available, if not presented in quite the way I am suggesting. The indicators are generally rather composite ones, intended to reflect as much as possible outputs rather than inputs, and trends that should result from improvement programs rather than progress in implementation of such programs.

I want briefly to take a hypothetical port project to illustrate the way in which I would see the system being applied. The project covers mainly the provision of modern equipment for improved operation of the port's existing facilities. Principal items covered by the loan, made in 1973, are four dredgers, some river training works at the port access, and cranes and mechanical handling equipment at the docks themselves. The main problems identified at the time of appraisal, and which the project is intended to help solve, are: (a) bad financial situation due to tariffs being too low to cover the port's high costs, and in part also to delays in payment for port services and inadequate rentals for land and warehouses rented out to merchants and industrialists; (b) shortage of modern cargo handling equipment delaying ship turnaround time which had resulted in the imposition of a surcharge by the conference lines; (c) high proportion of time out of commission for existing dredging equipment due to inadequate preventive maintenance, workshops overstaffing and delays in supplies of spare parts from stores. The complete set of indicators selected at the time of appraisal is shown on Attachment I,

together with target values agreed at the time of loan negotiations; assuming that we are now in 1976, actual values of the indicators for the first 3 years of the project's life are also shown. It will be seen that the indicators correspond directly to key elements in the project's economic viability, to the specific problems just mentioned, and to the equipment provided. At the end of the first 3 years of the project's life traffic is somewhat ahead of forecasts, but overall financial performance, although improved, is not up to target levels. Improvement in collections and in property earnings has been significantly better than forecast. But operating performance on the port side has been disappointing and productivity has improved less than expected. The major problem responsible for this, on which it has been possible to make little progress as the indicators show, is the frequent delays that occur in provision of stores for maintenace and repair of port operating equipment and port vessels.

Many projects will of course be expected to have somewhat more delayed effects than in the case of the essentially equipment loan discussed. Many indicators may nevertheless be expected to show improvement during the course of project execution, but the forecasts and targets would clearly need to be extended to cover at least the first year or two of the project's operating life.

It seems to me that the steps that might be taken to expedite introduction of a Project Monitoring system of the kind described might be as follows:

1. Preparation of illustrative lists of typical indicators that might be expected to be useful for projects in each sector. I

should imagine that the Central Projects Staff would be able to accomplish this in a matter of weeks.

2. Insertion of a reference to the suggested system in instructions for project appraisal and supervision.

3. Application of the system to a test case or two in each sector where it has not so far been applied.

4. Review of experience of the system after a few months.

5. Adjustment of appraisal and supervision instructions to give a firmer and fuller reference to the system as modified in the light of earlier experience.

6. Revision of the proposed new reporting form for supervision to permit inclusion of target and actual values of the indicators at least for the current period.

KANADU PORT PROJECT: VALUES OF KEY INDICATORS FOR SIX-MONTH PERIODS ENDING:

ATTACHMENT I

	Unit	Actual 12/31/72	Actual 6/30/73	Forecast 12/31/73	6/30/74	12/31/74	6/30/75	12/31/75	6/30/76	12/31/76	6/30/77	12/31/77	6/30/78	12/31/78
Volume of dry cargo handled														
Forecast	mln.tons			2.9	3.4	3.5	4.0	4.1	4.2	4.3	4.5	4.6	4.8	5.0
Actual	per 6 mos.	2.7	2.5	3.0	3.5	3.0	3.8	4.3	4.7					
Average Rate of Discharge, General Cargo														
Target	Imports: ave. tons			400	460	480	550	570	540	600	610	620	630	650
Actual	per ship per day	360	340	380	440	390	480	520	540					
Dredgers' Availability Factor														
Target	% time out of			65%	70%	80%	82%	84%	84%	84%	84%	84%	84%	84%
Actual	service	76%	59%	55%	60%	83%	82%	75%	73%					
Maintenance Staff														
Target	Ave. no. per $ mln.			8.0	7.6	7.2	6.8	6.3	6.0	6.0	6.0	6.0	6.0	6.0
Actual	of gross assets revalued	8.0	8.4	8.5	8.7	8.4	8.0	7.4	6.8					
Stores Availability														
Target	Ave. no. of weeks			20	15	10	5	4	4	4	4	4	4	4
Actual	since submission of indents outstanding as of:	25	25	21	18	19	20	18	19					
Operating ratio														
Target	Op.costs inc. 5%			106	106	100	95	90	87	84	80	80	80	80
Actual	depreciation as % rev.	124	127	110	110	105	102	105	101					
Earnings from Leaseable Property														
Target	semi-annual			1.3%	3.0%	3.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Actual	net rate of return	1.4%	1.3%	1.4%	3.2%	3.6%	5.5%	6.0%	6.0%					
Collections														
Target	accounts receivable			35%	30%	26%	22%	18%	18%	18%	18%	18%	18%	18%
Actual	as % past 6 months' billings	30%	37%	37%	35%	30%	26%	20%	16%					

