

NEW ROLES FOR MONITORING AND EVALUATION IN WATER SUPPLY AND SANITATION

by

Dennis B. Warner
Manager, Community Water Supply and Sanitation
World Health Organization
Geneva, Switzerland

Introduction

Monitoring and evaluation in water supply and sanitation development generally have been viewed as activities which are costly, time consuming, and, wherever possible, avoidable. Part of this is due to methodological problems stemming from the fact that water and sanitation projects can be extraordinarily difficult to assess. Another aspect of the reluctance to undertake evaluations is undoubtedly due to a lack of willingness and capacity among development agencies to change their operations to take account of the problems revealed by project evaluations. From this standpoint, evaluations are often seen more as a hindrance than a help to efficient programme implementation.

Monitoring and evaluation are not ends in themselves, but merely means towards obtaining successful projects and programmes. The question is, what is a successful project? At the very least it should be one which produces the intended results or benefits, is sustainable over a significant period of time, and can be implemented and operated at reasonable cost.

The purpose of monitoring and evaluation, therefore, is to assist in the assessment of the relevant outcomes and associated costs. They also should provide information that can be fed back into the project to improve subsequent performance. And lastly, monitoring and evaluation may be used as a research tool to better understand the interactions and processes that take place during project development.

This paper will look at recent developments in monitoring and evaluation and, in particular, efforts to make these activities a more relevant part of the project development process through the direct involvement of the beneficiaries themselves. Through beneficiary involvement in monitoring and evaluation at all stages of the development process, it is expected that project success in terms of perceived local outcomes and system sustainability will be enhanced.

Background

Traditionally, monitoring has been viewed as the routine collection of data as a means of gauging current operational activities. In the best of situations, the information was used to influence operational changes and to

LIBRARY, INTERNATIONAL REFERENCE
CENTRE FOR COMMUNITY WATER SUPPLY
AND SANITATION (I.C.)
P.O. Box 98,80, 2509 AD The Hague
Tel. (070) 814911 ext. 141/142

RN: ISN 7950
LO: 202.5 90NE

direct maintenance works. In the worst of cases, which unfortunately occurred all too often in water and sanitation systems, the data was simply ignored because of the lack of resources for follow up actions or a lack of understanding of the importance of operational information. Evaluation, on the other hand, has been viewed as an event, an activity carried out at a set point in time to assess the status of the project or system. In most cases, evaluation has been tied to project implementation and was used to assess the developmental but not the operational phases of a project. Thus, monitoring has been viewed as a process linked to system operation, while evaluation has been perceived as an event gauging the status of project implementation.

Early evaluations of water supply and sanitation systems concentrated almost exclusively upon the public health impacts. Between 1850 and 1950, most attention was directed towards the epidemiological relationships between improvements in in water supplies and subsequent reductions in waterborne disease rates. Starting with Dr. John Snow and the Broad Street pump in 1855, through the post facto studies of the statistical relationships between the introduction of municipal water supplies and the reduction of typhoid fever in England and the United States, classical epidemiological investigations based upon the analysis of past situations dominated the general area of evaluation.

By the mid-twentieth century, however, increasing concern began to be given to rural areas having a large number of relatively isolated water sources. These areas did not fit the classical epidemiological model of a single municipal water source and distribution system. From approximately 1960 onwards, field evaluations increasingly relied upon either horizontal studies (cross-sectional comparisons of several communities at the same point in time) or longitudinal studies (time-series assessments of changes that occur in communities over time). At the same time, evaluation concerns rapidly broadened to include first economic consequences, then social outcomes, and eventually environmental impacts. Unfortunately, the 1960s and 1970s were also marked by growing frustrations among development planners and researchers because of the difficulty of showing direct causative relationships between water and sanitation interventions on the one hand and specific benefits, especially health benefits, on the other. Project evaluations, and in particular impact evaluations attempting to show ultimate health and economic impacts, tended to be either inconclusive or methodologically flawed, and most were very costly. In 1976 an expert panel of the World Bank advised against further "attempts to isolate specific causal water supply -- health relationships" within the Bank because such studies were characterized by high costs, inadequate knowledge, and poor results.

