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REPORT TO THE FILES

EVALUATION PLAN FOR THE RURAL WATER SUPPLY BOARD GOVERNMENT OF SWAZILAND

Prepared for the USAID Mission to Swaziland
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By

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GLOSSARY OF ACRONYMS

CDO	Community Development Officer
CIDA	Canadian International Development Agency
COW	Clerk of Works
EEC	European Economic Community
GOS	Government of Swaziland
KAP	Knowledge, Attitudes, Practices
MOH	Ministry of Health
NAG	National Actional Group
NGO	Non-governmental Organization
ODA	Overseas Development Authority
PC	Peace Corps
PHA	Public Health Assistant
PHE	Public Health Engineer
PHI	Public Health Inspectorate
PHI/HA	Public Health Inspectorate/Health Assistant
PVO	Private Voluntary Organization
RHM	Rural Health Motivator
RWSB	Rural Water Supply Board
UNDP	United Nations Development Programme
USAID	U.S. Agency for International Development

EXECUTIVE SUMMARY

WASH was requested by USAID/Swaziland to assist the Government of Swaziland's Rural Water Supply Board (RWSB) in developing a monitoring and evaluation system for their rural water supply, sanitation, and health projects. The RWSB has responsibility for planning, designing, and implementing water supply systems in rural Swaziland. The Ministry of Health (MOH) has had the prime responsibility of implementing the sanitation projects in rural Swaziland. Along with the responsibility the Public Health Inspectorate (PHI) of the MOH also were responsible for health education messages for proper use and storage of water and proper use and operation of latrines. The RWSB has historically attempted to link these functions through their Public Health Engineering Division. A Public Health Inspector from the MOH is physically housed in the RWSB along with a public health engineer and a technical advisor support by USAID. This team has been strengthened in their ability to link sanitation, water supply, and health education by the assignment of MOH personnel in the field to specific RWSB project sites for the duration of the water supply and sanitation construction period. These Public Health Inspectors and Health Assistants have responsibilities other than these construction projects but report to the Clerk of Works of the RWSB for that particular project.

There are several donors in the water supply and sanitation sector in Swaziland. Each of these donors has specific reporting and monitoring requirements. Some of this information affords the GOS data for planning new projects and evaluating their progress, but for the most part sufficient information is not available to assess progress and determine benefits to the rural population. The objective of this consultancy was to design a system and develop instruments to monitor and evaluate the RWSB projects. The RWSB laid down strenuous criteria. It wanted a system which could be implemented on an ongoing basis without the assistance of outside personnel and/or technical advisors. The monitoring and evaluation system is to be integrated and assimilated into the ongoing activities of the RWSB. The results and conclusions of the monitoring and evaluation system are to be shared with all levels of field and office staff and used in program planning.

The RWSB staff worked with the technical advisor and the WASH consultant for two weeks on designing an evaluation system and developing these monitoring instruments. RWSB headquarters staff were involved in this effort over the entire two-week period. Various field personnel were brought in to work with this group over the two-week period. For example, a regional Clerk of Works (COW), the Clerk of Works for Maintenance, and the Chief Community Development Officer (CDO) worked with the Planning Engineer and the Public Health Engineer on each of their respective aspects of the program. A major effort was spent in developing the household survey. This instrument was field tested by a Health Assistant in those areas where a project was proposed. Other instruments used by RWSB to monitor project progress were used as a starting point in developing monitoring reports for these evaluation systems. These reports were reviewed by personnel in the respective areas for appropriateness and ease of use.

The information identified by the RWSB is necessary for effective monitoring and evaluation of a rural water supply and sanitation project which was then organized into forms, reports, and check lists. Twenty-nine forms and reporting instruments were identified. Of these, 11 were existing forms which were deemed appropriate with no modification or change. Five of the forms or reporting instruments were existing forms which were modified to meet existing needs. The remaining 13 forms were new reporting instruments. Several of these were summary forms which analyzed and reduced field data for use by RWSB headquarters in coordination and planning of projects.

An assessment instrument was developed for determining the readiness of a community to implement a rural water supply and sanitation project. This instrument will be used by the RWSB in selecting and prioritizing communities for water projects. Guidelines for implementing this assessment were developed. A homestead survey was developed which determines the baseline conditions for each family prior to the implementation of the project. Comparison of information developed pre- and post-project on this survey will be used to evaluate the impact of the project on water use, sanitation habits, perceived health status, and so forth.

A community profile report was developed which took the individual household surveys and reduced them to a description of the entire community. This community profile represents a picture of the community as a whole prior to the project. Community participation and involvement, a necessary requirement in developing and evaluating community change, is an essential component of the project.

Reporting forms for the Community Development Officers and Public Health Inspectors were reviewed and/or developed to insure effective coordination. Plans of action for the PHI for implementing the latrine construction program in each community were developed.

The community, through the Water Supply and Sanitation Committee, plays an important role in the monitoring and evaluation of the project. This committee will monitor each step required to construct a latrine by each household participating in the program. The committee will be responsible for recording the information and reporting the status to the PHI, who is responsible for the latrine construction program in that community. The community will also be responsible for routine operations and preventive maintenance of the water system, reporting to the maintenance team on a monthly basis production, fuel costs and demands (if applicable), repairs and parts, and identifying needs for technical assistance.

A water system construction activity chart was developed. This chart identified those activities which the community performed, as well as those activities performed by the RWSB. This chart will assist in standardization of the approach and coordination of community and staff activities in the field. A monitoring form was developed to keep track of the actual cost of the projects from all sources. This, combined with forms developed by the Clerk of Works-Maintenance which monitor O&M costs by the community and by RWSB, can be used to evaluate cost effectiveness, to plan new projects, and to develop RWSB/Ministry of Natural Resource budgets.

A series of reporting instruments was developed which summarized data developed by the Clerk of Works and placed in a reduced form for RWSB headquarters. These forms report on a monthly basis the status of water systems, latrine construction, and operations of all RWSB- and NGO-constructed water supply systems.

Key recommendations:

- The RWSB should institutionalize the readiness assessment into its planning process and into NGOs' planning process to maximize sustainability of these projects.

- Household surveys should be made of each household in a project site prior to the design of a system. These household surveys should be analyzed in the form of a community profile. A follow-up household survey should be implemented within the first year of operation to assist in evaluating the impact to beneficiaries.

- The RWSB should embark on operational research to develop alternative methods for treating surface water.

- The RWSB, in coordination with MOH, should implement the PHI construction log. Along with this log the PHI should work with communities' Water Supply and Sanitation (WS&S) in implementing their latrine construction log.

- The preventive maintenance unit of the RWSB should be decentralized to allow for more effective and more responsive support of the community WS&S committee responsibility to operate and maintain their systems.

- The RWSB and MOH should focus and integrate the health education message into the implementation of their projects. All project personnel should demonstrate good hygiene and water-use practices. Efforts should be made to use the WS&S committees to reinforce these Health Education messages.

- Project implementation process should be implemented to assist in coordination of logistical requirements, such as personnel, transportation, and materials.

- Reporting on construction activity, maintenance activity, and water supply system status should be implemented and integrated into planning activities at RWSB headquarters.

- RWSB should implement the monitoring and evaluation system to increase its effectiveness, to document the impact on beneficiaries, and to provide valuable input into the next five-year planning activity.

Chapter 1

INTRODUCTION

1.1 Background

The Rural Water Supply Board (RWSB), in the Ministry of Natural Resources, Land Utilization and Energy, is responsible for the implementation of water supply in the rural areas. The Health Inspectorate, in the Ministry of Health, is responsible for sanitation and health in the rural area. Jointly, these agencies have responsibility for coordinating the integration of water supply, sanitation, and health education within project communities. The RWSB also is responsible for compliance with water quality guidelines, engineering standards and specifications, and equipment standardization.

As of 1984, the RWSB had constructed 52 reticulated macro-projects serving approximately 77,000 people and 39 micro-projects serving nearly 19,000 people. The RWSB is also responsible for rural water systems built by NGOs and PVOs which are constructed to RWSB design and equipment standards. Other systems not built to RWSB standards are supported individually with technical assistance, but are not maintained directly by the RWSB.

Sector support for the RWSB include USAID, ODA, EEC, and UNDP. The total construction cost for the 50 macro-systems supported by these donors is estimated to have been E4.55 million in 1985. USAID is also supporting NGO construction of micro-systems in 8 communities. All of these projects will be completed by June 1988. UNDP provided E1.5 million to purchase a drilling rig used in drilling 45 boreholes to be fitted with handpumps, and to assist in constructing several large piped water systems and spring protections. CIDA is presently involved in a survey of groundwater resources in Swaziland. Close coordination exists between RWSB and the Groundwater Development unit of the Ministry in placement of test holes close to identified water supply needs in the rural area. The data from this survey will be immensely valuable to RWSB in their future planning efforts.

As the program has grown and expanded in scope, and as sectoral planning has evolved, a need has arisen to monitor and evaluate the progress, performance, utilization, and impacts of activities. Several donor evaluation activities have indicated that the projects were successful in meeting goals and targets, but that insufficient monitoring information existed to allow for a diagnostic approach on how to improve the efficacy and effectiveness of the RWSB. Certain observations were made, though, by the RWSB staff which indicated a need to improve and in some cases change procedures to increase their usefulness.

Four important changes were prescribed by the RWSB staff prior to the development of an evaluation and monitoring system. These changes were the result of their informal evaluation and monitoring of their processes and procedures.

1. Decentralize the construction and preventative maintenance activity. Develop regional centers for Clerks of Works (COWs) and preventative maintenance crews.

2. Develop a closer coordination and integration with the HI in the construction of latrines and delivery of health education.

3. Insure that 60 percent of water system construction materials are on site prior to mobilization of the community to contribute their labor to the project.

4. Develop a procedure to insure that latrine construction goals are met prior to or concurrent with the development of the water system.

1.2 Scope of Work

At the request of the Swaziland Government, an evaluation/water specialist consultant was requested from WASH by USAID/Swaziland to assist the RWSB and HI in the development of an on-going monitoring and evaluation/assessment system to provide a basis for evaluation and improvement of water and sanitation sector activities. The specific areas to be considered for inclusion in this monitoring plan are listed below:

- coverage of water and sanitation supplies
- impact on health status
- linkage between water, sanitation, and health education activities
- utilization of water supplies, actual use and proper use
- operation and maintenance
- appropriateness of system plans

To fulfill the objective of developing and implementing a monitoring and evaluation system for the RWSB, the following activities were undertaken in collaboration with RWSB and MOH staff members:

1. Review project implementation and support plans in the sector including relevant long-range GOS planning documents, and reports on evaluations of specific water systems of sectoral activities.

2. Develop scope and objectives for an on-going evaluation system.

3. Design an on-going evaluation system including:

   - selection of appropriate indicators
   - selection of data collection methods
   - selection of field sampling frequencies
   - field testing of the system

4. Assist in training field staff or trainers in use of system.

5. Prepare guidelines for implementation of evaluation system.

6. Assist in early implementation and field testing of system.

7. Prepare WASH report.

Chapter 2

REVIEW OF THE PROGRAM

2.1 Introduction

The methodology for determining the monitoring and evaluation needs for the RWSB was to involve those RWSB and MOH staff members associated with various phases of project planning and implementation. Certain headquarters staff members from the Public Health Engineering and Planning Section participated in all of the activities. Section heads were scheduled to meet individually with headquarters staff, the USAID advisor, and the WASH consultant at the RWSB; an analysis was made of the step-by-step procedures that each section head goes through to implement a particular phase of the project. Specific questions were asked as to the difference between the normal procedures they follow and the procedures they would like to follow to increase efficiency and effectiveness. These procedures were then analyzed as to their anticipated impact. The results of this analysis were then formalized into the prescribed normal procedures for implementing each particular phase of the project, e.g., community mobilization, latrine construction, water system construction, etc.

