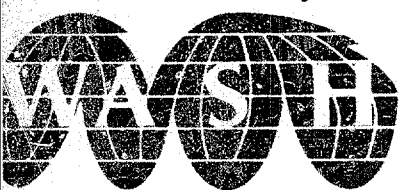


**WATER AND SANITATION  
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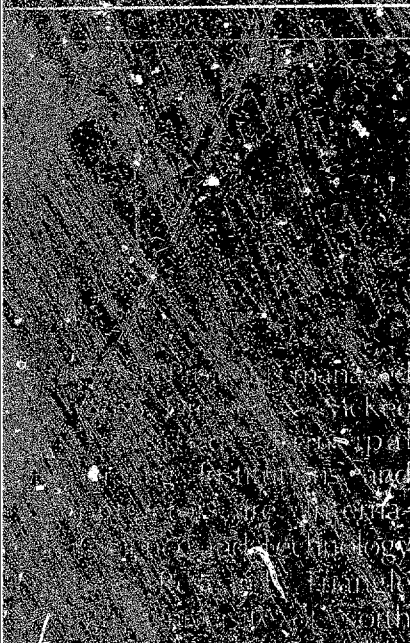


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# EVALUATION METHODS FOR COMMUNITY RURAL WATER SUPPLY AND SANITATION PROJECTS IN DEVELOPING COUNTRIES:

A Synthesis of Available Information

## WASH Technical Report No. 4

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## I. BACKGROUND INFORMATION

Although tapwater in major cities in the Republic of Malawi has been considered safe to drink, this has not been the case in rural areas (Ref. 1). Here, the majority of people have traditionally obtained their water from shallow wells and streams, which often disappear during the dry season, thereby forcing villagers to carry their water over long distances. Beginning in 1967, however, a series of ambitious self-help, rural piped water supply projects was undertaken. These systems are typically gravity-fed with sources in the waters of mountain slope rivers and streams. These projects are models of community organization and self-help. The government supplied the piping and some administrative technical assistance, but supervision and labor came from villagers themselves. These systems presently supply over 280,000 rural villagers with water piped to central village outlets; projects to serve another quarter million persons are now underway (Ref. 2).

It is useful to outline the observed reasons why these projects have developed successfully, since they will also be relevant to any future planning and evaluation efforts in Malawi. Among these reasons are the following:

- "1) The system has evolved from the bottom (sic) as a response to a real need.
- 2) The community has been involved in the project at all levels and through the whole cycle of planning, implementation, and maintenance.
- 3) As a result of this involvement and because of its basic importance to the success of the program, a sense of pride and ownership in the project is generated within the local community.
- 4) Rural communities have always been conservative and rightly cautious of innovations until they have been tried and shown to be appropriate to the conditions in which they live. It has been possible to gain the confidence of the Rural Committees,

through successful demonstration, and to involve them in a technical programme of development, which then generates confidence for future projects.

- 5) This did not, of course, happen overnight, it has taken ten years of patient understanding and persistent hard work from dedicated field staff." (Ref. 2)

The importance of the highly motivated field staff cannot be overemphasized, since these persons are the link between the government and the people and they provide the necessary supervision.\*

In addition to the rural self-help gravity-fed water system just described, similar ambitious projects to supply sanitary waste disposal have also been undertaken. At present, these projects have led to the supply with latrines for 20-40 percent of the rural population (Ref. 3). Furthermore, a large water supply sanitation hygiene project has recently been funded by U.S.A.I.D. This project will finance the installation of up to 23 rural piped water systems with the objective of providing safe water to a population of approximately 200,000, all located in the rural areas of Malawi. The basic strength of this project lies in its self-help emphasis. It will also provide funds to strengthen the Training and Research Unit in the Rural Water Section (RWS) so that baseline data can be gathered in the proposed sub-project areas. Subsequently, these quantitative and qualitative data will be available to help measure the impacts (technical, social, economic and health) resulting from the provision of safe water. Finally, this project will finance the services of a Public Health Coordinator to function as a liaison between the Ministry

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For a full discussion of these projects in Malawi, particularly from the point of view of community participation, see Glennie (Ref. 25).

of Health (MOH) and the RWS. The beneficial effects of each program would be heightened if the provision of safe piped water to the sub-project sites is fully coordinated with the MOH's programs in health and sanitation education in the same areas.