The period immediately following 1976 was a low period in the development and application of evaluation methodologies in water and sanitation. Monitoring and evaluation continued to be used by water and sanitation agencies in both the developing countries and by the external support agencies (ESAs) but rarely were these aspects an integral part of project development or long-term operations. Few new projects were ever subjected to even a cursory evaluation, while the low status of monitoring efforts paralleled the low status given to operation and maintenance throughout the developing world.

With the establishment of the International Drinking Water Supply and Sanitation Decade, 1981-1990, attention was again focused on the problems of project implementation and the all too-frequent lack of project success. New efforts were addressed first to issues of appropriate technology, then institutional development, and finally community participation. Most of these aspects had been initially developed during the previous thirty years. The Water Decade, however, brought the issues together and slowly forced development planners to begin to see water and sanitation users as equal, if not the dominant, partners in the development process. At the same time, a rethinking of evaluation approaches was occurring.

Since the early 1960s, water and sanitation evaluations had been burdened by the necessity to show causal linkages between project interventions and ultimate health benefits. Field investigations of villages and towns, however, cannot be carried out as carefully controlled laboratory experiments. There are far too many intervening factors influencing health outcomes, and an inadequate understanding of the nature and dynamics of these factors usually resulted in poor evaluation design and questionable evaluation results.

The first major change in evaluation thinking was the Minimum Evaluation Procedure (MEP) by WHO in 1983. Stating that evaluation was a systematic way of learning from experience in order to improve the planning of future projects and to take corrective action on existing projects, the MEP argued that an evaluation of ultimate impacts was not necessary for routine planning and evaluation purposes and instead called for an assessment of the "functioning" and "utilization" of water and sanitation facilities. According to WHO, functioning facilities are those which are operating in the correct way in the areas of community water supply, sanitation, and hygiene education. The utilization of facilities, on the other hand, refers to the experience of a community in actually using the water and sanitation facilities, as well as associated hygiene education messages. Measurable indicators were developed in the MEP for both functioning and utilization concepts.

Directly related to the limited evaluation approach advocated by the MEP was the growing realization that intermediate indicators of behavioral change were useful surrogates, and more easily measurable, for the ultimate health impacts of reductions in morbidity and mortality. As indicated above, most ultimate impacts, whether in the health, economic, or social spheres, take a considerable length of time to appear and usually are influenced by a variety of external factors. If it can be assumed that all ultimate impacts, or benefits, involve changes in behavior (examples: taking water from a tap rather than the stream, washing hands after defecation, paying a monthly water bill, promptly reporting system malfunctions to the local technician, etc.), then the observed presence of a positive behavioral change can be taken to be a surrogate for the ultimate health or economic benefit. Thus, behavioral changes are measurable intermediate indicators suitable for most routine monitoring as well as project evaluation purposes.

Two additional developments related to evaluation that have arisen during the Water Decade are the case-control method of studying diarrheal diseases and new ideas regarding the participation of communities in project

planning, management, and evaluation. The case-control method is an epidemiologic study of subjects randomly selected from patients in health facilities. This approach allows greater control over intervening factors, the use of more powerful statistical procedures, and significantly lower study costs. Recent ideas on user participation, on the other hand, are based on the conviction that water and sanitation system users must have greater voice in all aspects of project development and operation. Together, these newer concepts, along with the recent emphasis upon behavioral aspects, have brought the issue of monitoring and evaluation to a high level of public awareness where there exists at this time excellent potential for developing practical and effective measures for managing water and sanitation development.

The Structure of Evaluation

In the traditional sense, evaluation implies measurement, and the purpose of evaluation is the measurement of project status to determine progress toward defined project objectives. The basic evaluation process can be looked upon as a sequential model of linkages from initial project inputs to ultimate project outputs and impacts, as shown in Figure 1.