After a standard procedure was established, a monitoring system was developed to track the process and to identify benchmarks for measurements and indicators for evaluations (see Figure 1). This involved sessions with each of nine RWSB and MOH personnel over the two-week period to obtain and review these procedures and design monitoring/evaluation instruments (see Appendix B).

2.2 Planning/Community Mobilization

The present process for selecting communities to become RWSB funded projects has been used since the RWSB has been in operation. Once a community has formally requested a water system either through a group of community members, a chief, or an individual, the RWSB initiates a process to determine feasibility. The most critical factor in that feasibility is the availability of a water source, either surface, groundwater, or spring. This initial feasibility study is performed by the Design section with assistance from the Community Development Officer (CDO), Public Health Engineer, Planning and Construction Engineer, and Clerks of Works, as well as the Health Inspectorate. If water is available then an assessment of the community's readiness and commitment to participate in the project is evaluated.

Prior to this consultancy this readiness assessment was performed by the CDO on an informal basis. A series of considerations went into this assessment. The CDO would arrive at conclusions as to whether he/she thought the community was ready to participate in a water supply project. Up to this time the expectations of the community, in terms of receiving assistance for a water supply, was not encouraged. A conditioning of the community was obviously occurring in terms of indicating the type and amount of community assistance that would be necessary to insure a successful project.

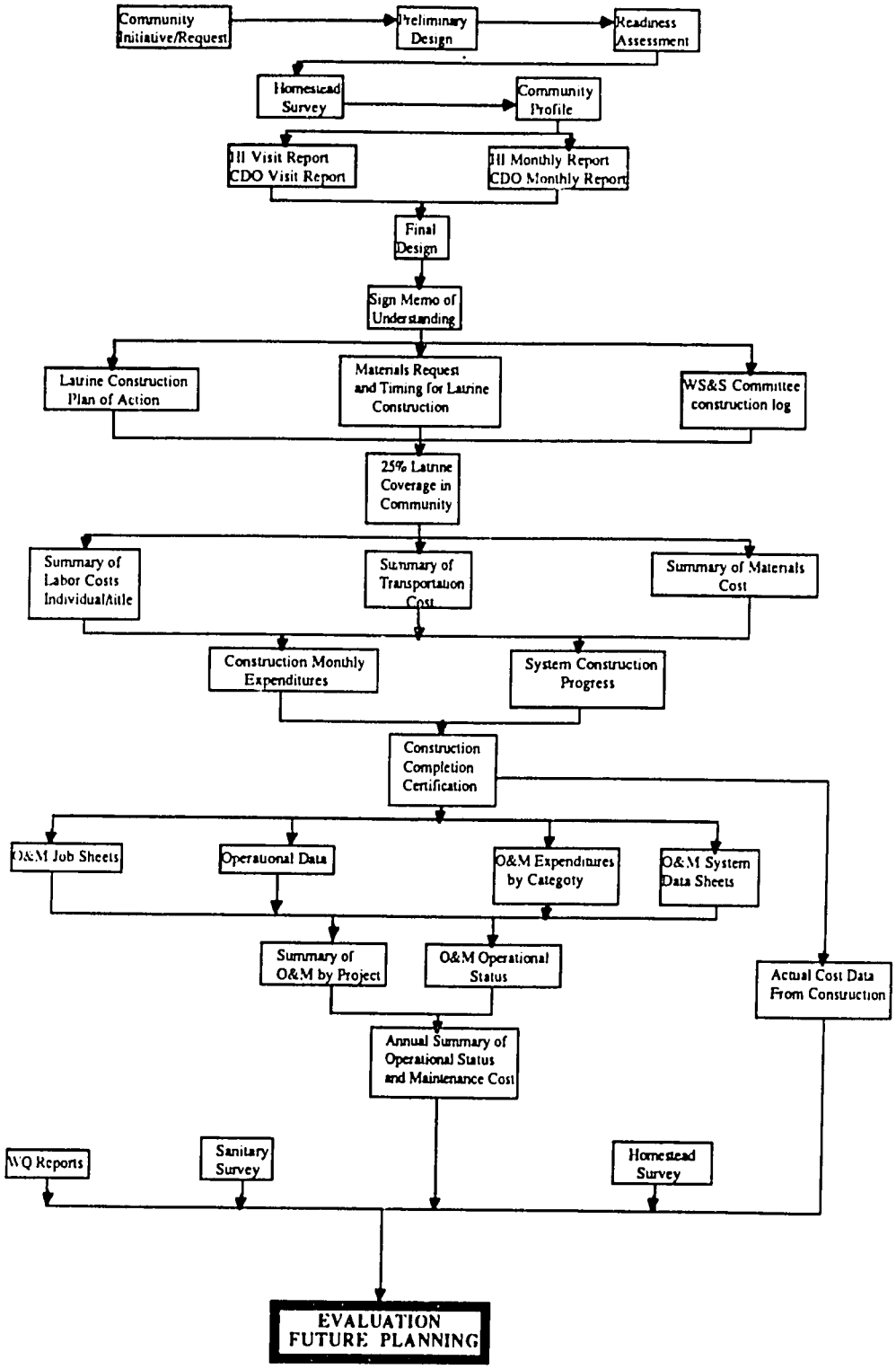

FIGURE 1 - MONITORING AND EVALUATION PROCESS COMPONENTS FOR A RWSB PROJECT

After a community was selected for RWSB assistance the CDO participated in many discussions with the community explaining what they must do to assist in the project and what role the RWSB would play in the implementation. These discussions also involved the design engineers, who begin to formulate a preliminary design of the system. Community involvement in this stage of the design process often occurs as decisions are made concerning standpost location, and so forth.

A signed agreement between the community and the RWSB represents a critical point in the process in terms of the CDO's involvement. The community has a good understanding at this point of what will be required of them, and they also know what and when the RWSB will contribute to the project. the CDO has performed a major function by this time in the process. Only if, and when, problems occur later in terms of community participation would the CDO be involved in a major way with the community. The CDO does monitor the progress of the water supply and sanitation project but in a more secondary role.

The coordination of the community mobilization is supervised by the HI in the case of latrine construction and the COW in the case of the water supply system. The COW works on a day to day basis with the community during the construction period. This would involve, for example, coordinating the trenching with the pipe installation, the site preparation for a reservoir, and building material acquisition by the community with the construction crew activities, etc. A community water committee has assisted with the scheduling and supervising of community participation in the implementing water supply projects in the past.

2.3 Health Education

The health education element of RWSB water projects was incorporated into the role the HI/HA had in pursuing the MOH's rural sanitation and water supply goals. Health education was always considered a major thrust of the community sanitation projects. The HI has an overview responsibility for all aspects of environmental health in the rural community, which includes health education. The Rural Health Motivators (RHM), rural clinics with their nurses, CDO, and radio and newspaper messages complimented these HI health education efforts.

In general, poor coordination and follow-up occurs in these health education efforts, often resulting in wasted efforts and uneven application.

2.4 Latrine Construction

Latrine construction was always a responsibility of the HI within the MOH. Various programs over the years have constructed latrines in a wide area of Swaziland. Only a limited number of these efforts were directed at attempting to cover a community with a significant number of latrines. Instead, the strategy was to place examples in as many communities as possible with the home that community members would begin to copy the concept and the technology. Certain HIs have demonstrated the ability to mobilize communities to relative high levels of latrine construction. In many cases latrines were constructed in communities without a protected water supply.

In general there was little to no coordination of the latrine construction and water supply efforts. There also was not a strategy of how and when to deliver health education message which would promote the safe use of water supply and sanitation technologies.

2.5 Design

The design of RWSB water systems has been performed by the Design unit and by certain private engineering firms in Swaziland. Some technical review has also been supplied for the USAID projects. The design process requires the design engineer and others to be involved from the very beginning, prior to the community readiness survey, all the way through the operation phase of a project. Quite often the design engineer must meet with community members to explain the capability and constraints of the system in relationship to proposed design changes. Once activity begins in a community, heightened interest is aroused concerning placement of standpipes, location of mainlines, etc. The design engineer is quite often asked to accompany the CDO to explain why community requests cannot be met due to technical constraints of the design. A considerable amount of time is required by the design engineer in meeting with communities during the construction phase of a project.

An important benchmark for the design engineers and construction COW is the certificate of completion of the project. At that time, the water system is evaluated as to its conformation to designs and its ability to produce the prescribed quantity and quality of water. After this certificate has been awarded, as-built plans are then drafted of the completed project. Complete cost data accompany the as-built plans; both are turned over to the community maintenance unit.

Chapter 3

FINDINGS OF THE PROGRAM REVIEW

3.1 Program Level

The RWSB has successfully implemented rural water supply systems for over 8 years. They have built an effective organization for mobilization communities, designing systems, constructing systems, delivering materials, and maintaining water systems. As new systems have been constructed a greater demand now exists for preventive maintenance and operations than existed in the early years of the program. This shift in RWSB emphasis along with the on-going demand for new systems has significantly increased their work load and increased the need for monitoring and evaluation. The present organization has been extended in its attempt to maintain the water system in place to date. The need existed to regionalize the maintenance function (specifically the preventive maintenance) to allow for a more comprehensive and timely cover of RWSB systems. Because of difficulty in providing preventive maintenance and supervision of community water supply caretakers, serious maintenance problems are occurring at a increasing frequency. The RWSB has proposed that regional preventative maintenance and routine maintenance crews be established. These crews will have their own transportation and will be supervised by the Clerk of Works/Maintenance from the main maintenance unit.

The RWSB has focused its effort on constructing water supply systems in the rural area while coordinating with the MOH and HI in latrine construction and health education activities. Self evaluation and national planning activities have identified the need to strengthen the linkage between RWSB and MOH and to develop procedures and methods for improving the delivery of latrines to RWSB communities and health education messages. An agreement has been reached as of July 1, 1987 between the RWSB and the MOH which would form a closer, and hopefully more effective working relationship, between these two units. The MOH will assign a HI or HA to each RWSB project to work with the RWSB's Community Development Officer (CDO), Clerk of Works (COW), and PHE unit for the length of the project. This team will be responsible to the Clerk of Works for that particular water project. The HI or HA will receive transportation support and latrine construction material deliveries based upon coordination with the COW. Prior to this arrangement these two problems were identified as one of the main constraints in not meeting latrine coverage targets.

3.2 Field Level

The RWSB needs to develop a management information system which tracks the progress of its activities and alerts supervisors to problem areas. For example at the present time the RWSB does not know how many rural water systems, micro and macro systems, it is responsible for maintaining. They also do not know the operating status of the systems which they have built. The status of any project under construction is known by the Clerk of Works and the Design Engineer but no documentation of its progress exists. In general a system needs to be developed which allows for all components of the organization to know the status of any of the project communities. There also needs to be an annual report of all RWSB system operating status.

The community operation and maintenance record keeping and reporting system needs to be redesigned and institutionalized. Even though a reporting system has been in place and has operated in the past, it is not presently supplying comprehensive and representative information to RWSB headquarters. Because of this deficiency it has been difficult to build realistic maintenance budgets and to accurately track recurring problems. This deficiency has been attributed to lack of personnel and transportation and to lack of management monitoring and control.

In the construction of water systems it was found that maintaining the momentum and community interest in a project was highly dependent on having construction materials on-site prior to the community's labor contribution. In those communities where latrine trenches had been dug, but pipe and fittings were not available for installation, serious communities participation problems could occur. If the community had to wait and perceived a loss of RWSB interest, then participation would wane. A new procedure has just been implemented, to rectify this situation, hopefully, which would require 60 percent of the materials to be on-site prior to commencing the community's labor contribution.