This is the background against which the needs and possibilities for evaluation of rural water and sanitation projects in Malawi should be developed. From these realities there arise indicators of what the shape of future projects should be and how one might go about evaluating them.

## II. WHY EVALUATE WATER SUPPLY AND SANITATION PROJECTS?

Water supply and sanitation development is expected to bring improvements in the success of programs in a number of areas, including health, agriculture, economic development, and social welfare. However, since projects can also have negative impacts,<sup>\*</sup> there are two general goals for evaluation:

- 1) To improve policy decisions about the usefulness and design of future water and sanitation projects.
- 2) To improve the performance of existing projects.

The focus of this review is the first of these goals, but information gleaned from a policy oriented evaluation will clearly be useful to those individuals managing ongoing projects.

There are several specific objectives for evaluation, and it has recently been recommended in this regard that devoting 1-2 percent of the total cost of a given project to evaluation would represent money well spent (Ref. 5). The scope of these objectives can be partitioned into five evaluation areas as follows:

- 1) Technical Evaluation (design and costs; operation and maintenance; use of facilities; quality of facilities).
- 2) Administrative Evaluation (design and costs; administrative capability; financial analyses, legal aspects).
- 3) Health Impact Evaluations (collection of water and use of facilities; quality of facilities; health status measures).

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\*

For a more complete discussion of this issue, see Unrau (Ref. 4).

- 4) Village Level Evaluation (effectiveness of local level organization; extension, response, and feedback; distribution of benefit).
- 5) Country Level Evaluation (how the project fits into the scheme of national development priorities).

### III. EVALUATION APPROACHES, SKILLS, AND RESOURCES

#### A. Introduction

Several recent publications (Refs. 5, 6, 14) describe, in detail, the necessary resources for evaluation of community self-help water supplies. The purpose of this section is to present an overview of the resources and skills needed for such evaluations. However, it is useful in doing so to touch on each aspect of the development of an evaluation plan in order to give the reader an overview of the entire process. It is assumed that the decision to evaluate has already been made and that an agency has been charged with the task. The initial discussion then focuses on the early conceptual stages in the development of an evaluation plan. The more practical aspects of evaluations are next developed. Finally, some suggestions specific to Malawi are offered in Chapter IV.

#### B. Conceptual Requirements

As a starting point, it is important to describe the basic conceptual requirements of an adequate evaluation. These include the following:

- 1) The goals of the project and of the evaluation must be chosen and clearly stated by those having a stake in the outcomes of the evaluation.
- 2) The criteria used to decide whether these goals have been met must be specified and agreed upon by both sponsors and evaluators.
- 3) All variables to be studied must be explicitly described and stated in measurable terms, and all measurements should be as valid as possible. This includes aspects of the intervention, the process of applying it, and the outcomes of the project.



Evaluations which satisfy these requirements are most likely to succeed.

Similarly, there are situations in which evaluations are least likely to succeed, including those carried out for purely bureaucratic, functional, political, or partisan reasons. For example, if an evaluation is planned simply to support a political group or to satisfy a bureaucratic or administrative program, there will likely be considerable inertia retarding its completion. Evaluations should therefore be undertaken only when their results can be perceived as useful in the context presented above. (Section II).

#### C. Developmental Stages

It is useful to outline the sequential development of an evaluation process, thereby providing a brief topical overview of evaluation in general, and an indication of the logical sequence of events. These aspects are presented as three phases in Exhibit 1. Each phase culminates in a product which can be the starting point for the next phase (indicated by double arrows,  $\Rightarrow$ ). Within each phase, the series of events leading to these end products are themselves also sequenced (indicated by curved arrows,  $\curvearrowright$ ). However, since there is considerable interaction among events within each phase, it is not necessary that this suggested sequence be rigidly adhered to. What is important is that each event be given consideration. This evaluation design is developed in a manner specific to water and sanitation and to Malawi in Section IV.

