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DESIGN ISSUES IN PLANNING PROJECT INFORMATION SYSTEMS

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1. Introduction:

Donor agencies and aid-recipient countries generally agree that development assistance has contributed to improving economic and social conditions in many instances, but that the effectiveness of this assistance has often fallen far short of expectations. Various factors may account for mediocre or poor performance of a particular project, but the most common of these can be categorized as follows:

a) technological - the technology promoted by a project was poorly adapted or totally unsuited to the project's physical or socio-cultural environment (e.g., crop varieties which performed poorly because they are ill-suited to local soil conditions and predominant cultivation practices);

b) socio-cultural - the project failed to take into consideration the existing social systems and cultural practices of those in the project area (e.g., failure to recognize major labor constraints due to prevailing gender differences in performing of labor); and

c) policy - host country policies worked against accomplishing project objectives (e.g., price controls on major commodities subsidize urban consumers by setting low farmgate prices, hence, constituting a disincentive to increased agricultural production).

In large part, these problems are associated with poor project planning - i.e., a failure to recognize or anticipate factors which will interfere with project success. However, after project planning is initially completed, more fundamental shortcomings in the development management process involving both the donor agency and the host country have also accounted for poor project performance. Management problems can occur at any time in the project cycle - beginning with project design and continuing throughout implementation. The scale of management problems also varies, ranging from internal project management procedures (e.g., poor financial accounting), to the more encompassing institutional conditions (e.g., the incompatibility between donor management requirements and the host country's development management capabilities and indigenous organizational culture).

The factors cited above and development management deficiencies can also have an interactive effect. For example, project deficiencies stemming from technological, socio-cultural and policy factors overlooked at the design (appraisal) stage should, in principle, be identified and addressed during implementation, even if it means terminating the project. However, poor management of such projects may result in continued

implementation without corrective actions, or in the extreme cases, without project termination.

The fact that management continues to be a major problem in development projects should hardly be news to donor agencies or aid-recipient countries. Audits, evaluations and reviews of donor programs, such as the World Bank's assessment of Bank projects over the past ten years, provide ample documentation. Indeed, many donors and host countries currently support efforts to improve project management by giving greater attention to the management requirements of a project at the planning stage, providing management training to host country project personnel, and including funding for short- and long-term technical assistance from management specialists.

One area which is receiving greater attention by donors and host governments is project monitoring and evaluation. As with other aspects of development management, monitoring and evaluation has often been less useful than it ought to be. The problems donors and host countries have experienced with past monitoring and evaluation approaches are briefly summarized in the next section.

A positive result of this experience, however, is that it invokes leading to more careful thinking about what is needed for effective information systems in development projects. In particular, management information systems are increasingly viewed as one element in addressing development management problems. At the very least, if managers have adequate information about project outputs and the short-term or intermediate effects of these outputs earlier on in the implementation process, better informed decisions about the effectiveness of the project should be possible. Of course, this has long been the rationale for project monitoring and evaluation which often has not corresponded to the reality of the situation.

This paper concerns issues pertaining to the design of project information systems and monitoring and evaluation units. Several key lessons learned from past experience which should guide current information planning are cited. How those issues are addressed should, in turn, influence decisions concerning the organization of project monitoring and evaluation activities. Three alternative approaches to organizing monitoring and evaluation units are then described.

2. Summary of Problems Affecting Past Monitoring and Evaluation

In general, the experience of donors and host governments with project monitoring and evaluation is less than satisfactory. In too many cases, these systems have contributed little to project management. This experience does not question the underlying soundness of providing timely information to project managers. Rather, it points out the weaknesses of how monitoring and evaluation systems have been designed and implemented.

A number of common failings have impaired project monitoring and evaluation systems. Poor planning in many projects has led to the collection of too much data or the wrong types of data. Reliance on overly-sophisticated methods based on academic research standards for accuracy or reliability has proven unworkable or impractical in the context of development projects. Such methods have also been too expensive, too complicated given host country capabilities, and too slow to meet management's more immediate or pressing information needs. Conversely, too little attention has been given to more rapid, low cost data collection techniques which might provide timely and adequate information for project management purposes (where requirements for statistical representativeness are far less than for academic research purposes). Similarly, too much attention has been directed to data collection and too little to the analysis of that data into forms of information useful to managers.