The construction of latrines has historically been coordinated by the HI/HA in the MOH. Each homestead participating in the program was required to contribute E10 and the labor associated with the construction of a latrine. The E10 passed into the GOS treasury and was not placed in a revolving fund for future projects. The concrete, rebar, and vent pipe material is purchased by various projects, in some cases coupled with water supply projects. RWSB can transport these materials to communities with water supply projects, for supervision of disbursement by the HI/HA. Quite often the timing and coordination of the orders for materials by the HI/HA and the delivery of the materials by the COW was poor. This resulted in poor implementation and support of community participation by certain communities and low coverage of latrines in RWSB projects.

3.3 Management

The RWSB is effectively managed and has well qualified and highly motivated personnel at all levels. Close working relationships exist between field and headquarters personnel which facilitates good communication and good control. This type of system has evolved as the organization has grown both in productivity and in scope.

Because of the increased production and scope of the organization though, certain inefficiencies are beginning to occur. It has already been mentioned that the organization has shifted emphasis from construction to operation and maintenance. In the next ten years this shift will become dominant. New projects and rehabilitated systems will always exist, but RWSB will be responsible for probably over 150 macro systems by the year 2000. An need exists to develop an O&M headquarters section which would coordinate and supervise these activities. The new regional preventative maintenance teams will greatly improve the delivery system. A similar organizational addition should be made to provide effective control and reporting. Operational research needs to be initiated immediately in exploring various cost recovery systems for the operation and maintenance of these systems.

Considerable effort is going into planning activity as evidenced by the NAG activities. Similarly within the RWSB planning activities are becoming more critical as donor activities and GOS budget constraints are balanced within the goals of the RWSB. The Planning section of the RWSB will assume many of the activities associated with monitoring and evaluation. The activation of this unit will greatly enhance RWSB management capability to control and coordinate activities in the field. Much of this work in the past was done by the PHE unit which impacted their productivity in sanitary surveys, water quality reporting, and liaison with the MOH.

3.4 Technical and Training

The RWSB staff is technically trained and experienced in all areas of rural water supply design and construction. A need does exist to introduce computer based information systems into the organization. This exercise of developing a monitoring and evaluation system demonstrated the need to install and implement a PC data processing system. A computer is also needed in the Design unit to simulate various reticulated design configurations and to aid in specification of standard materials. The RWSB staff has computer competency, but they would need some short-term orientation to the specific PC system installed. The staff would be eager to participate in this addition to their capabilities. This might also help in stemming the leakage of trained engineers to the private sector because of the increased skill building and professional career enhancement created by the opportunity to use computer aided design.

The design and construction standards for latrines needs to be reanalyzed. The existing information published by the MOH does not accurately reflect the current knowledge on how VIP latrines operate or how they should be constructed to insure their benefits. A latrine construction task force needs to be formed with the specific objective of reviewing what is known about VIP latrines and how to institute a standard within a Swaziland setting.

Chapter 4

EVALUATION INSTRUMENTS AND METHODOLOGY

4.1 Planning

4.1.1 Community Readiness

The community readiness assessment is needed to indicate the amount of support and assistance that can be expected from the community in assisting RWSB/MOH in implementing the project. A need exists within the RWSB to prioritize communities requesting assistance as the requests outnumber the institutional capability of RWSB/MOH to deliver all requested systems. The community readiness assessment will prioritize those communities in descending order of RWSB staff assessment of their interest and capability to assist in implementing a water supply system and a sanitation project.

The community readiness assessment (Form 1)* is a subjective survey of the critical factors found by 10 years of experience to affect the success of a development project in a community. Based upon knowledge of the community, interviews with Chiefs and sub-chiefs, interviews with GOS personnel involved with past projects, community members, etc., an assessment will be made as to probability that the community can participate in a self-sustaining development project.

The community development officer along with the HI will be responsible for collecting the data and making the determination. They will present their findings to the RWSB headquarters staff at that time in the planning process where communities are being selected as project sites.

The readiness assessment will be performed immediately following a request by a community for a system. If more than one year passes from the time of the initial request and assessment without a project being initiated, then a follow-up assessment will be performed. Results will generally be shared with community members not chosen for that year's funding to identify areas that need strengthening to support a water supply and sanitation development project.

A community assessment process has been formalized to assist the Rural Water Supply Board in selecting those communities which will receive GOS assistance. Prior to the development of this process community development officers would make a determination of community readiness on an informal basis. Presently there are three CDOs making these determinations and reporting this readiness status to RWSB staff meetings at those times when decisions are made as to those communities which are RWSB project sites.

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* All forms mentioned in the text appear in Appendix B.

The readiness assessment represents a unified appraisal of the community's readiness to participate in the project and the communities need for a water supply and sanitation project. This assessment will be carried out by the CDO with information gathered from community leaders, HI/HA, RHM, community committee members, community members, rural health clinics, etc. The community usually approaches the RWSB as to their desire to have a water system. These initial inquiries are analyzed by the design engineer and the community development officers as to likelihood of a water source and the needs expressed by the community. If a water source is available then this more detailed readiness assessment will be implemented. The request for water and sanitation projects outnumber the fundable projects. The readiness survey will be used to prioritize the communities, assuming that a developable water source is available.

The readiness assessment is an attempt to measure the community's interest and capability to assist in the planning, construction, operation, and maintenance of a water supply and sanitation project. Those communities which have previously demonstrated the capabilities to mobilize and to assist in their development are generally considered good candidates for other projects. The community leadership's support is another critical factor in this assessment. Other factors relating to the CDO's ability to measure the needs of the community and the use of committees in implementing development projects are important. These are 35 responses which the CDO must measure to characterize the readiness status of a community to participate in a water supply and sanitation project.

Experienced CDO's have demonstrated the ability to accurately predict those communities which are ready to be mobilized and are willing to assist in the implementation of a project. Less experienced CDOs have not had that degree of success. This readiness assessment formalized this experience and allows less experienced CDOs to be more effective. The readiness survey will serve as an evaluation indicator as the project is implemented. Evaluation of completed projects can be analyzed as their initial readiness status to determine accuracy of the assessment process. An evaluation of this process will fine tune the assessment instrument. The CDO will continue to visit the communities after they have been selected as a project community. The CDOs report on their community visitation with Form 4 and on their monthly activity with their monthly report, Form 5.

Communities which have been selected as a RWSB project must sign an agreement which encumbers their participation in the project by donating labor and local materials, and the obligation to operate and maintain the system. This signed agreement (Form 6) is signed by the authorized community representative and the chairperson of the water supply and sanitation committee.

4.1.2 Homestead Survey Form and Community Profile

Once a community has been selected as a RWSB project a community profile will be developed. This community profile (Form 3) will be produced from homestead surveys (Form 2) which will be administered to each homestead in the community. The HI/HA will be responsible for the implementation of the homestead survey. Assistance from the CDOs and other available MOH personnel will be identified as communities are selected. It is estimated that approximately 8 to 12 weeks will be required to cover all the homesteads in a community. A guideline for implementing the homestead survey has been produced to facilitate an accurate and representative collection of information from homesteads.

The initial homestead survey can be used during the project to identify specific health education messages for this particular community, and to assist the water and sanitation committee in mobilizing the community. After the implementation of a project, a follow-up homestead survey can be used to create a new community profile. A comparison of this initial and follow-up community profile can be used for evaluating the impact of a project. The community profile can also be used to evaluate any previously implemented RWSB project. Homestead surveys administered by this project can be used to evaluate performance, utilization, and certain impacts. Longitudinal comparisons between donors, types of projects, age of project, etc. can supply useful evaluation information.

A need exists presently to assess the utilization and performance of a wide variety of rural water supply projects constructed over the last ten years. Even though these historic projects will not have an initial community profile for purposes of comparison there will exist a longitudinal comparison with projects of various age, technologies, geographical settings, and donor implementation strategies.

It is thought that a statistical sample of homesteads will suffice to prepare a follow-up community profile. The number of homesteads sample will depend upon the total number of homesteads in the community. Guidelines for this sampling will be obtained from the MOH and Bureau of Statistics which have performed these types of studies.

The homestead survey will provide several categories of information on the homestead members and their activities; demographic information, health information, sources of health education messages, homestead involvement in community development projects, sources and uses of water, time of travel to water sources, home water storage practices, latrine use, latrine construction, expected use of a water system, community contribution to a water project, and assistance in constructing a latrine. There are 38 inquiries of information which go into the homestead survey. A summary and analysis of the homestead survey will be used to prepare the community profile.

Guidelines for implementing the homestead survey has been produced to assist the HI, CDOs and other GOS personnel in implementing the homestead survey. The guidelines are based upon experience gained in performing field tests in typical RWSB communities. These guidelines will serve as the basis for training personnel in implementing a homestead survey.

4.2 Community Mobilization

Once a community is selected as a project site, the CDO reinforces the requirements for the community to organize a water and sanitation committee and to determine a schedule for contributions. The CDO site visit reports (Form 4) document the level of mobilization as measured by the CDO. The Health Assistant is also active in this community mobilization. The Health assistant is active during this period of time working with the water and sanitation committee in planning and constructing latrines. The community is the prime factor in mobilizing itself to action for these projects. The community readiness survey, if correctly read, is the measure of the community's ability to mobilize and implement the project. The RWSB staff provides technical, managerial, and logistic assistance for this effort. The various monitoring documents will allow for a more coordinated and integrated effort by all active participants.

The status of any community's readiness and mobilization can be monitored by tracking field notes on the CDO's monthly report (Form 5). This monthly report will be produced from the CDO's site visit reports and observations by the CDO.

4.3 Health Assistant Visit Report

The health assistant visit report (Form 7) will be used by the health assistant to report his other activities within the project communities. Specific emphasis is given to reporting the types of activities in which the health assistant is participating with the community. Health education messages are listed to serve as a check list for his or her purpose in following a plan of action and to be used later in evaluating the success of a project based upon types and intensity of health education messages.

The visit reports are sent to the CDO and to the Clerk of Works in that region. They are responsible for supervision and integration of the MOH and RWSB personnel at a particular project.

4.3.1 Health Education Messages

The health education messages effectiveness needs to be determined as they apply to the water and sanitation projects implemented by the RWSB. The HI within the MOH, the RHM, and Health Education unit of the MOH will be responsible for the design and strategy of implementing the health education component of the project. The need exists to know which modes of delivery are effective for each of the water and sanitation health education messages. It is important to evaluate and compare the standard health education approaches with innovative means for delivering these messages.

The indicators for the health education messages will be the number of media presentations and contacts for performance and utilization measurements--long-term observed behavioral changes will be used for impact evaluation. Observed changes in sanitation habits, home storage, use of water, and bathing habits are the key indicators.

The progress and performance of health education delivery will be measured through the health assistant's visit and monthly report (Form 8). The before and after homestead survey/community profile will be used to measure user performance and utilization impacts. KAP studies are considered highly valuable by the RWSB and will be used where and when possible.

The homestead survey/community profile will be administered by the HI with assistance from the CDOs and other MOH personnel. The HI representative working with the RWSB personnel will be responsible for data collection and analysis. The visit reports and monthly reports by the HI/HA will indicate who will receive which health education messages. This information will be advanced to the regional Clerk of Works in RWSB and to the Senior Health Inspector in the MOH.

4.3.2 Latrine Coverage

A need exists to monitor and evaluate the institutional arrangement which couples MOH and the RWSB in the construction of latrines in those communities receiving a water supply from the RWSB. A new arrangement has been established which is expected to improve the effectiveness of the latrine construction activities. This information will also be useful in determining the actual coverage of latrines in those communities which can be used in national planning efforts. The monthly reports will track community progress in latrine construction (Form 8).