#### D. A Paradigm for Project Evaluation

The developmental scheme just presented can be applied to the evaluation of any social project in developing countries. This section

# Exhibit 1

## DEVELOPMENT OF AN EVALUATION PROCESS

<p>Phase I Specification of the Evaluation Topic</p>	<p>Phase II Design and Selection of the Evaluation Procedures</p>	<p>Phase III Implementation of the Evaluation</p>
<p>Specify the following:</p> <ul style="list-style-type: none"> <li>- Subject of Evaluation</li> <li>- Type of Evaluation</li> <li>- Scope of Evaluation</li> <li>- Purpose of Evaluation</li> <li>- Decision Options</li> </ul> <p>⇒ Finalize the Evaluation Topic</p>	<p>Select the following:</p> <ul style="list-style-type: none"> <li>- Organizational Plan</li> <li>- Study Design</li> <li>- Study Population(s)</li> <li>- Evaluation Criteria</li> <li>- Evaluation Measures</li> <li>- Analysis Procedures</li> <li>- Sampling Procedures</li> <li>- Data Collection Procedures</li> <li>- Data Reporting Procedures</li> </ul> <p>⇒ Finalize the Evaluation Design</p>	<ul style="list-style-type: none"> <li>Check the Feasibility of the Evaluation</li> <li>Designate the Organization of the Evaluation</li> <li>Pretest and Refine the Evaluation Procedures</li> <li>Collect, Analyze, and Report the Results</li> <li>Evaluate the Evaluation</li> <li>Complete the Findings and Recommendations</li> </ul>

SOURCE: Modified after Freeman et al. (Ref. 6).

presents a paradigm specific to water supply and sanitation projects. The paradigm, displayed in Exhibit 2, identifies the components of a community water supply evaluation and the dimensions and issues which are inherent in each component.

Before entering this discussion, several terms and concepts should be defined. Exhibit 2 divides the evaluation process into three components; function, process, and outcome. These components are often referred to as types of evaluation measures. Function measures focus on the physical system and its engineering aspects. Process measures (also called intermediate measures) deal with the use of the water system by members of the community where it is located. These first two measures are the most direct and easiest to study. Outcome measures refer to the impact of the system on its users and other members of the community where it is located.

Outcomes, such as changes in health or social functioning, are often difficult to define and measure, even if an evaluation study design is well conceived. Consequently, many questions which would be better answered with outcome measures are often evaluated using process measures. For example, it may be quite difficult to measure the loss in productivity caused by water gatherers traveling long distances to obtain water. One can, however, easily measure the savings in time and distance traveled. These savings can then be assumed to become available for more productive tasks.

In a similar fashion, some outcome measures are easier to measure than others, and practical substitutions are often necessary. For example, it has been quite difficult to measure infant diarrheal morbidity.

However, we do know that a large portion (perhaps one-third) of infant mortality relates to diarrheal diseases. Similarly, weight-faltering in infancy may be due, in large part, to diarrheal morbidity. Therefore, if a given water improvement scheme can be shown to lead to lower mortality (and an improvement in infant growth rates--also relatively easy to measure), and other factors have not changed (such as other disease rates, food availability, etc.), one is in a better position to assume that diarrheal morbidity has decreased, thus an example of an indirect health status measurement using measures more concrete than those attached to the direct outcome (diarrheal morbidity).

A logical place to begin is with the installation itself.\* Under this heading, two subcategories should be considered:

1) The design of the system and its cost -

- How many different types of designs exist?
- How many projects of each type fail to give satisfactory service, and why?
- Is any type of design giving better service than the others and why?
- Would it be worthwhile to improve any particular type of design, and how?
- How much do these systems cost to install and can this cost be reduced?
- When will the systems need replacement or overhaul?

2) The operation and maintenance of the system -

- What maintenance is needed; is it provided, and how?