(as it appeared in Report '76)

XANADU PORT PROJECT: VALUES OF KEY INDICATORS FOR SIX-MONTH PERIODS ENDING:

ATTACHMENT I

	Unit	Actual		Forecast										
		12/31/72	6/30/73	12/31/73	6/30/74	12/31/74	6/30/75	12/31/75	6/30/76	12/31/76	6/30/77	12/31/77	6/30/78	12/31/78
Volume of dry cargo handled														
Forecast	mln.tons			2.9	3.4	3.5	4.0	4.1	4.2	4.3	4.5	4.6	4.8	5.0
Actual	per 6 mos.	2.7	2.5	3.0	3.5	3.0	3.8	4.3	4.7					
Average Rate of Discharge, General Cargo														
Target	Imports: ave. tons			400	460	480	550	570	540	600	610	620	630	650
Actual	per ship per day	360	340	380	440	390	480	520	540					
Dredgers' Availability Factor														
Target	% time out of			65%	70%	80%	82%	84%	84%	84%	84%	84%	84%	84%
Actual	service	76%	59%	55%	60%	83%	82%	75%	73%					
Maintenance Staff														
Target	Ave. no. per $ mln.			8.0	7.6	7.2	6.8	6.3	6.0	6.0	6.0	6.0	6.0	6.0
Actual	of gross assets revalued	8.0	8.4	8.5	8.7	8.4	8.0	7.4	6.8					
Stores Availability														
Target	Ave. no. of weeks			20	15	10	5	4	4	4	4	4	4	4
Actual	since submission of indents outstanding as of:	25	25	21	18	19	20	18	19					
Operating ratio														
Target	Op.costs inc. 5%			106	106	100	95	90	87	84	80	80	80	
Actual	depreciation as % rev.	124	127	110	110	105	102	105	101					
Earnings from Leaseable Property														
Target	semi-annual			1.3%	3.0%	3.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Actual	net rate of return	1.4%	1.3%	1.4%	3.2%	3.6%	5.5%	6.0%	6.0%					
Collections														
Target	accounts receivable			35%	30%	26%	22%	18%	18%	18%	18%	18%	18%	18%
Actual	as % past 6 months' billings	30%	37%	37%	35%	30%	20%	20%	16%					

ATTACHMENT II

ILLUSTRATIVE LIST OF TYPICAL INDICATORS FOR PROJECTS IN SELECTED SECTORS

Electric Power

Six-monthly rate of return on average net fixed assets (agreed target or minimum)

Training Program: numbers enrolled (agreed target)

numbers successfully completing (agreed target)

Customers per Employee (agreed target)

Aggregate average outage rate on generating plant (agreed target)

Peak loads (forecast)

Industrial (and/or Agricultural) share of energy sales (forecast)

Number of new connections made (agreed target)

Average delay in connecting new customers in areas already served (agreed target)

Inventory levels as per cent of stores used in a six-month period (agreed target)

Highways

Vehicles per day (forecast)

Trucks per day (forecast)

Per cent achievement of agreed new maintenance system (agreed target)

Average maintenance expenditure per mile for paved roads (agreed target)

Average per cent of maintenance equipment out of commission (agreed target)

Number of agricultural extension workers in area traversed (agreed target)

Consumption of fertilizer in area traversed (forecast)

Volume of cotton sold from area traversed (agreed target)

Price of cotton paid to farmer at farm-gate (forecast)