In addition to these methodological problems, staffing and funding for monitoring and evaluation units has often been inadequate or insufficient. Technical advisors assigned monitoring and evaluation responsibilities have often lacked necessary skills or pertinent experience. Host country disinterest and/or the low priority assigned to the project information system by those responsible for implementation have also impeded effective monitoring and evaluation. Lastly, monitoring and evaluation have suffered from the negative connotations of "passing judgement" on the performance of other project components. In some cases, this has been reinforced by placing the monitoring and evaluation unit outside of project management team. This type of organizational arrangement has complicated coordination between the monitoring and evaluation unit and project management, in effect, isolating the unit from the rest of the project. (1)

3. Drawing on Past Experience: Planning More Effective Information Systems.

3.1 General Design Issues

In response to past problems with monitoring and evaluation, there has been a substantial effort to improve the utility of information systems as a management tool. Over the past several years, AID and the World Bank, for example, have produced practical guidance about monitoring and evaluation oriented to the needs of managers of development projects. (2) Much of this guidance concerns the selection and use of data collection methods attuned to the information requirements of project managers. However, this guidance also contains several key lessons based on past experience which should be considered when planning future monitoring and evaluation systems. These are briefly discussed below.

3.1.1 No Single Approach

If one lesson ought to be learned from past experience, it is that there is no single approach or methodology to monitoring and evaluation that can be applied uniformly. For example, sample surveys may be appropriate for one project, but not in others, even when the projects are of the same type. The particular circumstances, conditions, budgets, staffing, local conditions, etc. which differ among projects requires that information systems be designed on a case by case basis. In short, there are no blueprints, no cookie-cutters. Relying on a "standard formula" (i.e., the ubiquitous promise of baseline - follow-up surveys) does little more than ignore or postpone the important issue of developing an effective information system. Information planning has to be part of the design process and the information system must be treated as an integral component of the project.

3.1.2 The Problem of Causality

Until recently, monitoring and evaluation systems have been designed, either explicitly or implicitly, on the idea that the causal effects of project interventions not only could be measured, but that this causality was essential for sound monitoring and evaluation. However, the "open systems" in which development projects are implemented make it virtually impossible to control for extraneous factors which interact with the effects of project interventions - i.e., is it the project which accounts for the results, or other external factors. The response to the "open systems" problem has frequently been to use elaborate research designs to introduce statistical controls. But the major problem resulting from basing monitoring and evaluation on causal models is that it leads to sophisticated or complicated research designs and data collection methods. As mentioned earlier, this has been one of the principal reasons many monitoring and evaluation systems have failed.

In response to past experience with causal models guiding monitoring and evaluation, current thinking is heading toward a far "softer" approach to assessing the effects of project interventions. In general, guidance about monitoring and evaluation is placing far more emphasis on meeting the more limited information needs of project managers. The question of the effects of project interventions is dealt with indirectly or inferentially. For example, instead of trying to measure production increases resulting from an area development project, tracking the volume of inputs provided by local distributors or government agents and crop shipments to local and regional markets from administrative records, combined with interviews with village leaders about general production trends within the community may be sufficient to infer whether the project has had a positive effect. Similar strategies would be used for other components in the overall project information system.

The point is that causal models need not guide the design of information systems for all projects. In certain experimental or pilot projects, for example, direct measurement of project effects may be necessary (and even feasible given the more limited geographic scope of such projects). But many (if not most) projects can be adequately monitored and evaluated based on less rigorous but more practical techniques of data collection.

3.1.3 Management's Information Requirements

As a corollary to the causality issue, current guidance on monitoring and evaluation calls attention to the differences between academic approaches to social research and the information requirements for project management. In general, management and research information requirements differ on the basis of their respective time frames. Timeliness and expediency are key criteria for management purposes even if this compromises data accuracy or comprehensiveness. For research purposes, the quality of data typically has a higher priority than expedience - at least in comparison to management's information needs. However, this distinction should not be overdrawn - the difference between information for management versus research is not a mutually exclusive dichotomy, but rather a continuum. In some projects, management may require the same types of data necessary for research purposes; in other project information requirements for management and research may be quite different. The nature of the project should determine the types of information needed for monitoring and evaluation.

3.1.4 Multiple Methods/Multiple Data Sources

Monitoring and evaluation approaches in the past were often based on a key data collection system, such as annual sample surveys of residents in the project area. Information about progress toward project objectives and the effects of project interventions were largely dependent on the success of the main data collection instrument. Obviously, if the sample failed (for whatever reason and there are many), project management was left high and dry.