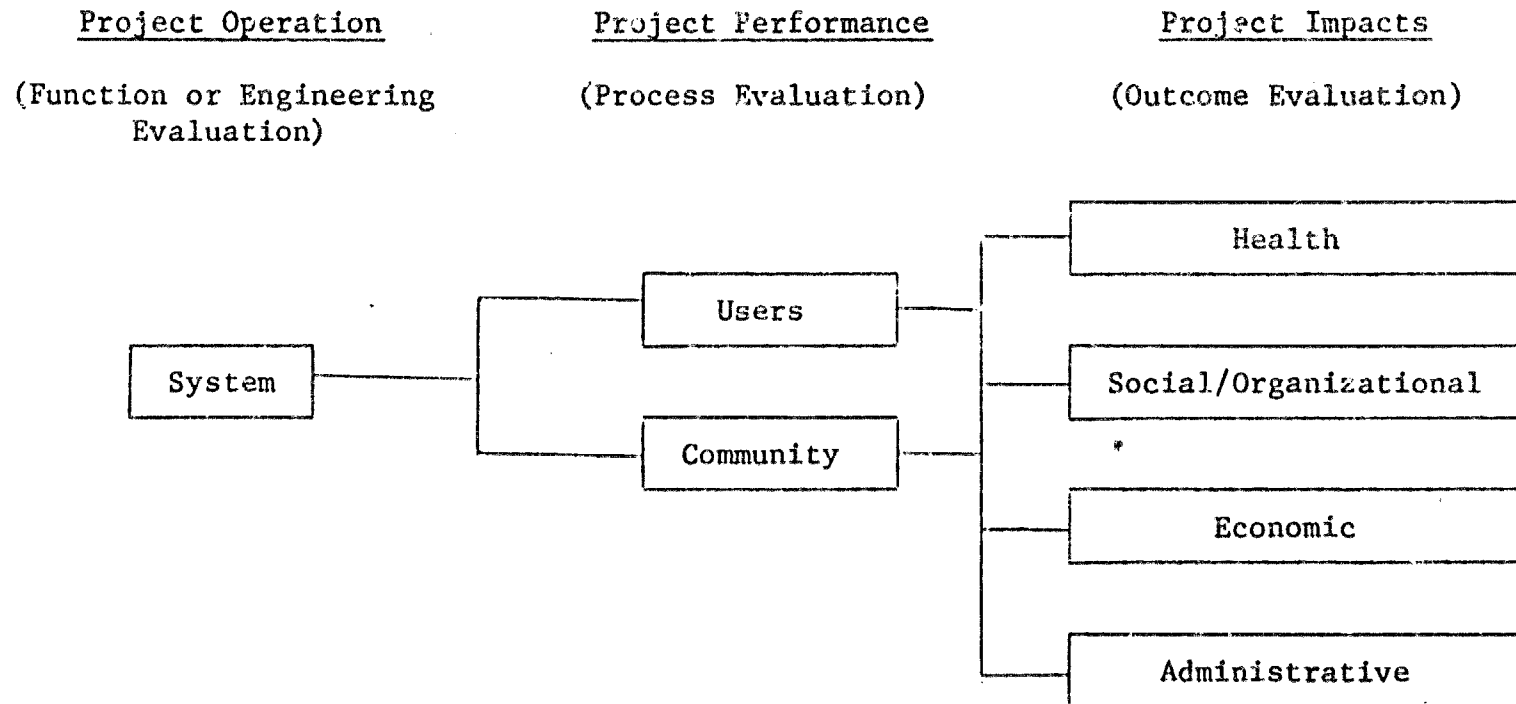
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\*

This discussion is adapted from that in Cairncross et al., (Ref. 5).

Exhibit 2

A PARADIGM FOR THE EVALUATION OF WATER SUPPLY AND SANITATION PROJECTS IN  
DEVELOPING COUNTRIES



SOURCE: Warner, D.<sup>1</sup><sub>S</sub>. (Ref. 15).