Price of cotton paid to farmer who delivers to market center (forecast)

General trucking rate between points A and B on road (forecast)

Passenger bus fare between points A and B on road (forecast)

Sales tax collections in area traversed (forecast/trend)

Number of current and savings accounts in banks in area traversed (forecast/trend)

Agricultural Credit (Mainly based on Sample Survey)

Number of farms covered (agreed target)

Number of hectares covered (agreed target)

Median size of farm covered

Repayments outstanding three or more months as a proportion of total credit outstanding (agreed target or maximum)

Average net farm income of farmers covered in first year of program (agreed target)

Average net farm income of farmers covered in second year of program (agreed target)

Number of agricultural extension workers working on project (agreed target)

Gross production value of rice in region covered (forecast)

Total cattle herds on participating farms (agreed target)

Average calving rate on livestock herds covered in first year of program (agreed target)

Average calving rate on livestock herds covered in second year of program (agreed target)

Average weight of steers sold in year by farmers covered in first year (forecast)

DFC Industrial Sub-Projects (Trends, or for Comparison with DFC's Appraisal Forecasts)

Rate of Return on gross assets

Capacity utilization rate

Increase in employees

Marginal capital-labor ratio for period

Labor productivity: Gross value added per worker

Average real wages and fringe benefits per worker

Income Distribution: aggregate wages above agreed salary level plus profits as % value added

Average domestic sales price as % of equivalent import

Export share of sales

Net foreign exchange earnings on export sales

Per cent of total non-labor inputs domestic

Per cent of gross investment covered by internal cash generation

Number of shareholders

Average interest rate on debt outstanding

Debt service as per cent of total sales revenue

DRAFT

POWER SECTOR INDICATORS

NOTE: Technical and financial indicators normally shown in appraisal reports are not listed below, but they should be considered when selecting the indicators to be monitored.

Although the main purpose of these indicators is to monitor the performance of a particular enterprise, they can also be used to compare with selected characteristics of other enterprises. This should always be done with caution, but to reduce the possibility of misinterpretations, the definitions provided should be used as far as possible in all cases.

Staffing

1. Number of employees (show separately: total, generation, transmission, distribution, others)
   - 1.1 Number of professional engineers
   - 1.2 Number of qualified accountants
2. Number of employee per 1,000 connections (exclude construction labor)
3. Number of employees (per MW installed) in:
   - 3.1 Hydro generating plants
   - 3.2 Thermal generating plants
4. Number of employees in transmission per Km of line
5. Number of employees in distribution per GWh sold at distribution level

6. Participants in agreed training programs: actual vs. programmed

System Operating Characteristics

7. kWh sales (by category)
8. Number of connections (by category)
9. Connections per 100 population in service area (urban/rural)

   9.1 kWh sold per connection

10. MWA of distribution transformer capacity ÷ total generating installed capacity
11. Generating plants availability by plant (hours or % per year - separate planned and accidential outages)
12. Generation, transmission, and distribution losses
13. Peak demand (usually 30 minute)
14. Load factor
15. Thermal plant utilization by plant (energy generated ÷ total energy capacity minus planned outages)
16. System reserve margin/(installed capacity - peak demand)÷ peak demand/
17. Transmission line faults in number per year per 100 km at different voltage levels or transmission line outage time in circuit kms (per voltage) per year.
18. Distribution faults per year and per 100 km of distribution line
19. Average BTU's per kWh generated

Financial Characteristics

20. Net plant investment - total, generation, transmission, distribution-per MW of generating capacity (plant revalued as necessary, exclude work in progress)

21. Average net plant investment per GWH sold - total, generation, transmission, distribution-per GWH sold
(plant revalued as necessary, exclude work in progress)

22. Average depreciation rate (annual depreciation charge ÷ average gross plant excluding work in progress)

23. Weighted average repayment period of debt outstanding at year end

24. Weighted average interest rate on debt outstanding at year end

25. Operating revenue per unit of value of gross plant (total operating revenue ÷ gross plant excluding work in progress)

26. Operating revenue per connection

27. Average revenue per kWh sold (total and by consumer class)

28. Cash operating expense per unit of value of gross plant (exclude depreciation)

29. Total operating expense per kWh sold

30. Total employment cost per employee (salaries, wages, benefits)

31. Fuel cost per million BTU (US¢ and local currency)

32. Number of average days bills outstanding (bills outstanding x 365 ÷ total billing for year)

33. Revenue effectiveness index

$$\left(\frac{\text{Revenue Collected} \div \text{gross kWh generated}}{\text{Average Revenue Billed per kWh}}\right)$$

34. Internal cash ratio

(net operating income plus depreciation less debt service, less changes in non-cash working capital, less dividends, taxes, etc. ÷ gross plant investment, including work in progress.