The initial condition of a community in terms of latrine coverage will be described in the community profile. Since the community profile (Form 3) is a summary of homestead surveys an accurate baseline condition exists for all project communities. This survey includes questions on latrine type and use. The community water and sanitation committee, with assistance from the HI and CDO, will develop a plan of action for construction of latrines (Forms 9 and 10). It will be the responsibility, as supervised by the HI, of water supply and sanitation committee to monitor the phases of each homesteads latrine construction process (Form 11). The WS&S committee will also be trained to deliver the public health messages to the homestead members and to monitor proper use of latrines.

The follow-up homestead survey will be used to measure the change in coverage of latrines and the effectiveness of the health education messages as they apply to sanitation.

The HI/HA and CDO perform the pre-project and post-project homestead surveys. The community water supply and sanitation committee will monitor the progress of homestead latrines construction. The HI/HA's visit (Form 7) and monthly report (Form 8) will note the community's progress in latrine construction, the need for cement, rebar, and vent pipe, and the public health messages delivered by the HI.

The preliminary surveys for all existing RWSB should be finished by September 1, 1987. Existing project homestead surveys should be made on as many past projects as possible. Latrine coverage from these projects will be extremely important information in comparison with the new projects.

4.4 Design and Specifications

The design approach used by RWSB is of a high professional quality. The monitoring requirement for this phase of the project is needed more by the RWSB management to evaluate their design and construction standards. Local considerations are included in all designs as identified initially by the CDO and later by the design teams. The design teams also play an important role during the construction period as redesign issues come up or as the beneficiaries identify new needs or new constraints. The design engineers can assist the CDOs and HAs in answering community questions and concerns about the system as it is being constructed.

The list of specified materials for the project is found on Form 12. This material list is necessary for the CDOs and HAs to assist in mobilizing the community. This information will also assist in the future planning of projects as cost data is developed.

4.5 Water System Construction

Once a water supply system has been designed, a list of materials is developed with their respective specifications (Form 12). A need exists to monitor and evaluate the timing and coordination of construction material on-site, new construction activities, transport, and community participation (Form 13). The Clerk of Works and Community Development Officers will use this information on a weekly basis to supervise and manage the construction process, measure progress, and identify constraints. An evaluation of this monitoring system will be used by the Design and Planning sections to check their assumptions on scheduling and choice of materials (Form 12) and equipment.

The indicators for this schedule will be the times established for the completion of major activities associated with the construction. An estimated start and finish date for each activity with monthly update of percent of activity achieved. A chart showing water supply construction tasks will be plotted on a monthly basis for each project by regional COWs. The regional COW will obtain information from construction crews, CDOs, and HI/HA to update this chart. A copy of the monthly report will be forwarded to the Design and Planning sections. Each project will have a construction activity status chart. These charts will be used by RWSB headquarters to identify problems and to coordinate activities.

The total cost of a construction project for all participants (GOS, donor, and community) is tracked by a series of monitoring reports. Forms 12-16 monitor the labor costs and transportation costs for each water system project. Accurate data on the cost of various types of water systems are critical in evaluating the donor and GOS investments (Form 17). Comprehensive data on the cost to construct systems will assist program development in the sector.

4.6 Operation and Maintenance of Water and Sanitation Systems

The key to an effective community-based operation and maintenance system depends on the commitment of community members to the entire project planning process through operations. The RWSB has established an approach to fostering this commitment, starting with the readiness survey and carrying through to the community's involvement in the construction of latrines and the water system and the operation and maintenance of the water system. The RWSB will work with each community on an ongoing basis to maintain these systems by having parts available and mechanics on staff to perform the more difficult maintenance steps.

The community's obligation in this process is to monitor the status of the system, (Form 18). Information regarding the operating status, water production fuel or electricity consumption, etc., is monitored in this form. This information is reviewed monthly by the COW/Maintenance (Form 19) to schedule crews and to maintain a parts inventory for each region (Forms 20 and 21).

A work form for each project (Form 20, needed assistance) will continue to be used. This form becomes the basis data for building inventory files and for use in developing good O&M cost data.

The operating status of the project will be advanced to the RWSB management by use of Forms 21, 22, 23,and 24. An annual O&M Survey and Status Report (Form 25) will be prepared by the RWSB director to assist in monitoring project targets and coverage. The O&M Summary form aggregating expenditures by categories, Form 23, will be used by the COW/Maintenance to develop regional budgets and RWSB budgets. Eventually this information will be used to develop baseline data for determining alternate strategies for service fees for RWSB water supply systems.

4.7 Water Quality

The water quality monitoring and evaluation needs are directly related to public health issues. The need exists to determine the bacterial, chemical, and physical characteristics of water supplied by RWSB systems (Form 29). This is a critical component of on-going operations as they relate to the public health and safety of the raw water source and the integrity and operation of reservoirs and reticulated systems. Adverse changes in the water quality would signal a sanitary survey and a possible technical upgrade to insure that safe water is delivered to community members. Water quality data can also be used to measure the variations in potability of traditional sources of water compared to a RWSB system. From a policy standpoint these data have been used to establish water quality guidelines for Swaziland which are appropriate and achievable. The design unit of the RWSB needs to have system performance date to check their assumptions on design and construction of water systems.

The indicators for water quality monitoring and evaluation are total and fecal coliform, turbidity, color, conductivity, hardness, dissolved solids, pH, chlorides, and nitrates. Other parameters are included in certain analyses if more information is required on the constituents of the water.

Water quality analyses are performed by the RWSB personnel in Matsapha. The water quality laboratory is part of the Public Health Engineering section of the RWSB. The laboratory unit is responsible for sampling RWSB systems. A goal has been set to sample all new systems once a month for the first year, and quarterly thereafter. An annual summary of each water system will be available for use by the Public Health Engineer.

4.8 Project Management

The RWSB staff is active at all levels of project implementation in the water supply and sanitation sector. The RWSB and MOH staff activity, coupled with the lack of transport to the field, creates a management problem due primarily to the lack of information. These monitoring and reporting forms, if properly implemented, will greatly assist the management of the RWSB. The key to this function is insuring that reports are accurate and timely and are used in the decision-making process of the board. If this monitoring is viewed as just more paper work, then little improvement can be expected. If, instead, the information gleaned from the reports is viewed as needed, then project management can be improved.

4.9 Performance

The performance of the water systems under RWSB's jurisdiction will be monitored with Form 27. This summary of systems will be summarized for an annual report (Form 28), which can be used to update the five-year WS&S plan. This report, coupled with the annual sanitary survey (Form 26), will track the performance and utilization of each RWSB water supply system. It is absolutely critical that these annual summaries and surveys be completed before any extensive planning is undertaken. This performance data will be required to project new targets, to select appropriate technologies, and to develop budgets for GOS and for donors.

A summary of performance data will be generated from forms listed below:

Performance	Form Number	Responsibility
Quantity	Homestead Survey (2) Sanitary Survey (26)	PHI PHE
Quality	Water Quality (29)	PHE
Reliability	Summary of O&M (25)	COW/Maintenance WS&S Committee
Convenience	Homestead Survey (2)	PHI
WS&S Committee Functions	Health Assistant Reports (7,8)	PHI
Community Participation	Health Assistant Reports (7,8)	PHI
Latrine Construction	Latrine Construction Workplans (9,10) WS&S Committee Construction Progress Report (11)	PHI WS&S Committee
Number Reached through Health Education	Health Assistant Monthly Activity Report (8)	PHI

4.10 Utilization

The factors which effect the utilization of water from a RWSB system, such as quantity, distance, and other sources, need to be evaluated. This information can assist in the planning and design of new projects.

Follow-up homestead surveys will be the source of this information. The annual sanitary survey (Form 26) will also provide data for this evaluative factor. These follow-up homestead surveys should be samples from the community rather than interviewing households.

Utilization	Form Number	Responsibility
Water Quantity Used and Determinants	Homestead Survey (2) Sanitary Survey (26)	PHI/CDO PHE
Quantities Used for Different Purposes	Homestead Survey (2)	PHI/CDO
On-site Storage/Retrieval	Homestead Survey (2)	PHI/CDO
Quality in Homes	Water Quality Report (29)	PHE
Utilization of Latrines	Homestead Survey (2)	PHI/CDO
Condition of Latrines	Homestead Survey (2) Sanitary Survey (26)	PHI/CDO PHE

4.11 Impact

The RWSB has developed a policy in designing their project monitoring system which does not require any outside assistance in implementation. Their policy is based upon their need to be totally self-sufficient in all phases of project implementation as soon as possible. All of the reports developed by the RWSB are implemented by the community or by RWSB and/or MOH. The baseline data for each community, prior to a water and sanitation system, is captured in the household and community survey forms. A follow-up of a sample of each project community will describe the impact the WS&S project has had on the community. The important consideration for impact evaluation is the fact that all baseline information (prior to project implementation) will exist. A series of KAP surveys within the same community will be useful in determining long-term behavioral changes attributed to the project.

Utilization	Form Number	Responsibility
Time Saving	Homestead Survey (2)	CDO/PHI
Health/Water Borne Disease	Sanitary Survey (26)	PHI
Agricultural Production	Homestead Survey (2)	CDO/PHI
Community Development	CDO Monthly Report (5) PHI Monthly Report (8)	CDO PHI
Role of Women	CDO Monthly Report (5) PHI Monthly Report (8)	CDO PHI
Institutional Strengthening	Program Status Report (28)	RWSB Staff
Government Budget	Annual Plan	RWSB Staff
Prioritization	Annual Plan	RWSB Staff

4.12 Implementation of Evaluation System

The RWSB headquarters staff reviewed the monitoring and evaluation system developed with representatives of the RWSB section heads. A schedule was then developed for the full implementation of the system beginning with certain activities which were to be completed the week after the consultancy was finished the activities and suggested dates were then placed on a calendar based upon RWSB information needs over the next year (Table 1). The need to have the monitoring and evaluation system on line and operating as early as possible was an overriding consideration. The need to have as much information as possible concerning the progress, performance and utilization of RWSB projects for the next major 5-year planning activity (in August 1988) was another major consideration.

The homestead survey forms were field tested at two different locations during the two week consultancy period. MOH personnel were trained in its use and were developing guidelines for use in the field. It is anticipated that the homestead and community survey forms will be finalized and printed to allow for their use by July 17, 1987. These forms will also be translated into SiSwati to permit use by RHMs.

There are several RWSB projects which are at the right place in terms of planning for the use of the homestead and community profile. There are several past projects where information in needed which will also be surveyed immediately.

The latrine construction plan of action and community water supply and sanitation log will be introduced to the HI/HAs by July 17, 1987. The Clerk of Works will be trained in the use of these forms in ordering latrine construction materials. The Senior HI will be responsible for training the HI/HA in the use of the forms.

The existing CDO reporting requirements will be maintained. Upon analysis it was found that these reporting instruments are being used by field and supervisory personnel and are effective management tools. In fact, the HI/HA reporting system was in part modeled after the CDO system because of its effectiveness.

The new visit and monthly reports will be in place at communities where linked projects are in progress by the end of July. The senior HI will be responsible for training and institutionalizing these new reports. RWSB staff members will assist in training of HI personnel in the use of these reports, specifically as they apply to latrine construction activities and community participation in the construction of water systems.

Maintenance forms will not be fully institutionalized until regional maintenance centers are developed. At present information reporting requirements are constrained by lack of transportation. The Clerk of Works for Maintenance will train all personnel in the use of these reporting instruments and will work them into the system as the regional systems are developed.