- Are these systems appropriate to the material and personnel resources available for constructing and maintaining them?
- What are the recurring operational and maintenance problems presented by the technologies used?
- Are there appropriate policy and organizational arrangements for dealing with system operation and maintenance?
- Which are the cultural, social and administrative features of a village that impinge upon operation and maintenance?
- How much does satisfactory operation and maintenance cost?
- How much can users contribute to the operation and maintenance of systems?
- How much can the government contribute?

The next component under consideration is the performance of the project. Under this heading come at least two evaluation topics:

1) Water collection and use -

- Are the facilities being used (correctly)?
- Who uses them and how often?
- Where and when are they used?
- How much time is spent in doing so and how much distance traveled?
- How is water transported and stored in the home?
- What is water used for?
- Did the presence of the new system change old patterns of water use and personal hygiene?
- What are the non-domestic uses of water, and how much is used and when?

## 2) Water quality -

- How does the quality of water differ with new sources?
- How does this quality change as water moves from the source to use?

Finally, there is the broad topic of project impacts. What are the health, social, economic, and "administrative" outcomes of the project.\* This is actually the more traditional focus of evaluations. Under this heading, at least four topics should be emphasized.

### 1. Health Outcomes

This area is extensive and technically involved, and detailed coverage of health and outcomes is beyond the scope of this review.

(For more thorough treatment, the reader is referred to the references #5,7,8,10,12,13,14,16-19.) However, a global consideration of this topic should include at least the following generic questions:

- How much disease in the study area can be ascribed to unsatisfactory water supply facilities?
- What is the impact on health of existing systems and what might be the impact of new (improved) systems?

### 2. Social/Organizational Factors

- What has been the impact of the project on village life, including aspects of agriculture, commerce, education, communication, and social, family, and political relationships? \*\*

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\* The relative merits of process vs. outcome measures are discussed further in section V, "Conclusions."

\*\* For a thorough discussion of these topics, see Ref. 22; for a similar treatment of these issues with a focus on women in village life, see Ref. 21.

- How can one account for the state of the functioning, use and maintenance of the project, especially in terms of local management, authority, and initiatives?
- What effect on the interrelationships among various levels of government has the project had, especially in terms of education, communication, and behavior?
- What are the rules and regulations that govern the use of the facilities?
- What are priorities for access and use among and within villages, and how are these regulated?

### 3. Economic Factors

- How much has been paid for the project and by whom?
- How equitable is the pay scale (if any) within and among villages?
- Are there any problems associated with payments?
- What are the effects of these projects on local, regional, and national economies?
- How do these effects vary with type of system?
- How can these effects be modified?

### 4. Administrative Aspects

- What effects have the projects had on the national, regional, and local administrative capacity and interrelationships, especially with regard to:
  - . policy making and planning?
  - . financing?
  - . legal aspects?
  - . programming and implementation?
  - . operation and maintenance?



These, then, are the major topics for consideration in any evaluation of community self-help water supply and sanitation projects. In listing these topics, an attempt was made to imply consideration of all outcomes--positive, negative, and neutral, since all such types of outcome can and do occur (Ref. 4). Any evaluation is thus best approached in a spirit of scientific impartiality. This impartiality will be more or less problematical depending on the level of staff involved. However, it should be a constant goal throughout the evaluation.

E. Personnel, Skills, and Other Resources

The personnel resources used in project evaluation include "professionals," "semi-professionals," and "non-professionals." The professional manpower needed to design and supervise an evaluation varies with the type and nature of the evaluation itself. This fact, coupled with the obvious range in the number of resources available in different areas of the world, make it difficult to establish rigid guidelines for these resources. With this in mind, general guidelines are offered in Exhibit 3. For full scale evaluations involving large government efforts, all recommended professionals (at a minimum of baccalaureate level training) should be actively engaged. For smaller, less ambitious projects, certain professionals may not be required on a full-time basis. Furthermore, professional qualifications themselves can be acquired by practical as well as academic experience, and priority should be given to using (local) professionals who can "do the job." These considerations should also guide any discussions concerning the relative mixture of foreign vs. domestic evaluation staff. The tradeoffs here between autonomy, formal