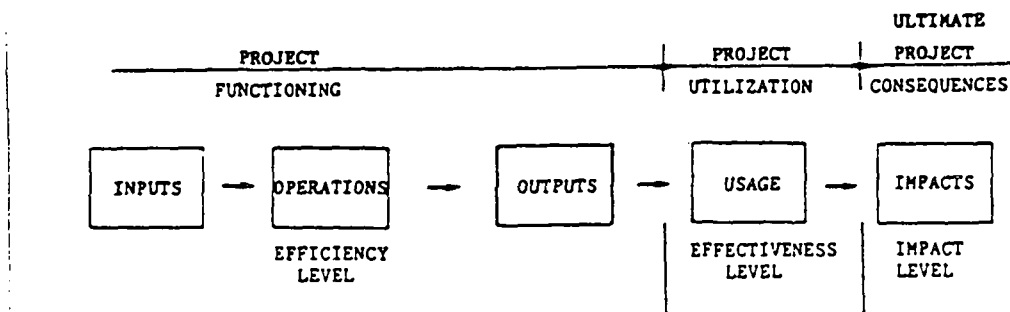


Figure 1: General Evaluation Model for Water and Sanitation Projects

Each level of Figure 1 represents an order of effects that are dependent upon all previous effects. The initial efficiency level consists of the immediate or direct consequences of project development, which include all project inputs, operations, and physical outputs under the control of project officials. The consequences can generally be assessed in straightforward physical units, such as expenditures, lengths of pipe, capacity of pumps, etc.

The secondary effectiveness level involves the more complex consequences of project performance, or the use of the project systems. This includes the water use and sanitation practices adopted by the project communities as well as the types of health education and maintenance support the communities give to the new systems. Project officials cannot directly control these consequences. They can only hope to favorably influence the behavioral patterns in the recipient communities. Although complex behavioral patterns can be very difficult to measure, simple indicators, such as the presence of soap in kitchens, the availability of water near latrines, and participation on village committees, can be used to assess behavioral changes.

The third and final level is the impact level, which includes the ultimate health, economic, and social consequences of the project. To the policy maker, these are the long-run benefits that water and sanitation projects are intended to achieve. The existence of these impacts is dependent upon the occurrence of project outcomes at the earlier efficiency and effectiveness levels. Measurement of ultimate impacts, as described above, is extraordinarily difficult, and may require a disciplined research approach with strict project controls to produce meaningful results. In the Minimum Evaluation Procedure, WHO advises against attempting to measure project impacts in operational field evaluations.

In brief, evaluation can be broken down into three basic levels: an efficiency level involving the functioning of project inputs, an effectiveness level involving the utilization of project outputs, and an impact level involving the ultimate benefits to human welfare. These levels can be further broken down into the five specific evaluation issues shown in Figure 1:

1. Project inputs (funds, personnel, materials, equipment, and labor contributions of all participants in the project).
2. Project operations (activities intended to strengthen institutional capabilities, such as the improvement of project design methods, training, research, information systems, maintenance, etc.).
3. Project outputs (construction of new water and sanitation facilities in project communities).
4. Project utilization (actual use and maintenance of water and sanitation facilities in project communities).
5. Project impacts (ultimate health, economic, and social benefits resulting from the utilization of system facilities).

These five sequential issues can be applied to an actual project evaluation, as is shown in Figure 2, which illustrates the final evaluation model for the Malawi Self-Help Rural Water Supply Program carried out by USAID in 1986. Since the evaluation was not intended as a research study but rather as an operational end-of-project assessment of a continuing programme of project development, little attention other than qualitative descriptions was given to the final level of project impacts. For the specific indicators within the operational and performance levels, however, detailed measures were used to establish the changes that had occurred since the mid-term evaluation three years earlier. Figure 2 outlines the general evaluation model but does not show the indicators used in each category. As an example of the types of indicators employed, the project utilization level (labelled in Figure 2 as project performance) contained measures and discussion of the following:

7. Project Utilization
 - 7.1 Household Water Use
 - 7.1.1 Sources and uses of household water

7.1.2 Water consumption

7.2 Household Sanitation Practices

7.2.1 Water-related uses

7.2.2 Latrine usage

7.3 Community Support Practices

7.3.1 Enforcement of water use and sanitation practices

7.3.2 Community input during construction

7.3.3 Community input for maintenance

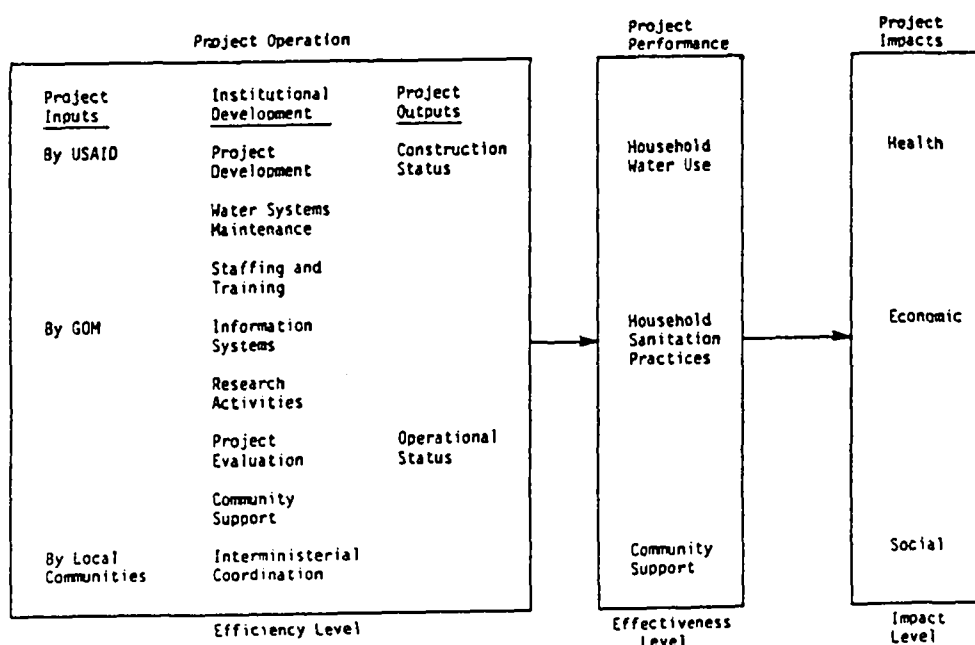


Figure 2. Evaluation Model for Malaqi Rural Piped Water Project.

With the aid of the model shown in Figure 1, an evaluation methodology may be selected that assesses the specific levels of project effects that are desired. The three most common methods of assessing water and sanitation projects are audits, process evaluations, and impact assessments. A related form of evaluation, project appraisal, is the assessment of project design before actual implementation. It occurs before project construction and, therefore, is independent of the subsequent functioning, utilization, and impact generation of actual project implementation. The three common methods of evaluation have the following characteristics:

1. Audit evaluations generally deal only with project inputs and how they have been converted into quantifiable project outputs. The most limited types, financial audits, may look only at the accounting records of budgets, billings, invoices, and

expenditures. More commonly, project audits in water and sanitation assess project compliance in terms of planned inputs and projected outputs. These evaluations tend to be highly quantitative and use specific financial and engineering criteria to measure expenditure levels, resource disbursements, facility construction, and adherence to schedules. Project audits take place during implementation or immediately following project completion, but they rarely look at secondary effects or how project outputs are utilized by recipient communities. They generally are restricted to the realm of project functioning.

2. Process evaluations are concerned with the performance of projects and how project outputs are being utilized. Project objectives regarding behavioral changes in, for example, water use, water consumption, sanitation practices, and household cleanliness become important in process evaluations. In most cases, a process evaluation must assess both system functioning and utilization. The first issue, of course, is whether the system is functioning as planned, while the second issue is whether the system facilities are being properly utilized. This latter aspect involves an assessment of the behavioral patterns and attitudes of the populations using the facilities, including the use and care of the facilities, changes in water use and sanitation practices, and types of committees and other social mechanisms for system maintenance. These easily-measurable indicators of behavioral changes do not deal directly with the ultimate benefits the project is intended to generate but do serve as surrogate measures of the ultimate impacts. Process evaluations can be carried out during project implementation, in which case the results can serve to modify project design, or following project completion, in which case the results can assist in the development of future projects. The Malawi rural water project evaluation, outlined in Figure 2, is an example of a process evaluation.
3. Impact evaluations deal with the ultimate consequences of project utilization. In general, they are concerned with long-term benefits in the areas of health, economic improvement, and social welfare. In practice, impact evaluations tend to focus on a limited set of outcomes in one or another of the above areas. The expected long-term benefits of water and sanitation projects are affected by so many internal and external factors that the overall costs of a comprehensive assessment are beyond the means of all but a handful of well-funded research investigations. Most impact assessments are basically research studies intended to test hypotheses and develop new methodological techniques of benefit measurement. Although many development organizations justify project investments in terms of expected health, economic, and social benefits, none has any formal evaluation methodologies suitable for assessing these outcomes.