Table 1

Plan of Action for Monitoring and Evaluation Activities

ACTIVITY	RESPONSIBILITY	TARGET DATE
1. Field testing homestead and readiness survey	HIs, Asst. CDO, Interviewer	6/7/87
2. Training HA and a CDO to implement homestead survey and community profile	HIs in district RHI, Senior CDO	13/7/87
3. Training Asst. CDO's to implement readiness survey	Senior CDO	13/7/87 4 systems Ngcina, Ensingeni
4. Implement homestead surveys and community profiles	Asst. CDO, HI/HA HI/PHE	17/7/87
5. Implement readiness surveys	CDO	10/7/87
6. Latrine construction Plan Action and WS&S committee log	HI WS&S committee	17/7/87
7. CDO visit and monthly reports	CDO, Asst. CDO	On-going
8. HA visit and monthly reports	HI, HI/PHE	6/7/87
9. Maintenance monthly reports	COW/MAINT.	On-going
10. Construction monthly reports	COW, DE	6/7/87
11. Inventory of RWSB systems	PHE, HI/PHE	1/6/87
12. Follow-up homestead surveys	HI & Asst. CDO 8 initials 4 follow-up statistical	1/6/87
13. Evaluation analysis performance	PHE, DE, COW/MAINT. HI/PHE	1/6/87

Table 1 (continued)

14. Evaluation analysis utilization	HI/PHE, PHE	1/8/87
15. Evaluation analysis impact	HI/PHE, PHE	1//8/87
16. Evaluation analysis cost	DE, PE	1/8/87
17. Water quality reporting	PHE	1/8/87
18. Sanitary survey	PHE, HI/PHE, HI, 10 systems/Yr	1/7/87

An inventory of all existing RWSB micro and macro water systems will be completed prior to the planning activity scheduled in August of 1988. Several attempts have been made in the past to bring the inventory up to date. The HI/PHE will be responsible for collecting the information and preparing a status report of existing systems.

The information collected in the reporting instruments listed above will be used to perform an evaluation on the progress, utilization, performance, and impact of the RWSB projects. Based upon approximately 9 months of monitoring data, these reports will be prepared in June of 1988 prior to the master planning activity. The Planning and Public Health Engineering units will be responsible for these activities. An annual water quality report on all systems will also be coupled with the inventory report. The PHE unit will be responsible for the preparation of this annual report.

The Design Unit will prepare a summary of all systems constructed this year 7/87-6/88. This summary will be used in project planning, in preparing proposals for donor support, in preparing GOS budget requests, and for use in the master planning activities. The Design Engineer will be responsible for this evaluation.

Chapter 5

RECOMMENDATIONS

5.1 System Planning

5.1.1 Program Level

1. RWSB should incorporate the readiness assessment into their prioritization process for future projects. This should increase the number of successful projects over and above the already high number of successful projects, and provide documentation in connection with donor-funded projects.

2. RWSB should require that NGO's also incorporate the readiness survey into their process of selection and their prioritizing water and sanitation project.

3. RWSB should assign principal responsibility for monitoring and evaluation to the newly filled planning section engineer. Since the ultimate value obtained from a monitoring and evaluation program lies in the planning of programs, projects, and budgets for the RWSB.

4. RWSB should develop a planning and community mobilization process for rehabilitated systems which incorporates solutions.

5. All GOS ministries and offices should be responsible for their component of a rural WS&S project in terms of monitoring and evaluation. These responsibilities are summarized in Figure 2.

5.1.2 Field Level

1. Readiness survey should be performed on all requests for water supply and sanitation projects.

2. A project log and file should be started for each request made to RWSB. This file should be kept by the Planning Unit of the RWSB.

3. Yearly reports should be made by NGOs to the RWSB planning unit updating the status of each of their micro systems.

4. A monthly meeting should be scheduled by the CDO to coordinate and update the design, planning, and public health unit on each on-going project. The HA and CDO monthly reports should serve as the basis for these meetings. The emphasis should be on team building, coordination, and on achieving a common goal.

GOVERNMENT OF SWAZILAND MONITORING AND EVALUATION RESPONSIBILITIES FOR RURAL WATER SUPPLY PROJECT

Gov't Ministry/ Office	PLANNING	MOBILIZATION	CONSTRUCTION		OPERATION & MAINTENANCE
			LATRINE	WATER	
Community Development	Preliminary Design Readiness Survey	Visit Reports - Monthly Reports Homestead Survey - Community Profile - Final Design - Sign Memo of Understanding		Construction complete certificate	Operation Data Follow-up Homestead Survey
Health Inspectorate	Preliminary Design Readiness Survey	Visit Reports - Monthly Reports (HE Homestead Survey - Community Profile - Final Design - Sign Memo of Understanding)	Plan of Action (develop) Material Request & timing for latrine const. WS&S committee constr log		Follow-up Homestead Survey
Design	Preliminary Design	Final Design Sign Memo of Understanding		Const. completion certificate - Cost data from const. - Unit cost of processes	
Public Health	Preliminary Design	Final Design Sign Memor of Understanding		Construct. complete. certificate	Water Quality Reports Sanitary Survey
Planning	Preliminary Design				Operation data from regiona and O&M Central - O&M expenditures by category - Summary of O&M by project Annual summary of oper. status and maint. const.
Clerk of Works Construction	Preliminary Design	Final Design Sign Memo of Understanding		Summary of labor cost-individual Summary of labor cost-time Const. mo. expend. Summary of transp.cost Sys. constr. progress Constr. compl. certif.	Operation data - prev. maint. in region O&M expenditures by category O&M system data sheets O&M job sheets O&M operational status
Clerk of Works COW O&M				Construction completion certificate	Operation data from region O&M exp. by category O&M sys. data sheets Summary of O&M by project O&M job sheets O&M operational status
Water Quality Lab					Water Quality Reports Sanitary Surveys
WS&S Committee		Final Design Sign Memor of Understanding	Plan of action (develop) Material request and timing for latrine const WS&S Comm. constr. log	Constr. complet. certif	Operation data/pumping hrs - Diesel
Community	Preliminary Design				

5. The project manager with the assistance from staff should develop a plan for the year. The plan should be based upon GOS and donor inputs, community request and readiness, hydrological and geohydrological information, status of human resources, and level of transport support.

5.2 Water System Construction

5.2.1 Program Level

1. RWSB should review and supervise planning, design and construction of NGO and/or subcontracted projects by requiring them to follow the same procedures and standards used by the RWSB.

2. RWSB should carefully monitor the handpump program and develop a standardization of equipment at the earliest possible date. It should require standard pipe sizes, fittings, etc., in all macro-systems from all donors.

3. RWSB should develop standard design, construction, and operational procedures for surface water treatment systems which are appropriate to Swaziland conditions. Operational research needs to be initiated in this area as surface waters with high turbidities are the only sources for some communities.

5.2.2 Field Level

1. RWSB should initiate an implementation log for each water system under construction. The CDO, COW, or Planning Engineer for that project would be responsible for updating this on a monthly basis and for reporting the log to design, planning and public health engineering.

2. RWSB should monitor closely the requirement to have 60% of the materials for constructing a water supply system at the site prior to initiating any construction activity by the RWSB.

3. RWSB should monitor the community monthly expenditures to insure that proper cost accounting for project operation is maintained.

4. RWSB should train construction crew in basic water supply and sanitation health message to compliment and reinforce messages from HAs.

5. RWSB should require that an approved VIP latrine be constructed and used by the construction crews in each community. The WS&S committee should assist in siting the crew latrine.

5.3 Latrine Construction

5.3.1 Program Level

1. MOH should review their guidelines for constructing and operating pit latrines. The existing guidelines are not representative of the VIP process. Serious problems exist with existing plans which could result in minimal reduction in fly production to the environment.

2. MOH should embark on an operational research program to develop slabs which include concrete risers and have reduced but adequate rebars. Vent pipe alternative material needs to be developed in that 50% of the cost of each latrine is in the vent pipe.

3. MOH should develop training and fabrication material which incorporates the theory of the VIP latrine and results of their operational research study.

5.3.2 Field Level

1. HI/HAs working closely with the Water Supply and Sanitation Committees should develop workplans for latrine construction.

2. WS&S committees should be trained and supervised by the HI/HA to implement a latrine construction log for their community.

3. HI/HAs should order latrine construction materials for community latrines on a monthly basis and should determine storage sites for materials at the earliest possible date after the community has signed an agreement with RWSB.

4. HI/HA in coordination with the WS&S Committee should determine a location for material storage and assist in construction of an approved VIP latrine for the construction crew. The construction crew should properly use a VIP latrine while working in the community. These crews should be oriented in the theory of the operation to the extent that they can answer questions, concerning the VIP latrines, by community members.

5.4 Design of Water Systems

5.4.1 Program Level

1. RWSB should develop standard plans and equipment for use by NGO's in implementing rural water systems.

2. RWSB should analyze the present use of RWSB staff in the design process to insure that maximum feedback is generated without serious impeding the progress of the unit as a whole. Specifically, the manner in which field trips to communities are organized and implemented. Serious consideration should be given to reducing the numbers of headquarters staff RWSB going to the field at one time.

3. RWSB should implement a more detailed log of construction activity to be submitted by the various Clerk of Works to the headquarters RWSB staff.

5.4.2 Field Level

1. The RWSB design unit should brief the CDO's in basic technical constraints relating to design of specific community system. The CDO's should then be able to represent general technical issues of alternative designs, hopefully decreasing the need for the design engineers to go to the field. This has been identified as a critical factor in terms of optimizing the design engineers' effort.

2. The RWSB should design, construct, test, and evaluate alternative surface water treatment systems. A site close to Mbabane could be chosen to allow for each access for evaluation and testing. The test should include long-term operational factors and maintenance requirements.

3. Cost data for each type of system should be generated by Clerk of Works (CDO?) and analyzed by the Design Unit. A system which is presently operational will collect the basic cost data.

4. Annual summaries of construction cost data for various capacity and type of water system should be generated and used in project planning and project design.

5.5 Operations and Maintenance

5.5.1 Program Level

1. The decentralization of the maintenance unit should be implemented at the earliest possible date. Training of these crews under a decentralized system should begin at the earliest possible time. Training on the use of the monitoring reports and techniques of organizing the work could begin now.

2. The training of preventative maintenance crews and village water system caretakers should begin at the earliest possible date.

3. Training information should be developed by the Clerk of Works/Maintenance for community water system caretakers. This training material should include routine operation, preventive maintenance, record keeping, and emergency conditions.

4. The COW/Maintenance should put in place a system for reporting on a monthly basis the operation and maintenance status of all RWSB systems. This will include the continuation of the O&M expenditure record and O&M job sheets. A monthly report indicating the operating status of all projects by type of water system should be put in place.

5. An annual report should be prepared by the COW/Maintenance which indicates the operating status of all systems, O&M costs per system and status of community participation.

5.5.2 Field Level

1. As soon as decentralized maintenance centers are in place, a plan of action should be developed for monthly visits to each RWSB system within the regions. Priorities should be given to those which have demonstrated an ability to keep their systems operational. As systems are brought back in line by the maintenance teams, those systems would immediately be placed in their respective regional schedules.

2. The preventative maintenance team should work closely with the assistant CDO's, HI/HA and community Water Supply and Sanitation Committee to insure that the community is trained and supervised in community based water system management

3. The Water Supply and Sanitation Committee needs to be trained in equipment and fuel record keeping and community O&M fund management.

4. The O&M crews need to compliment the on-going HE effort by practicing good hygiene and sanitation while in the communities and by being able to respond to questions or concerns community members might have concerning safe use of water and good sanitation.

5.6 Performance Evaluation

5.6.1 Health Education

1. Based upon HI/HA monthly reports the HI/PHE should prepare an annual report which indicates the number of community members reached through RWSB health education. This report should also include a summary of the type of messages delivered by the HI/HA.