Exhibit 3

PROFESSIONAL PERSONNEL AND SKILLS IMPORTANT FOR  
EVALUATION

Focus of Evaluation	Personnel/Skills Suggested
1. Design and Costs	a civil or public health engineer and an economist
2. Operation and Maintenance	a civil or public health engineer and an economist
3. Water Collection and Use	a civil or public health engineer
4. Water Quality	a public health engineer or a bacteriologist or an experienced laboratory technician
5. Health	an epidemiologist
6. Social/Organizational Factors	a sociologist or a social anthropologist
7. Economic Factors	an economist
8. Administrative Aspects	a public health administrator or appropriate experience

SOURCE: Modified after Cairncross et al (Ref. 5).

training and willingness to publish results on the one hand and detailed knowledge of local conditions, the opportunity to train "on the job," and easier data access on the other hand, must be carefully weighed.

Concerning semi- and non-professional manpower and skills, the requirements are less formal. The expertise required for this level of staff also depends on the magnitude and purpose of the evaluation. Two groups of personnel should be considered here.

First are those persons who will actually gather the evaluation data at the village level; this group is essential for any level of evaluation. The types of individuals who are suitable for this task are:

- 1) assistant sanitarians
- 2) agricultural extension workers
- 3) public health extension workers
- 4) home extension workers
- 5) primary school teachers and/or directors
- 6) public works personnel
- 7) village health workers
- 8) mobile health teams
- 9) family planning extension workers
- 10) itinerant health workers
- 11) community development workers.\*

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\* This last group has been especially important in the water supply and sanitation self-help projects that are already underway in Malawi.

This list provides a framework for selecting individuals for local level evaluation (and for any rural organizational) activities. Of course, for certain evaluation tasks, some will be more appropriate than others. For example, health evaluation issues are typically better dealt with by those trained in (or familiar with) health matters. Again, however, for data collection in villages, the degree of contact a particular individual has with local populations is more important than formal training in any one discipline. This contact, along with the ability generally to understand evaluation issues and to gather valid and reliable data at the local level are the basic requirements for this group of individuals.

A second group of "semi-professionals" becomes important as the magnitude of the task increases, especially when an evaluation effort takes on national proportions. This group includes project administrators and persons skilled in data management and processing. Many of these individuals will already be employed in government service and may be able to spend some of their time with evaluations on an ad hoc basis. Others will need to be hired (or retrained). For a more complete discussion of this issue, especially that of personnel and resources needed for information management in rural development projects, the reader is referred to Imboden (Ref. 20).

These, then, are the skills and personnel resources needed for evaluation of water supply and sanitation projects. The physical resources needed for such work are suggested by the preceeding discussion and, again, depend on the magnitude of the evaluation effort. As a minimum, the following resources should be available:

- 1) ability to design, edit, modify and reproduce data gathering forms.

- 2) communication and transportation facilities for coordinating field efforts and centralization of data.
- 3) laboratory facilities for analysis of health and water quality measurements.
- 4) facilities for data storage and processing (computer facilities are desirable for large national projects).
- 5) existing statistics on health and other sociodemographic indices at the local, regional, and national levels (desirable but not essential-see next section) for use as baseline data.

#### IV. FEASIBLE EVALUATION METHODS

##### A. Introduction

For a thorough discussion of evaluation research, the reader is referred to the many references which have been cited (especially Refs. 5,6,7,10,12,14). For this present review, these methods are simply highlighted and discussed in the context of the situation in Malawi.

A detailed outline of an evaluation of water supply and sanitation projects has been presented in Exhibit 1. The topics of importance in such an evaluation were presented in Exhibit 2 and described in detail in the ensuing discussion. The "methods" of an evaluation actually involve each of these evaluation topics, since these factors interrelate in all phases and events of the evaluation process. The following discussion focuses on selected contents of Exhibit 1 which are important to Malawi.