JHJennings/EFriedmann:jr
June 14, 1973

WATER SECTOR INDICATORS

NOTE: Technical and financial indicators normally shown in appraisal reports are not listed below, but they should be considered when selecting the indicators to be monitored.

Although the main purpose of these indicators is to monitor the performance of a particular enterprise, they can also be used to compare with selected characteristics of other enterprises. This should always be done with caution, but to reduce the possibility of misinterpretations, the definitions provided should be used as far as possible in all cases.

Staffing

1. Number of employees (~~show separately: total, production/ treatment, transmission/distribution, meter reading/ billing and collecting, others~~) and/or categories against targets such as

   1.1 Number of professional engineers technical

   1.2 Number of qualified accountants

2. Employees per 1,000 connections (excluding construction labor)

3. Number of employees (per average mgd produced) or sold or other

4. Number of vacancies at professional/technical level

5. Number of customer complaints

6. Participants in agreed training programs: actual vs. programmed

7. No. of metres repaired/man day

System Operating Characteristics

7. Mg (or m^3) produced

7.1 Mg (or m^3) consumed/sold

7.2 Unaccounted for water (% of production)
(Differ between water produced and units billed)

8. Number of connections (by category, i.e., by size of connection or by residential, industrial, etc. In either case, show number of public taps.)

8.1 Number of metered connections (by category, i.e., by size of connection or by residential, industrial, etc. In either case, show number metered of public taps.)
No. of ~~% of~~ meter bills based on metered readings

9. Connections per 100 population in service area (urban/rural)

9.1 Consumption per capita in service area

9.2 Consumption per connection
" by type of consumer

10. ~~Total production as a % of supply capacity~~

11. Peak day demand

11.1 ~~Peak day demand as % of production capacity~~

11.2 ~~Storage capacity as % of average daily demand~~

12. Number and length of periods of no pressure or reduced pressure (separate for system as a whole, and specific parts)

12.1 Average daily hours of service, if intermittent

12.2 Pressure range on system

12.3 Number of system leaks repaired

12.4 Number of meters replaced, repaired,

12.5 Number of disconnections for non-payment of bills

13. Water source data

% of sources metered

13.1 Streams - stream gauging data

13.2 Lakes and impoundments - water level, discharge and yield data

13.3 Groundwater - static level and drawdown data

Data Collection & storage

~~14. Laboratory analysis data~~

~~15. Average filter rates~~

Financial Characteristics

16. Net plant investment - total, production/treatment, transmission, distribution per average mgd produced (plant revalued as necessary, exclude work in progress)

17. Average depreciation rate (annual depreciation charge ÷ average gross plant excluding work in progress)

18. Weighted average repayment period of debt outstanding at year end out

19. Weighted average interest rate of debt outstanding at year end out

Debt Service Coverage

20. Operating revenue per unit of value of gross plant (total operating revenue ÷ gross plant excluding work in progress) out

21. Operating revenue per connection

22. Average revenue per 1,000 gal. or m^3 sold (total and by consumer class)

23. Cash operating expense per unit of value of gross plant (exclude depreciation) out

24. Total operating expense per 1,000 or m^3 sold

25. Total employment cost per employee (salaries, wages, benefits)

26. Chemical cost per 1,000 gals. or m^3

27. Number of average days bills outstanding (bills outstanding x 365 ÷ total billing for year)

Ave days between reading & billing

28. Revenue effectiveness index

$$\frac{\text{Revenue Collected} \div \text{gross } m^3 \text{ (or 1,000 gal) produced}}{\text{Average Revenue Billed per } m^3 \text{ (or 1,000 gal)}}$$