2. Based upon HI/HA monthly reports the HI/PHE should prepare an annual summary of HE constraints and needs as identified in each project area. A plan of action should be developed on how to resolve those reoccurring and common problems. This report should be directed to the Health Education Unit of the MOH for assistance and advice. Any evaluation of media, messages, and techniques should be contained in this report.

3. Extensive use of appropriate posters and pamphlets should be coordinated by the HI/PHE. This includes but is not limited to the following sites: schools, clinics, demonstration latrines, markets, pump houses, reservoirs, etc.

5.6.2 Latrines Constructed

1. Based upon the HI/HA's monthly reports the HI/PHE should prepare an annual report on latrines constructed and present homestead coverage for all new projects.

2. Based upon the HI/HA's monthly reports the HI/PHE should determine the factors which best relate to latrine construction and coverage to health education and community mobilization and community mobilization effort.

3. Based upon selective on-going water and latrine project communities a study should be designed, based upon homestead survey, to determine latrine use and coverage.

5.6.3 Water System Construction

1. Based upon O&M reports determine the quantity of water produced on a per capita basis for various types of water sources within the RWSB system.

2. Based upon COW and DE reports determine the system and per capita cost of projects finished in FY '87.

3. Based upon COW's and CDO's progress reports determine the relationship between system construction time and community participation. Evaluate the effect of having 60 percent of the project material on-site as with the level and timing of community contribution.

5.6.4 System Reliability

1. Based upon COW/Maintenance records determine the annual operating status of all RWSB systems. This status report will include existing situation and percent of time operating in the last year.

2. This report should include an assessment of those factors which effect the reliability of the various types of systems.

3. Based upon follow-up homestead surveys the number and frequency of homestead members requiring an alternative source of water, after a system is in place should be analyzed in reference to recommendation number 1.

4. Based upon follow-up homestead surveys the convenience of new system compared to the traditional sources of water prior to a project should be determined.

5.6.5 Quality Produced

1. Prepare an annual report which summarizes the water quality of the RWSB systems.

2. Analyze system water quality data in relationship to time of year and large scale meteorological changes.

5.7 Utilization

5.7.1 Water Storage Practices

1. Based upon preliminary homestead survey prepare an analysis of storage practices of water in the home for use by HI/HA, RHM, and CDO's in implementing health education and community mobilization programs.

2. Identify needs for home water storage health education materials. Prepare requests to the Health Education Unit to design and produce these materials.

5.7.2 Quantities of Water Used

1. Based upon preliminary homestead survey determine the amount of water used for different purposes from the various available sources.

2. Determine whether different system types (spring, surface, borehole, etc.) have different distributions of water uses as a function of sources, and alternatives available.

5.7.3 Utilization and Condition of Latrines

1. Based upon follow-up homestead survey determine the utilization of latrines within a community.

2. Based upon follow-up homestead survey determine the operating condition of latrines.

5.7.4 Readiness Assessment

1. Projects should be analyzed to determine how accurate the readiness survey was in predicting the readiness of a community to implement, accept, and maintain a water supply system.

Appendix A

PERSONS CONTACTED

APPENDIX A

Persons Interviewed

Name	Designation
Napoleon Ntezinde	Senior Engineer
Isaac Ngwena	Design Engineer
Leslie Mtetwa	Senior Health Inspector
Dr. A. W. Hoadley	Public Health Engineer RWSB/MOH
Madoda Dlamini	Public Health Engineer RWSB
Nicholas Ginindza	Senior CDO
Melvin Mayisela	Cadet Engineer
Emmanuel Lukhele	COW RWSB
Guy Mazibuko	COW Maintenance
Dudu Dube	H/Inspector RWSB/MOH
Wellington Nibbele	Statistic Clerk
Wilson Nkambale	H/Assistant MOH
Elphas Gama	H. Assistant MOH

Appendix B

FORMS

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Form 1

COMMUNITY READINESS ASSESSMENT

1. Name of community _____ Region _____

2. Has community been resettled? Y N
   If no, is community goining to be resettled? Y N
   When _____

3. Name of chief _____
   Name of Indvuna _____

4. Source of initial request _____

5. Content of request:
   No. of homesteads _____
   Estimated population _____
   Schools _____
   Clinic _____
   RDA _____
   Other _____

   Proposed source _____

6. Dates of follow-up requests

Dates	Concerns/Issues
_____	_____
_____	_____
_____	_____
_____	_____

7. Do you have a water and sanitation committee Y N

Name and positions of Water and Sanitation committee members if one exists:

NAME	POSITION

8. What are most important community needs in the area?

1. _____
2. _____
3. _____
4. _____

9. Can any of these needs be solved by a Water and Sanitation Project Y N

10. Is there a women's development around in the area? Y N

11. What are the most important needs for the Development of the Community?

1. _____
2. _____
3. _____
4. _____

12. Do you have a health committe around in the area? Y N

13. What are the most important health problems in the area?

1. _____
2. _____
3. _____
4. _____

14. Can any of the problems be solved by water and/or a sanitation project? Y N

15. What are the reasons for these problems in this area.

1. _____
2. _____
3. _____

16. Would any of the reasons listed above be satisfied by implementation of a RWSB, WS & S project? Y N

17. Has the community been involved in development projects in the past? If yes, what type of projects

TYPE	SUCCESS	COMMUNITY INPUT

18. Are there active development projects going on now Y N

Type _____ When completed _____

19. Are any of the past projest still operating? Y N

Type _____

20. Did any of these on-going or past project require community input? Y N

Type of input _____

21. If labor contributed what time of year was it contributed?
Type _____ Year _____

22. Was community happy with the project(s) Y N
Type(s) _____

23. Has there ever been a water project in this community? Y N
°Type of project _____

24. Are there other water/sanitation projects in neighbouring community Y N
Where? _____

25. Has the community arranged means to assist government in this project investment? Y N
Describe _____
_____
_____

26. What other development projects does the community plan to initiate and when will the project start (If still pending)? _____
_____
_____
_____

27. Is one of the on-going projects a latrine project? Y N

28. Does your chief indicate a willingness to support project? Y N

29. Does your chief indicate an understanding of the RWSB process/procedure? Y N

30. Will this project cover only one chiefdom? Y N

31. Is there only one chief/leader with authority in the project area? Y N

32. Conflicts are not apparent which could affect the success of this potential project Y N

33. Does the community feel like their present water supply meets their needs? Y N

34. Overall assessment of community readiness:

HIGH _____ MEDIUM _____ LOW _____

Reasons: _____

_____

_____

_____

_____

35. If community is not ready what does the community need to do to demonstrate that are ready: _____

_____

_____

_____

PERSON COMPLETING FORM _____

POSITION _____

DATE _____

Form 2

HEALTH INSPECTORATE

MINITRY OF HEALTH

HOMESTEAD SURVEY FORM

1. Survey: Community: _____

   Prelimary Region: _____

   Completion RU No.: _____

2. Head of Homestead: _____

   Date visited: _____

   Person interviewed: Head of household _____

   Wife: _____

   Other: _____

3. Highest level of education attained by any member of the homestead:

   _____

4. No. or persons living in homestead:

   No. of Babies _____

   No. of Children under 13 _____

   No. of Older Children _____

   No. of Adults _____

5. What do you feel are the most important needs in your community?

   (In order of importance)

   1. _____ 2. _____

   3. _____ 4. _____

6. Are members of this homestead often sick? Y N

   What illnesses are most common?

   1. _____ 4. _____

   2. _____ 5. _____

   3. _____ 6. _____

7. Are there ways you know to prevent and treat these diseases?

   _____

   _____

   _____

8. In the past what information have you received from the following sources:

Radio: _____

Clinic: _____

RHMs: _____

HI/HA _____

CDO/RWSB: _____

CDO/Tinkhundla: _____

HED Materials: _____

Other: _____

9. Is this homestead served by: Y N

10. Time of travel to the nearest clinic: _____

11. Have there been or are there other projects to meet needs in this community? Y N

12. Did you participate? Y N

How_____

_____

_____

13. Were you happy with the project? Y N

Why: _____

_____

_____

14. Water Supply

	Source	Where do use it	Do you have where do problems the this source of water
1. Drinking			
Cooking			
Washing hands			
Washing dishes			
2. Bathing -			
Adults			
children			
3. Washing Clothes			
4. Gardening			
5. Livestock			
6. Other			

15. Are there times when you use alternative sources? Y N

Describe: _____

_____

_____

_____

16. What is the time of travel to your usual water sources?

Source	Time of Travel (Minutes)	No. of trips per day

17. Have you or other members of this homestead participated in community meetings about the water supply? Y N

18. If yes, was GOS present? Y N

19. Where is water storage container placed ? _____

20. How is the water removed from storage contained? _____

_____

21. If an inkombosi is used, where is it stored? _____

SANITATION

22. Do you have a latrine? Y N

23. If no, is there a reason you do not have or use a latrine? _____

_____

_____

If yes:

Type of pit: Single _____

Separate for male and female _____

Slab material: Local

Concrete Vent Pipe: Y N

Year completed: _____

24. Why constructed: _____

Did you have any assistance? Y N

From whom _____

25. Are you happy with your latrines? Y N

26. Who uses latrine(s)?

	Male	Females
Adults	____	_____
Children	____	_____
Total	____	_____

27. Have you or members of your homestead discussed sanitation in community metings? Y N

28. Do you think the water supply will be good for the community?

Y N

Why? _____

_____

_____

29. Do you think the water supply will be good for your homestead?

Y N No opinion

Why? _____

_____

_____

30. If you have a new water system, for what purposes do you expect to use the water? _____

_____

_____

31. What can the people of this community contribute to make this project a success?

Contribute Labour	Y	N
Contribute Funds	Y	N
Contribute Materials	Y	N
Provide Equipment	Y	N
Other	_____	

32. How much water is collected for use at this homestead?

Container Size	Type	No of Containers Collected per day

33. How is water stored in this homestread?

Type of container	Is container OPEN	COVERED	Size (litres)	Number
plastic				
clay				
metal				
Other				

34. Has any one talked to you about sanitation?

Y N Who _____

35. Do you think latrines will benefit the community?

Y N Why? _____

36. Would you like to construct a latrine at your homestead?

Y N Why? _____

37. Do you need help to construct a latrine?

Y N

If yes, what kind of help is necessary? _____

38. If a latrine currently exist what is the cndition of the latrine for the following categories,

	GOOD	BAD	COMMENTS
Structure	____	____	_____
Pit condition	____	____	_____
Cleanliness	____	____	_____
Entrance	____	____	_____
Vent Pipe	____	____	_____

Form 3

COMMUNITY PROFILE

1. Community Name: _____

   RU Number: _____

2. Total number of homesteads in project _____
3. Total number of people served by project _____
4. Average highest education level of community _____

5. Community needs - Order of importance with score

   1. _____ 3. _____

   2. _____ 4. _____

6. Major sicknesses experienced by community members.

   1. _____ 4. _____

   2. _____ 5. _____

   3. _____ 6. _____

7. Sources of information (% of community)

	Radio	Clinc Nurses	RHM	HI/HA	CDD/RWSB	CDR/TIN	OTHER
Water Supply							
Sanitation							
Health							
Food Production							
Nutrition							
Other							

8. Homestead participating in other community projects: total _____ % _____
9. Homesteads satisfied with previous projects: total _____ % _____
10. Major problems encountered in previous projects:
    1. _____
    2. _____
    3. _____
    4. _____
11. Homesteads satisfied with present water sources: total _____ % _____

12. Homesteads using alternative water sources: during the rainy season: total _____ % _____
at times of draught: total _____ % _____