##### B. Evaluation Methods

As noted in Exhibit 1, in the first phase of an evaluation, the topic(s) should be defined. The plans for more community self-help water supply and sanitation projects in Malawi suggest that an in-depth evaluation of at least the existing piped gravity-fed water supply systems and possibly of the rural latrine system should be done. The scope of this evaluation should be broad and could touch on each of the items listed in Exhibit 3. Here, there should probably be less emphasis on evaluating outcomes such as health (because of paucity of baseline data, and the inherent difficulties of evaluation of this area) (Refs. 16-18). Emphasis could instead be placed on functional aspects such as

operation and use (especially as these relate to social changes, water distribution, industry, and agriculture). The overall purpose<sup>\*</sup> of the evaluation in Malawi should be threefold: (1) to provide information for planning the future project; (2) to provide input to improve present projects; and (3) to provide on-the-job training for national evaluators. As indicated, the cost of such an extensive evaluation will be small relative to the expenditure for the projects themselves, and is likely to be well worth the investment (Ref. 5).

In phase two, the first step is to select an organizational plan.<sup>\*\*</sup> This step would involve designating an evaluation committee, composed of professionals with skills represented in Exhibit 3. A major function of this committee, in addition to (and combined with) drafting the evaluation plan, would be to consult with all involved parties, perhaps by holding regular meetings. This committee (or its chairperson--the evaluation "officer") should also prepare the final publications.

A study design should next be formalized and the study populations identified. This design could take many forms such as longitudinal, retrospective, or cross-sectional (see discussion in Ref. 5, pp. 10-11). For present purposes in Malawi, a cross-sectional design probably would be the most suitable, since the main focus would be on functional aspects of the systems and on intermediate outcomes. Indeed, such an evaluation could be designed as a component of the data gathering activities

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\* However, see the discussion in section V, "Conclusion."

\*\* Since this organizational plan in Malawi must take account of the community participation and organization in self-help water supply project, see the complete discussion and bibliography Refs. 23 and 24.

of the Training and Research Unit of the RWS (see page 2) and will provide baseline data for any future longitudinal studies. A sample of villages would be chosen for study which would be as representative of the country as possible in terms of geography, sociodemographic makeup, health status and type of system in operation. Exact statistical features of sampling and analyses are beyond the scope of this presentation (see list of "references and readings" Ref. 5, p. 22). A guiding principle should be to keep matters as simple as possible. Statistically rigorous sampling schemes often prove unfeasible for field work in developing countries. A well thought out, purposive sampling will, in any case, represent an improvement over work already being done in this field.

Evaluation criteria and measures should then be specified. The word specific should be literally interpreted here. The paradigm presented in Exhibit 2 and attendant questions/discussion provide guidelines for choosing these indices. This general outline can be supplemented by input from professionals on the evaluation committee and from consultants, both domestic and foreign (again, for details, see Refs. 5,6). However, it is important to resist pressures from other agencies to collect too much (superfluous) data, so as to reduce costs, maintain data validity, and not overtax resources.

Actual data collection procedures will combine aspects of the following:

- 1) examining existing records
- 2) samples of health indices and water quality
- 3) administering formal questionnaires



4) observation by trained workers

5) informal interviewing.

(#1 is an example of secondary data; #2-5 are examples of primary data.)

The content and proper combination of these procedures can be decided by the evaluation committee and its consultants. Finalization of criteria should occur only after appropriate pretesting of questionnaires and other data gathering instruments. Again, the community development workers, who have been so important in water supply work in Malawi, should be considered for committee consultation activities and for tasks such as pretesting and data collection. Finally, it is important that results be reported as rapidly as possible. Responsibility for this should be established early in the project. Preferably it should rest within the evaluation committee. There will be ample opportunity for scientific publications from any such evaluation efforts. Therefore, project reports should be as non-technical as possible and should be circulated (after committee and consultant review) immediately to all concerned, including government agencies at national and local levels and international aid organizations (for a full listing of "concerned parties," see Ref. 6, pp. 198-199; the same reference, pp. 201, shows guidelines for such a final evaluation report).