29. Internal cash ratio

(Net operating income plus depreciation plus any non-operating net revenues, less debt service, less changes in non-cash working capital, less dividends, taxes, etc. ÷ gross plant investment, including work in progress)

Inventory level

Total annual cost/capita for water service

HShipman/JHHennings:cdd
June 18, 1973

INTERNATIONAL DEVELOPMENT ASSOCIATION | INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT | INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Department Directors and Projects Advisory Staff in Central Projects Staff DATE: January 19, 1973

FROM: A. V. Urquhart

SUBJECT: Items of Interest at January 17 Meeting of Directors and Advisers

PRESENT: Messrs. Baum, van der Tak, King, Ballantine, Evans, Fuchs, Gustafson, Jaycox, Kanagaratnam, Rovani, Sadove, Tolbert, Armstrong, Burney, Engelmann, Lithgow, Raizen, Urquhart and Willoughby

Project Monitoring Indicators

Mr. Willoughby attended the meeting and described his proposals for indicators to be used in monitoring projects' progress. He said the object was to formalize and expand on systems, which had been in use in one or two sectors, selecting 8 to 10 suitable indicators for each specific project. The indicators would be selected according to the particular problems which the project was designed to correct and would measure the progress being made against targets or forecasts. The indicators and the targets or forecasts would be agreed with the borrower either before or during negotiations. During implementation and after completion of construction, borrowers would report on progress being made; this information should also be of interest to the borrower and so should not be an undue burden. The cost to the Bank should be small.

Mr. Willoughby distributed sample lists of indicators for some sectors and asked Directors to prepare comprehensive lists of indicators for each sector from which the 8-10 for each project could be chosen. Once the lists are complete, the plan is to test them on a few projects, review the system and make modifications and then introduce them for all projects and include them in the new form being developed for reporting on supervision.

Reviews of New Procedures

Directors commented on the meetings held to discuss the working of the new procedures following the reorganization.

DISTRIBUTION: Messrs. Ballantine, Evans, Fuchs, Gustafson, Jaycox, Kanagaratnam, Rovani, Sadove, Tolbert, van der Tak, King, Armstrong, Burney, Engelmann, Lee, Lithgow and Raizen

cc: Messrs. Knapp, Baum, Alter, Bell, Benjenk, Cargill, Chaufournier, W. Clarke, Ljungh, Finne, Morra, Squire, Van Wagenen

cc: Mr. Willoughby

AVUrquhart:rw

FORM NO. 75
(2-60)

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

INTERNATIONAL FINANCE CORPORATION

INTERNATIONAL DEVELOPMENT ASSOCIATION

ROUTING SLIP	Date January 22, 1973

NAME	ROOM NO.
Messrs. Anderson, Berrie,	
Dickenson/Vasudevan, Friedmann,	
Howell, Rydell, Schkolnick,	
Shipman, Warford, Bateman,	
Miss Kelly	

	To Handle		Note and File
	Appropriate Disposition		Note and Return
	Approval		Prepare Reply
	Comment		Per Our Conversation
	Full Report		Recommendation
	Information		Signature
	Initial		Send On

REMARKS

From Y. Rovani

our file - Project Monitoring

D R A F T
1/17/73
CWilloughby

PROJECT MONITORING

One of the most significant recommendations emerging in the Colombia Evaluation Report related to Project Monitoring. From experience of the 35 projects reviewed it was suggested that "Project supervision in most fields needs strengthening by fuller information flows on project performance and more analysis of this information." The recommendation was intended to refer to projects in all sectors financed by the Bank and is hence particularly relevant to the Central Projects Staff generally. I believe this recommendation -- which incidentally seems to have been confirmed by our most recent studies -- was in line with wide-spread thinking in the Bank, as well as with efforts that were already underway in some of the then Projects Departments. I am aware of several important steps that have since been made -- for instance in connection with a number of railway projects (particularly Bolivia and Colombia) and in the form of the work Prof. John Schmidt is beginning for the Mexican agricultural credit projects. Nevertheless there still seems to be considerable disagreement about what Project Monitoring means, and it may be useful to clarify and develop at least what we meant by the reference.