13. Average travel time to drinking water source used by for all homesteads _____ % _____

14. Maximum travel time to drinking water source for any homestead _____ % _____

15. Homesteads which have participated in community meetings about water supply: total _____ % _____

16. Homestead reporting these meetings in which GOS was present: total _____ % _____

17. Homesteads which think that a new water supply system will be good for the community: total _____ % _____

18. Homesteads who think that a new water supply will be good their homestead: total _____ % _____

19. Present source of water used: total _____ % _____

	Sources	Where do you use it	Do you have problems with it
Drinking, cooking washing hands, washing dishes			
Washing Clothes			
Bathing			
Gardening			
Livestock			

Are there times when people use an alternative source Number _____ % _____

Describe _____

_____

_____

20. Expected uses of a new water system

_____

_____

_____

21. Homesteads willing to contribute to a new water supply

	Number	Precent
Labour	_____	_____
Funds	_____	_____
Materials	_____	_____
Equipment	_____	_____
Other	_____	_____

22. Average per capita water consumption _____ l/c/d.

23. How water is stored at homesteads

Type of Container	Container: Open No.	Container: Open %	Container: Covered No.	Container: Covered %	Size (Litres)	Number
Plastic						
Clay						
Metal						
Other						

24. Placement of water storage container in home.

Type	Number	Percentage
Inside floor	_____	_____
Outside ground	_____	_____
Inside table	_____	_____
Outside table	_____	_____
Other	_____	_____

25. Types of devices to remove water from home storage container

Type	Number	Percentage

26. Place inkombosi is stored in home

Where Stored	Number	Percentage

27. Homesteads with latrines: Number _____ % _____

28. Homesteads without latrines: Number _____ % _____

Reason: 1. _____ 4. _____

2. _____ 5. _____

3. _____ 6. _____

29.. Single pit: Number _____ % _____

Double pit: Number _____ % _____

30. Slab made of local materials: Number _____ % _____

31. Latrines with vent pipes: Number _____ % _____

32. Year completed

Year	Number	Percent of total

33. Reason for constructing latrine

1. _____
2. _____
3. _____
4. _____

34. Latrines that had assistance in construction

Number _____ % _____

35. Happy with their latrine ? Yes _____ % _____

No _____ % _____

People using latrines

	Male	Female	Total	Percentage
Adult				
children				
Total				
Percentage				

36. Homestead members who have discussed sanitation at a community meeting: Number _____ % _____

37. Homesteads who have talked about sanitation: Number _____ % _____

38. Homesteads who would like to construct a latrine: Number _____ % _____

39. Homesteads who need help in constructing a latrine: Number _____ % _____

40. Types of assistance needed to constructing a latrine

Type of assistance	Number	Percentage
Siting		
Construction		
Equipment		
Materials		
Usage		

FORM 4

CDO VISIT REPORT

Community_____ Project Number_____

Name of CDO_____ Date of Visit_____

Community Contact_____

Purpose:

Persons Contacted

Problems/Constraints

Status

Suggestions

FORM 5
CDO MONTHLY REPORT

Name of CDO_____ Month_____

Summary of Activities

Community	Contact	No. of Visits	Problems	Status	Recom.

Amount of Time Spent in Community

_____ 10% _____ 25% _____ 50%_____ 75%_____ 90%

Assessment of Progress To-Date in Each Community

Priority Communities

Requests for Technical Assistance

FORM 6

SIGNED AGREEMENT

The community of_____enters into an agreement with the Rural Water Supply Board to assist in the implementation of a _____ ___water supply system and in the construction of_____ _____latrines. The community will agree to form a Water Supply and Sanitation Committee and to supply ___hours of community labor starting_____through the completion of the project_____. The community will also provide_____man days of food and housing for the period. The community will also supply_____yd^3 of sand/gravel and_____.

The RWSB will provide technical assistance in th eplanning, design, construction, and maintenance of the system. The RWSB will provide materials necessary for the construction of the system.

The community will agree to operate the water system and to maintain the system within their limitations. A fund will be developed and implemented by the WS&S Committee to collect user fees to pay for fuel, lubricants, and operator's salaries.

_____	_____
Community Leader	RWSB - CDO
_____	_____
WS&S Committee Chairman	MOH - HI/HA

Form 7

HEALTH ASSISTANT VISIT REPORT

PROJECT NAME: _____ PROJECT NUMBER: _____

NAME OF H.A.: _____ DATE OF VISIT : _____

PURPOSE (SPECIFIC)

PERSONS CONTACTED

ACTIVITIES - DATES

_____ What community can do
_____ Where can they go for help
_____ Disease transmission
_____ How to request WS; SN; Health
_____ Responsibilities of community
_____ Operational
_____ Maintenance
_____ Linkage
_____ Implementation of WS
_____ Water & Sanitation Committee
_____ Material storage
_____ Community participation

_____ Water storage/use
_____ Latrine construction
_____ Water wash disease
_____ Food hygiene
_____ ORT
_____ Breast feeding
_____ Immunization
_____ Malaria
_____ Solid waste
_____ Latrine use
_____ Other

ASSESS OUTCOME:

CONSTRAINTS:

FOLLOW-UP SUGGESTION:

IMMEDIATE ACTION NEEDED:

Form 8

MONTHLY ACTIVITY REPORT

(report only activities during reporting period)

COMMUNITY: _____

RU NO. : _____

REPORTING PERIOD: _____

Workplan submitted to Clerk of Works

CONTACTS WITH RWSB:

PERSONS CONTACTED	DATE	PURPOSE/ACTIVITY

CONTACTS WITH COMMUNITY:

LATRINE CONSTRUCTION/UTILIZATION:

		WORK TO DATE	
	THIS PERIOD	TOTAL DONE	TARGET
No. of latrines cited			
No. of pits started			
No. of pits completed			
No. of slabs constructed			
No. of slabs at homestead			
No. of superstructures started			
No. of superstructures completed			
No. of latrines in use			

INVENTORY	CEMENT	REINFORCEMENT	VENT PIPES
1. On hand end of last report	_____	_____	_____
2. Received this month	_____	_____	_____
3. SUBTOTAL (1 + 2)	_____	_____	_____
4. Used this month	_____	_____	_____
5. New on hand (3 - 4)	_____	_____	_____
6. Required next month	_____	_____	_____
7. Requested (6 - 5)	_____	_____	_____

REMARKS/CONSTRAINTS

HEALTH ASSISTANT _____

DATE: _____

Form 9

LATRINE CONSTRUCTION WORKPLAN

MONTH		PAYMENT	SITING	TARGET DATES					
				PIT		SLAB		STRUCTURE	
				START	FINISH	START	FINISH	START	FINISH

Form 10 ·

LATRINE CONSTRUCTION WORKPLAN

TARGET DA1__

OMESTEAD UMBER	HEAD OF HOUSEHOLD	PAYMENT	SITING	PIT		SLAB		STRUCTURE	
				START	FINISH	START	FINISH	START	FINISH

Form 11

COMMUNITY _____

RU NO. _____

CDO _____

HA _____

WATER AND SANITATION COMMITTEE'S

LATRINE CONSTRUCTION PROGRESS REPORT

RECORD DATE

HOMESTED		Site Measured	PIT		SLAB		STRUCTURE		Remarks
Number	Head		Start	End	Start	End	Start	End	

Form 12

DESIGN/SPECIFICATIONS/MATERIAL LIST

Community_____ Project #_____

Date Design Initiated_____ Completed_____

Design Team_____ Total Man Hours Design_____

Existing Population_____ Design Period_____

Growth Assumption %_____ Per Capita Demand_____

Design Population_____ Other Demands_____

Number of Reservoirs_____ Number Trips To Site_____

Number of Households_____

Number of Standpipes_____

Source of Water_____ Well Depth_____

Distance from Community_____ Well Yield_____

Well Drilled (Date)_____ Surface Water (Low Flow Q)_____

	Spring	Reservoir	Well	Standpipes	Cost
Amount of Concrete					
Amount of Sand					
Amount of Gravel					
Amount of Rock					
Amount of Rebar					

Pipe	Size	Total Length	Cost

Total Cost_____

Fittings_____ Cost_____

Pump Size_____ Capacity_____ Cost_____

Generator Size_____ Capacity_____ Cost_____

Other Cost_____

TOTAL COST_____

FORM 13

MONTHLY CONSTRUCTION PROGRESS REPORT

COMMUNITY _____

RU NO. _____

MONTH _____

ACTIVITY	MONTH																		% Compl	REMARKS
I. Mobilization RWSB Manpower 60% Material on site																				
II. Source Source development Control house Fences, ditches etc Subcontracts																				
III. Transmission Trenching Laying Pipe & Bedding Back filling																				
IV. Treatment Site Works Pour footings & floor slaps Erect walls and plastering Filter material Chlorination																				
V. Reservoir Site Works Pour footings & Floor Slabs Erect Walls and Plastering Pour Roof Slab Fences, ditches, Indicators Subcontracts																				
VI. Distribution Trenching Laying Pipe and Bedding Barkfilling Pipeline Markers (incl. Transmission) Break Pressure Tank																				
VII. Standpost Erection Soakaway Construction																				

Form 14

SUMMARY OF LABOUR COSTS

MONTH: _____

NAME OF SYSTEM: _____

NAME	CLASSIFICATION*	DAILY WAGE*	N° OF DAYS ON SYSTEM	TOTAL WAGES CHARGED TO SYSTEM
			TOTAL:	

*From Personnel List

SUMMARY OF TRANSPORTATION COSTS

	CATEGORY	KM DRIVEN		COST/KM		TRANSPORTATION COST
(a)	Heavy duty vehicles	_____	x	E0.80	=	_____
(b)	Medium duty vehicles	_____	x	E0.60	=	_____
(c)	Light duty vehicles	_____	x	E0.40	=	_____
				TOTAL:	=	_____

FORM 16

MONTHLY EXPENDITURE STATEMENT
DONOR FUNDED WATER SUPPLIES

MONTH: _____

NAME OF SYSTEM: _____

	Donor			GOS
	Materials	Transport	Total	Labour
1. Amount Budgetted				
2. Amount Available at Start of Month				
3. Expenditures During Month				
4. Balance Remaining at End of Month (line 2 less line 3)				

*See Appendix A

**See Appendix B

Form 17

TOTAL COST DATA FOR COMPLETED PROJECTS

RWSB # _____ COMMUNITY _____

PROJECT INITIATED (DATE) _____ CONSTRUCTION FINISHED (DATE) _____

COMMUNITY POPULATION _____ DESIGN POPULATION _____

TYPE OF PROJECT _____

DONOR _____

SOURCE OF FUNDS/CONTRIBUTIONS

	RWSB	MOH	DONOR	COMM	TOTAL
ADMINISTRATION					
PLAN AND DESIGN					
CONSTRUCTION					
HEALTH EDUCATION					
COMMUNITY PARTICIPATION					
COST RECOVERY					
TOTAL					
O&M PREVENTIVE					
ON-GOING OPERATIONS					
MAINTENANCE					
TOTAL					

CONSTRUCTION COST

GOS COST/CAPITA _____

COMMUNITY COST/CAPITA _____

DONOR COST/CAPITA _____

TOTAL COST/CAPITA _____

TOTAL COST/SYSTEM _____

O&M

ANNUAL GOS O&M COST/CAPITA _____

ANNUAL COMMUNITY O&M/CAPITA _____

ANNUAL DONOR COST/CAPITA _____

ANNUAL TOTAL COST/CAPITA _____

ANNUAL TOTAL/SYSTEM _____

Form 18

OPERATIONAL COST/COMMUNITY LOG BOOK

Community_____ RWSB #_____ Month(s)_____

Chairman WS&S Committee_____Operator_____

Week	Dates	Water Gallons	Fuel Gallons	Cost	Electricity KWH	Cost	Lubricants	Manpower
1								
2								
3								
4								
5								
TOTAL								

Total Days Operational_

Operational Maintenance Problems

Technical Assistance Needs

WS&S Committee Recommendations

_____ Signature WS&S Committee Chairman

_____ Operator Signature

Form 19

RURAL WATER SUPPLY BOARD

Operation and Maintenance Status

MONTH: _____

Location System	Type of project	RU No.	Type of system	Meter reading	Pumping hours	Hours down	Status Remarks

Form 20

O & M JOB SHEET

Community_____ RWSB #_____

Operator_____ Date of Request/Finding_____

Emergency_____ Non-Emergency_____

Maintenance Request/Finding

Maintenance Team's Diagnostic

Materials Required

Type of Material/Part	Availability	Cost

Manpower Required _____ Total Man-Hours _____ Cost _____

Travel Time _____

On-Site Time _____

Maintenance Completed - Date_____ System Operational_____

Follow-up Recommendations

Form 21

O & M SYSTEM
DATA SHEET

Beginning Date_____ Final Date_____

Total Days_____

Type of System	Operating Status	A Fuel Cost	B Operator Cost	C Part Cost	D Maint Manpower Cost	Subtotals AB	Subtotals CD	Total
A. Gravity Comm. & #								
1.								
2.								
3.								
4.								
5.								
B. Surface Water								
1.								
2.								
3.								
C. Borehole Centrifugal Pump								
1.								
2.								
3.								
4.								
D. Borehole Hard Pump								
1.								
2.								
3.								
4.								
E. Other								
1.								
2.								
3.								
4.								