The actual implementation of the evaluation represents phase three and should be viewed as having several components. This phase will begin with a coordinating effort on the part of the evaluation committee with mid-level (regional) administrators and, through the latter, with

the community development workers. Next, there should be extensive pretesting, both to determine the feasibility of the project as planned and to refine the evaluation procedures. (Pretesting will also help to train field workers and estimate costs and time needed for the larger evaluation.) Pretesting, as evaluation itself, should be done in a number of geographically and sociodemographically different areas. After this pretesting and refining of procedures and instruments, the actual evaluation can proceed. As with all such projects, success will depend in large part on continued (interested) supervision at all levels. Fortunately, the success of water-related projects in Malawi sets a precedent.

Finally, results must be published and an "evaluation of the evaluation" should be considered. Actually this "evaluation" should be perceived developmentally, since lessons will be learned while carrying out the evaluation itself and these can, with proper communication and administration, be used to "fine tune" the evaluation. Indeed, this fine-tuning is often "coarse-adjustment" when it helps rescue some faltering component of the evaluation. As such, it represents as much of an attitude toward the evaluation project as a final paper describing the evaluation itself. Some factors to consider in the "evaluation of the evaluation" are:

- 1) Were the goals of the evaluation accomplished? Why or why not?
- 2) How much did the evaluation cost?
- 3) What problems (logistic, administrative, technical, legal, political, conceptual) were encountered?

- 4) Were these problems solved and how?
- 5) Could evaluation resources have been better used? How?
- 6) Would any extra resources have significantly improved the evaluation? Which, how?
- 7) How valid and generalizable are the findings? How could this be improved?
- 8) How can the results and procedures of this evaluation be used for similar existing and future efforts?

## V. CONCLUSIONS

The above presentation has highlighted the main features of evaluation methods and resources for community water supply and sanitation projects in developing countries in general and in Malawi in particular. In doing so, it was suggested that such evaluations can be designed to cost little relative to the costs of the water and sanitation projects themselves, and that the data generated by such evaluations can be extremely useful in operating existing projects and in the planning of future ones. This discussion was meant to be generally informative for developing countries, yet the treatment also focused on the needs and capacities for evaluation of the Republic of Malawi.

The author believes that a large-scale evaluation at least of the piped, gravity-fed water systems already in existence (and possibly the system of rural latrines as well) should be a government priority. The reasons for this recommendation are as follows:

- 1) the relative low cost and high benefits of these efforts.
- 2) the fact that such an evaluation has never been undertaken in Malawi, yet a large part of the rural population is supplied with self-help water and sanitation projects.
- 3) the potential impact of evaluation results from Malawi on water supply planning in other countries with similar terrain.
- 4) the major advantage of having active community development workers and committees who would greatly facilitate such work.
- 5) the imminence of further water and sanitation projects costing millions of dollars, where evaluation results could have an immediate impact.

- 6) the general interest of funding agencies in such evaluations.

As a minimum, this evaluation would focus on function and process measures (items 1-3 and possibly certain aspects of 4, 6, and 8, in Exhibit 3). These measures are the most accessible and the data generated can find immediate and practical use in both guiding new projects and upgrading existing ones.

The same cannot be said, unfortunately, for most outcome measures<sup>\*</sup> (such as most aspects of items 4-8 in Table 3). Such factors are typically quite difficult and costly to measure. The results of such work are often open to criticism and policy decisions based on these data are problematical at best. At the same time, these outcomes are the factors that have been most interesting to development agencies.

In summary, the Republic of Malawi appears to be in an advantageous position for any level of evaluation of rural water supply and sanitation projects. This advantage is especially true for evaluations focusing on function and process measures. Before extending this effort to include a detailed treatment of outcome measures, several questions should be answered. These include:

- 1) Is the government prepared to provide the resources to gather these data?
- 2) Will these data be used and how?
- 3) Can the cost of gathering these data be justified by using them in a number of ways, not simply for the evaluation issue at hand, but possibly as baseline data for future planning and evaluative work?

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\* There are two outcome measures which are, however, quite valid and relatively easy to obtain. These are mortality and anthropometry, especially in early childhood. Such measures should be incorporated into an evaluation that focuses on health outcome.

## VI. REFERENCES

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