For us Project Monitoring means a system of regular reporting of summary indicators about the progress of a project, generally including comparison with earlier targets or forecasts. It is neither more nor less than an information system, designed principally to meet the needs of the Bank but also of considerable use to others. I think there are five

key features to the system we have in mind. First, the indicators would be non-standardized; they would be selected to capture performance on key elements in the economic success of the particular project or in the resolution of problems identified at the time of appraisal. Second, the indicators used would be limited to 8 or 10 per project, in order to focus attention on the most important issues. Third, target levels of the indicators for, say, six-monthly periods in the future would normally be discussed and agreed at the time of appraisal and negotiations, although the system would also sometimes be used to generate information for comparison with forecasts (for example, of traffic in transport projects) or even simply to indicate trends not forecasted (for example, for sub-projects of DFCs loans). Fourth, the system for generating, assembling and summarizing the information would be agreed at the time of appraisal -- and its establishment would be integrated with any management assistance provided. Fifth, as the project unfolds, the actual values of the indicators would be reported in readily understandable form, with target or forecast values for comparison wherever appropriate, in project progress reports. Within the Bank they would be regularly given in supervision reports and probably, eventually, on the new proposed reporting form for project supervision work.

The general purpose of such a system would be more effective and cheaper project control, and improved allocation of supervision and technical assistance effort. Other specific advantages would be:

(a) to provide more objective and continuous summaries of project performance than is generally possible at present;

(b) to assist and stimulate the development and use of management information systems by borrowers;

(c) to help meet the frequently cited need of country planning authorities for information on actual performance of on-going projects.

The costs to the Bank of such a system would, I think, be relatively small. Selection of appropriate indicators and agreement on means of generating the required information should add little to the load of a modern appraisal mission. Normally these indicators would be nothing more than the pinnacle of the borrower's existing management information system. An exception might be agricultural credit projects, which raise survey, sampling and control group problems; but accumulating experience on these aspects -- for instance in the Mexican project -- should make appropiate systems easier to establish in other countries. On several of the few agricultural projects we have been concerned with we have also been surprised by the large amounts of data already collected on participating farms, and even computerized, but not always used to produce effective management reports. The point at which some additional staff-time might be required for projects in most sectors would be loan negotiations, when agreement would be sought on specific target values for at least some of the indicators. Reception and presentation of the data in the Bank could be largely handled by research assistants and should in fact reduce the supervision load on professional staff.

To clarify further what I have in mind and to indicate the relevance of such system to projects of all types, I have prepared illustrative

lists of likely indicators for several types of project -- power, highways, agricultural credit and DFCs sub-projects (Attachment II). On these lists I have omitted summary physical indicators on construction progress since these are generally already quite readily available, if not presented in quite the way I am suggesting. The indicators are generally rather composite ones, intended to reflect as much as possible outputs rather than inputs, and trends that should result from improvement programs rather than progress in implementation of such programs.

I want briefly to take a hypothetical port project to illustrate the way in which I would see the system being applied. The project covers mainly the provision of modern equipment for improved operation of the port's existing facilities. Principal items covered by the loan, made in 1973, are four dredgers, some river training works at the port access, and cranes and mechanical handling equipment at the docks themselves. The main problems identified at the time of appraisal, and which the project is intended to help solve, are: (a) bad financial situation due to tariffs being too low to cover the port's high costs, and in part also to delays in payment for port services and inadequate rentals for land and warehouses rented out to merchants and industrialists; (b) shortage of modern cargo handling equipment delaying ship turnaround time which had resulted in the imposition of a surcharge by the conference lines; (c) high proportion of time out of commission for existing dredging equipment due to inadequate preventive maintenance, workshops overstaffing and delays in supplies of spare parts from stores. The complete set of indicators selected at the time of appraisal is shown on Attachment I,

together with target values agreed at the time of loan negotiations; assuming that we are now in 1976, actual values of the indicators for the first 3 years of the project's life are also shown. It will be seen that the indicators correspond directly to key elements in the project's economic viability, to the specific problems just mentioned, and to the equipment provided. At the end of the first 3 years of the project's life traffic is somewhat ahead of forecasts, but overall financial performance, although improved, is not up to target levels. Improvement in collections and in property earnings has been significantly better than forecast. But operating performance on the port side has been disappointing and productivity has improved less than expected. The major problem responsible for this, on which it has been possible to make little progress as the indicators show, is the frequent delays that occur in provision of stores for maintenace and repair of port operating equipment and port vessels.