In response to this problem, current thinking about project monitoring and evaluation encourages the use of multiple data collection approaches. This means that rather than investing most or all of the funds available for the project's information system in a major survey, funds are used to support several data collection activities. In turn, these activities tend to be smaller in scale and much more focused than the standard household survey. For example, a sample of clients from health clinic records might be drawn to estimate distribution of services being provided. This might be combined with in-depth, open-ended interviews with a sub-sample of those selected from the clinic's administrative records. Randomly selected patients

could be asked to complete a simple form concerning the adequacy or availability of the services they received. Additional funds may be set aside for special studies to examine issues or problems which could not be identified at the design (appraisal) stage, but which surface during the course of implementation. In short, the idea is to spread the project's investment in information across an interrelated set of data collection activities employing different methods. If one of these activities fails, alternative sources of data are likely to be available to management.

3.1.5 Formal vs Informal Information Sources

Consistent with the increased emphasis on management's information requirements, methodological standards appropriate for management purposes (as contrasted to research purposes), and the use of multiple methods/multiple data sources (including informal data collection activities in project information systems) is receiving greater attention in monitoring and evaluation guidance. Informal methods refers to qualitative techniques of data collection - e.g., unstructured interviewing of project participants, field observation, discussions with individuals knowledgeable about the project and project area, etc. This type of information is often the best that can be done given urgent time constraints or limited budgets. Admittedly, there is no way of determining how accurate or representative such data are, but such data are often sufficient for management's purposes.

There is hardly anything innovative about using informal information sources - this has long been the basis of information for many project managers. The principal change has been to encourage incorporating such informal sources into project information systems in combination with other methods, rather than concentrating only on statistically rigorous data collection techniques. In fact, if used effectively, informal and formal data collection methods should complement or support each other.

3.1.6 Host Country Support and Collaboration

A major lesson from past monitoring and evaluation systems is that acceptance of the information system as an integral part of the project by the host country is important to its success. Moreover, an important objective for information systems is to also serve as a vehicle for strengthening host country institutional capabilities for data collection and analysis. In this regard, the information system and the monitoring and evaluation activities it supports depend on these activities being treated as a collaborative activity for the donor agency and the host country.

In many cases, aid-recipient countries are reluctant to support monitoring and evaluation. Budget constraints, limited local

expertise, and a general rejection of the principle of information for management purposes lead to adverse attitudes toward incorporating information systems into projects. A common "sticking point" with host countries is the use of loan funds for monitoring and evaluation activities. The connection between information and tangible improvements (e.g., agricultural production increases) is often difficult to make. From the borrower's point of view, using borrowed money for information may appear to be a bad investment.

Overcoming or modifying such resistance to project information systems is very important. The results of monitoring and evaluation often produce recommendations for actions required by the host country, or at least approval of necessary modifications to the project. It is far more likely that such actions will be taken or approved if the host country views the information used for recommending such changes as legitimate. One approach has been for the donor to use grant funds for project information systems. The importance of adequate information for project management is also reinforced by specifying that the host country will support project monitoring and evaluation activities as a condition precedent in the project agreement between the donor agency and the host country.

However, there are very definite costs entailed with emphasizing institution building as an important objective for a project's information system. Specifically, data quality and the overall operation of the information system can be compromised, sometimes significantly, as a result of inexperience or minimum skills pertaining to data collection and analysis. Ideally, the situation improves as training is provided and staff acquire the experience and skills needed. Assigning a technical advisor to support monitoring and evaluation activities during the initial years of the project is often necessary to assure that at least the minimum information requirements of the project are met.

In short, monitoring and evaluation as a collaborative activity lends credence to information and recommendations about project implementation. The collaborative approach also strengthens host country capabilities for data collection and analysis and equally important, encourages the use of information for decision making and development management. However, the costs of emphasizing institution building objectives must be anticipated and compensated for by necessary technical assistance and by using data collection and analysis methods which are within the capabilities of project staff.

3.2 Organizational Arrangements for Monitoring and Evaluation Units

The issues stemming from past experience in a monitoring and evaluation are important in planning a project's information system. This same body of experience also suggests that the

organization of monitoring and evaluation systems can affect significantly its utility for management purposes. However, current guidance focuses primarily on the content of information systems, such as useful data collection methods and offers little with regard to organizational issues and options.

Perhaps the organization of monitoring and evaluation activities has received limited attention because these decisions are largely determined by the overall management structure of the project and the locus of responsibility for implementation. Clearly, organization of an information system should be consistent with other administrative arrangements if it is to serve management's needs. This reduces the options available for organizing monitoring and evaluation activities. For example, in a project implemented by a single lead agency, the information system will typically be the responsibility of that agency's monitoring and evaluation unit. If the agency lacks a monitoring and evaluation unit, then the project can support establishing one. However, it is increasingly rare that monitoring and evaluation systems are created anew with each project. More often, project information systems must be directed through existing organizations responsible for monitoring and evaluation. On the one hand, project support can strengthen the capabilities of such units. On the other hand, poorly functioning or poorly organized units can unduly burden a project with problems which are not its own creation. Identifying and correcting these problems will be a necessary first step when dealing with existing monitoring and evaluation units.