New Issues in Evaluation

One of the positive legacies of the Water Decade is the growing realization that new approaches are needed to obtain successful water and sanitation projects. As the Decade draws to a close, it is increasingly clear that the original coverage targets will not be met, that the necessary financial resources to meet sector needs will not be raised, and that most projects simply are not sustainable over the long term. A variety of new concepts having relevance to both monitoring and evaluation are being used by both development agencies and ESAs to describe what the new approaches should be.

The first concept, sustainability, refers to the ability of a project to continue to provide intended benefits for a significant period of time after the completion of project construction. In some instances, sustainability is defined more rigorously to be the continuation of project-derived benefits after the cessation of external assistance. For practical purposes, this definition may be too strict, since even well-managed, user-supported water and sanitation systems may require occasional assistance from the outside. Sustainability should not necessarily be equated with full cost recovery but rather with the capability of the local socio-economic-political system to meet user needs over the long run with water and sanitation services at reasonable and acceptable costs.

The concept of sustainability derives from the basic principle that to be a success a water and sanitation system must continue to provide an acceptable level of service. The difficulty in applying this concept is due to the fact that water and sanitation agencies tend to be oriented towards construction of new facilities rather than the provision of water and sanitation services. This bias is often institutionalized within the agencies themselves as the great bulk of attention, funds, and career advancement opportunities are directed towards capital development with only residual amounts allocated to operations.

A second concept, replicability, refers to the characteristics of a project which allow it to be readily duplicated elsewhere. Water and sanitation programme development often involves the implementation of many separate projects. To the extent that a successful project can be replicated in other programme areas, costs may be reduced and overall project sustainability may be enhanced. In the 1960s, there was considerable emphasis upon the development of standard project designs intended to promote rapid programme implementation. This early approach at replicability generally was based upon standardized engineering designs, whereas the current approach to replicability generally emphasizes the software aspects of community involvement, local decision making, and institution building.

A third concept, community management, refers to the capabilities and willingness of beneficiaries to take charge and determine the nature of the project affecting them. In water and sanitation, community management implies that the community of affected users exercises both responsibility for decision making and control over the subsequent execution of these decisions

during project development. Community management is characterized by three basic components:

Responsibility. The community takes on the ownership of and the associated obligations to the system.

Authority. The community has the legitimate right to make decisions regarding the system on behalf of the users.

Control. The community is able to carry out and determine the outcome of its decisions.

Community management differs from community participation in that participation basically implies beneficiary involvement while management refers to decision-making and the execution of decisions.

And finally, the concept of participatory evaluation, or the involvement of project users in the monitoring, analysis, evaluation, and subsequent modification of their project, is beginning to be seriously considered. In normal evaluation practice, project evaluations are usually carried out at "arms length" by individuals who try to avoid directly influencing project outcomes in the collection of data and the measurement of project indicators. This classical scientific approach to assessing causes and their subsequent effects was originally developed for controlled laboratory conditions where the measurement of cause-and-effect relationships was of greater interest than the manipulation of the final effects. In free-living human communities, however, many intervening factors can influence the intended benefits arising from water and sanitation project inputs. Rather than waiting for the conclusion of formal project evaluations, information on project performance obtained from and with the assistance of project beneficiaries often can be used immediately for mid-course corrections. Such corrections, which will tend to alter the original nature of the project, will make it difficult if not impossible to carry out a traditional "arms length" evaluation. On the other hand, the involvement of the project beneficiaries in the evaluation should help to develop within them the characteristics of responsibility, authority, and control which are the essential aspects for community management. And this, in turn, is one of the approaches for promoting sustainable projects.

Geneva
26 June 1990