Many projects will of course be expected to have somewhat more delayed effects than in the case of the essentially equipment loan discussed. Many indicators may nevertheless be expected to show improvement during the course of project execution, but the forecasts and targets would clearly need to be extended to cover at least the first year or two of the project's operating life.

It seems to me that the steps that might be taken to expedite introduction of a Project Monitoring system of the kind described might be as follows:

1. Preparation of illustrative lists of typical indicators that might be expected to be useful for projects in each sector. I

should imagine that the Central Projects Staff would be able to accomplish this in a matter of weeks.

2. Insertion of a reference to the suggested system in instructions for project appraisal and supervision.

3. Application of the system to a test case or two in each sector where it has not so far been applied.

4. Review of experience of the system after a few months.

5. Adjustment of appraisal and supervision instructions to give a firmer and fuller reference to the system as modified in the light of earlier experience.

6. Revision of the proposed new reporting form for supervision to permit inclusion of target and actual values of the indicators at least for the current period.

XANADU PORT PROJECT: VALUES OF KEY INDICATORS FOR SIX-MONTH PERIODS ENDING:

ATTACHMENT I

	Unit	Actual 12/31/72	Actual 6/30/73	Forecast 12/31/73	6/30/74	12/31/74	6/30/75	12/31/75	6/30/76	12/31/76	6/30/77	12/31/77	6/30/78	12/31/78
Volume of dry cargo handled														
Forecast	mln.tons			2.9	3.4	3.5	4.0	4.1	4.2	4.3	4.5	4.6	4.8	5.0
Actual	per 6 mos.	2.7	2.5	3.0	3.5	3.0	3.8	4.3	4.7					
Average Rate of Discharge, General Cargo														
Target	Imports: ave. tons			400	460	480	550	570	540	600	610	620	630	650
Actual	per ship per day	360	340	380	440	390	480	520	540					
Dredgers' Availability Factor														
Target	% time out of			65%	70%	80%	82%	84%	84%	84%	84%	84%	84%	84%
Actual	service	76%	59%	55%	60%	83%	82%	75%	73%					
Maintenance Staff														
Target	Ave. no. per $ mln.			8.0	7.6	7.2	6.8	6.3	6.0	6.0	6.0	6.0	6.0	6.0
Actual	of gross assets revalued	8.0	8.4	8.5	8.7	8.4	8.0	7.4	6.8					
Stores Availability														
Target	Ave. no. of weeks			20	15	10	5	4	4	4	4	4	4	4
Actual	since submission of indents outstanding as of:	25	25	21	18	19	20	18	19					
Operating ratio														
Target	Op.costs inc. 5%			106	106	100	95	90	87	84	80	80	80	80
Actual	depreciation as % rev.	124	127	110	110	105	102	105	101					
Earnings from Leaseable Property														
Target	semi-annual			1.3%	3.0%	3.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Actual	net rate of return	1.4%	1.3%	1.4%	3.2%	3.6%	5.5%	6.0%	6.0%					
Collections														
Target	accounts receivable			35%	30%	26%	22%	18%	18%	18%	18%	18%	18%	18%
Actual	as % past 6 months' billings	30%	37%	37%	35%	30%	26%	20%	16%					

(as it stood in August '76)

XANADU PORT PROJECT: VALUES OF KEY INDICATORS FOR SIX-MONTH PERIODS ENDING:

ATTACHMENT I

	Unit	Actual 12/31/72	Actual 6/30/73	Forecast 12/31/73	6/30/74	12/31/74	6/30/75	12/31/75	6/30/76	12/31/76	6/30/77	12/31/77	6/30/78	12/31/78
Volume of dry cargo handled														
Forecast	mln.tons			2.9	3.4	3.5	4.0	4.1	4.2	4.3	4.5	4.6	4.8	5.0
Actual	per 6 mos.	2.7	2.5	3.0	3.5	3.0	3.8	4.3	4.7					
Average Rate of Discharge, General Cargo														
Target	Imports: ave. tons			400	460	480	550	570	540	600	610	620	630	650
Actual	per ship per day	360	340	380	440	390	480	520	540					
Dredgers' Availability Factor														
Target	% time out of			65%	70%	80%	82%	84%	84%	84%	84%	84%	84%	84%
Actual	service	76%	59%	55%	60%	83%	82%	75%	73%					
Maintenance Staff														
Target	Ave. no. per $ mln.			8.0	7.6	7.2	6.8	6.3	6.0	6.0	6.0	6.0	6.0	6.0
Actual	of gross assets revalued	8.0	8.4	8.5	8.7	8.4	8.0	7.4	6.8					
Stores Availability														
Target	Ave. no. of weeks			20	15	10	5	4	4	4	4	4	4	4
Actual	since submission of indents outstanding as of:	25	25	21	18	19	20	18	19					
Operating ratio														
Target	Op.costs inc. 5%			106	106	100	95	90	87	84	80	80	80	80
Actual	depreciation as % rev.	124	127	110	110	105	102	105	101					
Earnings from Leaseable Property														
Target	semi-annual			1.3%	3.0%	3.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Actual	net rate of return	1.4%	1.3%	1.4%	3.2%	3.6%	5.5%	6.0%	6.0%					
Collections														
Target	accounts receivable			35%	30%	26%	22%	18%	18%	18%	18%	18%	18%	18%
Actual	as % past 6 months' billings	30%	37%	37%	35%	30%	26%	20%	16%					

ATTACHMENT II

ILLUSTRATIVE LIST OF TYPICAL INDICATORS FOR PROJECTS IN SELECTED SECTORS

Electric Power

Six-monthly rate of return on average net fixed assets (agreed target or minimum)

Training Program: numbers enrolled (agreed target)

numbers successfully completing (agreed target)

Customers per Employee (agreed target)

Aggregate average outage rate on generating plant (agreed target)

Peak loads (forecast)

Industrial (and/or Agricultural) share of energy sales (forecast)

Number of new connections made (agreed target)

Average delay in connecting new customers in areas already served (agreed target)

Inventory levels as per cent of stores used in a six-month period (agreed target)

Highways

Vehicles per day (forecast)

Trucks per day (forecast)

Per cent achievement of agreed new maintenance system (agreed target)

Average maintenance expenditure per mile for paved roads (agreed target)

Average per cent of maintenance equipment out of commission (agreed target)

Number of agricultural extension workers in area traversed (agreed target)

Consumption of fertilizer in area traversed (forecast)

Volume of cotton sold from area traversed (agreed target)

Price of cotton paid to farmer at farm-gate (forecast)

Price of cotton paid to farmer who delivers to market center (forecast)

General trucking rate between points A and B on road (forecast)

Passenger bus fare between points A and B on road (forecast)

Sales tax collections in area traversed (forecast/trend)

Number of current and savings accounts in banks in area traversed (forecast/trend)

Agricultural Credit (Mainly based on Sample Survey)

Number of farms covered (agreed target)

Number of hectares covered (agreed target)

Median size of farm covered

Repayments outstanding three or more months as a proportion of total credit outstanding (agreed target or maximum)

Average net farm income of farmers covered in first year of program (agreed target)

Average net farm income of farmers covered in second year of program (agreed target)

Number of agricultural extension workers working on project (agreed target)

Gross production value of rice in region covered (forecast)

Total cattle herds on participating farms (agreed target)

Average calving rate on livestock herds covered in first year of program (agreed target)

Average calving rate on livestock herds covered in second year of program (agreed target)

Average weight of steers sold in year by farmers covered in first year (forecast)

DFC Industrial Sub-Projects (Trends, or for Comparison with DFC's Appraisal Forecasts)

Rate of Return on gross assets

Capacity utilization rate

Increase in employees

Marginal capital-labor ratio for period

Labor productivity: Gross value added per worker

Average real wages and fringe benefits per worker

Income Distribution: aggregate wages above agreed salary level plus profits as % value added

Average domestic sales price as % of equivalent import

Export share of sales

Net foreign exchange earnings on export sales

Per cent of total non-labor inputs domestic

Per cent of gross investment covered by internal cash generation

Number of shareholders

Average interest rate on debt outstanding

Debt service as per cent of total sales revenue