Three general organizational models summarize the approaches used to carry out project monitoring and evaluation functions. These are: a) working through an existing permanent monitoring and evaluation unit located in a central ministry or other implementing government agency; b) establishment of a monitoring and evaluation unit as part of project management, and c) the assignment of monitoring and evaluation responsibilities to project management team without the formation of a special unit. The comparative strengths and weaknesses of these approaches are discussed below.

3.2.1 Existing Monitoring and Evaluation Units

For many projects, the implementing agency is responsible for the data collection and analysis needed for project monitoring and evaluation. As noted earlier, this typically involves an existing monitoring and evaluation unit or statistics office within the implementing agency working with or in support of the project management team. Because the capabilities of these units are usually quite limited, training and technical assistance is often necessary to assure that project information needs are met. Less frequently, projects establish new monitoring and evaluation units in implementing agencies.

The major advantages of this approach is that it provides an excellent opportunity to support institution building objectives and address a critical development management need. Developing a capacity for data collection and analysis benefits the host country through transferring or expanding a useful management technology. At the very least, it encourages better use of information for decision making, not only for the project, but for other development activities in the sector. This might include other on-going projects or future projects the host country agency will implement. This approach also maximizes collaboration on monitoring and evaluation activities.

A major disadvantage is that institution building is typically a long and slow process which can jeopardize the quality and timeliness of information produced. Moreover, in cases where an existing monitoring and evaluation unit is known to be weak and ineffective, the information it produces may lack credibility among host country managers. Reversing this situation can pose a difficult problem for the project. For example, the project may have very little control over agency staffing of the unit, or major organizational and budgetary problems may impede the operation of the unit. Working through existing units with limited capacity for data collection and analysis is also problematic for projects which have substantial information needs, such as highly experimental projects or those which might produce serious negative effects. In projects where high quality and very timely information is of high priority, working through existing units may not be the best option. Another problem of working through an existing unit can confront projects which involve more than one host country agency, such as area development projects. Locating monitoring and evaluation functions in one ministry may not be acceptable to the other implementing agencies and the information it produces might be ignored.

3.2.2 A Monitoring and Evaluation Unit within the Project Management System

Project management units which are established outside of the direct administrative control of existing ministries or agencies are a common implementation approach. In these projects, a monitoring and evaluation unit can be established within the project management system.

A major advantage of this approach is that the project does not have to cope with the problems involved with working through an existing monitoring and evaluation unit. It also allows concentrating the activities of the information unit exclusively on the needs of the project and escaping outside demands for information which can be placed on monitoring and evaluation units within government agencies. In short, establishing a project information unit increases the probability of obtaining data of acceptable quality on a timely basis. This approach is also useful in projects involving several implementing agencies.

A major disadvantage is that it reduces the opportunity for strengthening host country capabilities for data collection and analysis. In some cases, the result of establishing a monitoring and evaluation unit outside of host country agencies appears to have weakened institutional capabilities. Competent staff have been hired away from their government jobs which pay considerably less than donor-funded projects. Moreover, the work environment and other fringe benefits available from project employment in comparison to government work conditions can also be a strong incentive to leave government service.

A second weakness of this approach has been to place monitoring and evaluation units outside of the direct control of project management, in principle, functioning as an oversight operation. In these cases, the monitoring and evaluation system has often failed because it is placed in an adversarial role with the rest of the management team and seen as passing judgement on the performance of project staff. As a result, the monitoring and evaluation unit becomes isolated from the project and is of no real use to management.

These problems can be minimized. First, institution building objectives can be supported where host government staff are seconded to the project information unit on a short- or long-term basis. In this case, they are not hired by the project, rather they remain government employees. The project provide resources, training and technical assistance to work on data collection and analysis activities of mutual utility to the project and the staff person's agency. When they return to their permanent position, they have acquired or improved skills useful to their job responsibilities. Institutional capabilities are thereby strengthened, though perhaps not to the same degree as when working directly with an existing monitoring and evaluation unit.

Second, the problem of monitoring and evaluation units becoming isolated from the project can be avoided by making the unit a support service under the control and direction of project management. The unit collects and processes data needed by managers for internal monitoring and evaluation. Interim evaluations of the project are an external process involving non-project staff using data provided by the information unit.

3.2.3 Monitoring and Evaluation Assigned to Project Management

A third approach frequently used is to assign monitoring and evaluation activities to the project management team without establishing a special unit or working through a host country ministry. Under this arrangement, project staff have limited responsibility for primary data collection and analysis. The most that can be expected is that project staff will track implementation progress toward project objectives - i.e., primarily outputs and possibly some limited data on short-term

effects. More extensive data collection and analysis is performed by non-project, short-term staff, as are interim and final evaluations. Project staff may participate, but their primary responsibility is management of these activities.

This approach is advantageous when a full-time information specialist is not necessary for the project's monitoring and evaluation. Rather, specialized expertise for these activities is obtained as it is needed or to augment project personnel. Institution building for better data collection and analysis is not an objective well suited to many projects. (If it were included in every project, the monitoring and evaluation units in many countries would quickly be overwhelmed.) This approach offers a viable option for such projects. Lastly, by not having a formal monitoring and evaluation unit, costs to the projects are reduced - something especially important for smaller projects where the costs of a built-in monitoring and evaluation unit would be excessive.

The major disadvantage of this approach is that the information requirements of the project are likely to be assigned a lower priority by project staff. Meeting schedules and keeping expenditures on schedule becomes the predominant concern in many projects, and issues about overall performance and development effects can easily get lost in the crush of implementation. Project staff may also lack the appropriate skills or interest required for maintaining even a simple project information system. This type of arrangement also has a strong potential for underestimating the information requirements for sound management. As problems arise and outside specialists are brought in, the initial costs savings of this approach can quickly disappear.

4. Conclusion: No Magic Bullets

The point of this paper has been to draw attention to key issues in planning project information systems for monitoring and evaluation. How these issues are addressed will vary from project to project. This reiterates the earlier point that experience with monitoring and evaluation clearly indicates that there is no single or uniform solution to obtaining the types of information needed for sound project management. But being aware of what the pitfalls have been and what the options are should lead to better planning and, possibly, more practical and effective information systems.

Clearly, there is considerable room for improvement over the current state-of-the-art in planning project information systems. An important element in this development could be far better donor coordination. At this time, coordination among development projects which have overlapping or complementary information requirements is woefully inadequate. Granted each project has its specific information requirements, but some thought about how

project generated data could be pooled for analyses of important development constraints within a sector is certainly possible and highly desirable.

One step in this direction could be coordination among donors concerning a general strategy for supporting monitoring and evaluation within a country. Instead of each donor setting its own course, a general agreement on which level of government or level of management should be the principal channel for certain types of monitoring and evaluation information could be very productive. For example, in discussing past experience with monitoring and evaluation, Dennis Casley of the World Bank, and Robert Berg of the Overseas Development Council each raised the possibility of dividing monitoring and evaluation functions among three general levels of administration. Monitoring of implementation outputs and progress would be restricted to the project level. Periodic evaluation of project effectiveness would in general be a responsibility of sector level agencies (e.g., the evaluation unit within a ministry). Cross-cutting or multi-sectoral studies and information requirements involving the use of various types of data, such as for national policy analysis, would be a function of a central analytic office located in the planning ministry or attached to the president's office.

A division of labor of this sort offers important gains. First, this would extricate development agencies from activities for which they are ill-suited or under-staffed to perform, such as project monitoring. Second, by establishing general areas of responsibility for certain types of data and information, the corresponding expertise for that work is built-up at an appropriate level of development management. Third, resources for information would be used more effectively. At the very least, redundancy in establishing yet one more data collection unit and unnecessary competition among development projects for host country staff, resources, time, etc. would be reduced. Perhaps the same model might not work in every country, certainly there are alternatives. But a general strategy for greater coordination in this area is much needed.

FOOTNOTES

1. For a recent assessment of the World Bank's experience with project monitoring and evaluation, see "Built-in Project Monitoring and Evaluation: An Overview", World Bank Report No. 5781, June 28, 1985.

2. For examples, see D.J. Casey and D.A. Laurie, A Handbook on Monitoring and Evaluation of Agriculture and Rural Development Projects, World Bank, 1981; D.J. Casley and Krishna Kumar, Monitoring and Evaluation in Agriculture, John Hopkins University Press [forthcoming], Maureen Norton and Sharon Pines Benoliel, Guidelines for Data Collection, Monitoring and Evaluations for the Asia and Near East Bureau Projects, AID, 1985; and A.I.D. Evaluation Handbook, PPC/CDIE [forthcoming].

3. Organizational issues are discussed in a recent article by William J. Staub and Bruce Koppel, "Monitoring and Evaluation of Benefits in Agriculture and Rural Development", Asian Development Review, pp. 100-110.