Form 22

RURAL WATER SUPPLY BOARD

Maintenance Cost

MONTH: _____

Project Name	Number	Inspections	Pipeline/ Standpipe	Equipment Controls	Major Repairs	Total

Form 23

O & M EXPENDITURES BY CATEGORIES

A Summary of O & M Expenditures for all RWWSB Projects

Fuels	Community	RWSB Donor	Cost
Lubricants			
Electricity			
Generator Parts			
Pump Parts			
Pipes			
Fixtures			
Other			

Form 24

RURAL WATER SUPPLY BOARD

Operational Status

MONTH: _____

Types of Systems	No.of systems	No. operating	No. not operating equipment	No.not operating fuel	No.not operating	Remarks

Form 25

YEAR _____

ANNUAL SUMMARY OF
OPERATIONAL STATUS AND
MAINTENANCE COST

DATE _____

PERSON _____

LOCATION OF SYSTEM	FU NO.	TYPE	ANNUAL WATER USAGE	PERCENT OF TIME OPERATIONAL	FUEL KWH USED	MAINT. COST	PRVENT COST	REMARKS

Form 26

SANITARY SURVEY

SURVEY OF

_____

ON

_____

1. GENERAL INFORMATION

1.1. Survey of _____
on _____
by _____

1.2. Attach copy of master sheet
Any changes required on master sheet:

2. BACKGROUND INFORMATION

(To be obtained prior to field inspection)

2.1. OPERATOR
Name: _____
Location: _____

2.2. WATER COMMITTEE
Name of Contact: _____
Location: _____

2.3. MAINTENANCE
Maintenance done by: _____
Problems, frequency: _____
_____
_____
_____
Preventative maintenance: _____
_____
Recommended remedial actions: _____
_____

2.4. WATER QUALITY

Attach previous 2 year data - compare to current data

Data summary:_____

Comparisons:_____

Problems - Excursions to guidelines:_____

3. FIELD OBSERVATIONS - SYSTEM

3.1. SOURCE

Comments on:

i) Proximity to sources of contamination;

ii) Protection from surface water contamination/erosion;

iii) Pumping system protection;

iv) O&M problems;

v) Potential for future problems

3.2. Pumping Main or Pipeline from Source to Storage

Comment on: i) erosion; ii) leaks; iii) structural problems; iv) operations; v) presence of stand pipes:_____

_____

_____

_____

_____

_____

_____

_____

_____

3.3. STORAGE

Comments on:

i) protection from surface water, erosion, animals;

ii) overflows; access, inlet, ballvalve; iii) water clarity; iv) slimes, sediment, insects, etc.; v) fence; vi) leaks

_____

_____

_____

_____

_____

3.4. TREATMENT

Comments on:

i) type, design, construction, structural integrity,

ii) operations, maintenance

iii) protection from surface water, erosion, animals

iv) effectiveness, control; v) access, fence; vi) potential for contamination;

vii) need for cleaning, repairs, etc.

_____

_____

_____

_____

_____

3.5. RETICULATION/DISTRIBUTION

Comments on:

i) pipelines - leaks, airlocks, pressures; ii) pressure release tanks - protection, access, operations; iii) standpipes - leaks, pressure, soakaways, drainage, contamination portential; iv) potential for cross-connections, erosion, contamination of system.

_____

_____

_____

_____

_____

4. OPERATIONS/MAINTENANCE/INTERVIEWS

4.1. OPERATOR

Name:_____

Training:_____

Paid by:_____

Problems:_____

_____

Testing, Records:_____

Complaints:_____

_____

Comments:

4.2. WATER COMMITTEE

Interviewed:_____

Committee's functions:_____

_____

Problems, complaints:_____

_____

_____

Comments:

4.3. USERS/COMMUNITY

Interviewed:_____

Problems, Complaints:_____

_____

_____

5. WATER QUALITY

5.1. System data - compare raw, treated, and point-of-use water and provide comments:

_____

_____

_____

_____

5.2. Compare previous data to current data:_____

_____

_____

5.3. Problems and potential causes:_____

_____

_____

_____

6. RECOMMENDATIONS

6.1. Suggested remedial actions to rectify problems.
Categorize according to severity of problems and urgency of remedial action.

PROBLEM	ACTION REQUIRED	PRIORIZATION

6.2. ACTION TAKEN

Notification to:_____

on:_____

Discussed with:_____

on:_____

Remedial Action to be completed by-whom:_____

when:_____

7. FURTHER COMMENTS

_____

_____

_____

_____

_____

_____

Date:_____ _____

Signature

Form 27

WATER SUPPLY, SANITATION, AND HEALTH EDUCATION
PROJECT IMPLEMENTATION LOG

MUNITY _____

NO. _____

DATE		COMMENTS
_____	REQUEST	_____
_____	READINESS SURVEY	_____
_____	COMMUNITY PROFILE	_____
_____	PRELIMINARY DESIGN	_____
_____	COMMUNITY MOBILIZED	_____
_____	FINAL DESIGN	_____
_____	O+M FUND ESTABLISHED	_____
_____	AGREEMENT SIGNED	_____
_____	LATRINE PLAN OF ACTION	_____
_____	LATRINE MATERIALS ON-SITE	_____
_____	LOCAL ARTISANS TRAINED	_____
_____	LATRINES SITED	_____
_____	LATRINE CONSTRUCTED INITIATED	_____
_____	WATER SYSTEM PLAN OF ACTION	_____
_____	_____ % OF LATRINES CONSTRUCTED	_____
_____	HEALTH EDUCATION MODULE COMPLETED	_____
_____	60% OF WATER SYSTEM MATERIALS ON-SITE	_____
_____	WATER SYSTEM STARTED	_____
_____	O+M PLAN OF ACTION	_____
_____	WATER SYSTEM FINISHED	_____
_____	ALL LATRINES CONSTRUCTED	_____
_____	WATER STORAGE AND USE CERTIFIED	_____
_____	SYSTEM CERTIFIED	_____
_____	SYSTEM DEDICATED	_____
_____	AS-BUILT PLANS COMPLETED	_____
_____	WATER QUALITY CHECK	_____

Form 28

FY _____

MONTH _____

PROGRAM STATUS REPORT

FORM

	FY TOTAL TO DATE	THIS MONTH	
nber of communities requesting systems	_____	_____	
nber of communities ready for WS & S project	_____	_____	
nber of communities with signed agreements	_____	_____	
nber of communities active in design section	_____	_____	
nber of communities active in latrine construction	_____	_____	
nber of communities with 60% materials on-site	_____	_____	
nber of communities furnished WS this FY	_____	_____	
nber of communities furnished Sanitation this FY	_____	_____	
pulation served water this FY	_____	_____	
pulation served santitation this FY	_____	_____	
tal communities in RWSB program	_____	_____	
nber of systems operating	_____	_____	____ %
nber of systems not operating	_____	_____	____ %
Number not operating/technicals	_____	_____	____ %
Number not operational/community	_____	_____	____ %
Number not operational/rehabilitation	_____	_____	____ %
nber of communities with WQ problems	_____	_____	
nber of communities with community problems	_____	_____	
nber of communities serviced by Maintenance crew	_____	_____	
nber of communities serviced by Preventative Maintainance crew	_____	_____	

Form 29

SAMPLE SHEET

RURAL WATER SUPPLY BOARD
WATER QUALITY SECTION
P/B 9, KWALUSENI

TURN OVER FOR SAMPLING PROCEDURE

PLEASE PRINT:

SYSTEM LOCATION: .....
SOURCE: .....
DISTRICT: .....
POPULATION SERVED: .....
RESERVOIR SIZE: .....

SAMPLER'S NAME AND ADDRESS
.....
.....
DATE SAMPLED: .....
DATE RECEIVED: .....

SAMPLE NO.	LAB NO.	DESCRIPTION	CHLORINATED	
			YES	NO

Please indicate tests required:
RESULTS: For office use only.

LAB NO	COLIFORMS		TURB (FTU)	COL.	COND MHOS/CM	m.g/L								
	TOTAL	FAECAL				CHLORINE TOT	CHLORINE FREE	pH	HARD	TDS	Cl	NO_3		

RECOMMENDATIONS:

SAMPLING PROCEDURES

BACTERIOLOGICAL	CHEMICAL/PHYSICAL
1. Obtain sterile sample bottle(s) from RWSB, Water Quality Section (WQS). (Phone - 84155)	1. Obtain chemical sample bottles from RWSB, WQS. (Phone 84155)
2. Wash and dry hands before sampling.	2. Wash and dry hands before sampling.
3. Run water to waste for two (2) minutes by the clock.	3. Remove cap and **RINSE SAMPLE BOTTLE** with water to be sampled
4. Remove cap (careful not to touch lip of bottle or inside of cap) and fill to above the 200ml mark. **DO NOT RINSE BOTTLE.**	4. Fill bottle to 500ml or 1000ml mark.
5. Replace cap and transport on ice to the WQS within 24 hours.	5. Transport to the WQS as soon as possible.
6. Samples must be brought in before 10:00 a.m. on Thursday of each week.	
7. Samples should be taken at the source and distribution system.	

TEST RESULTS

BACTERIOLOGICAL	CHEMICAL/PHYSICAL
TOTAL COLIFORMS/100ml: The presence of total coliforms indicates the possible presence of pathogenic (disease causing) bacteria.	**Turb-TURBIDITY:** Levels>25FTU may cause gastro-intestinal irritation. **CHLORINE:** (Free) - should be between 0.2 - 0.5mg/L. **CL-CHLORIDE:** Levels>250mg/L will give a salty taste.
FAECAL COLIFORMS/100ml: The presence of faecal coliforms indicates faecal contamination and poses a potential health hazard.	• **NO_3-N-NITRATE** as Nitrogen: Levels above 10mg/L may cause a blue baby condition in infants. Infants should not drink water with NO_3-N>10mg/L. **Hard-HARDNESS;** Levels>500 mg/L may cause scaling. **pH:** Levels should be between 6.5 and 8.5

• CONSULT THE PUBLIC HEALTH ENGINEER, RWSB. - (PHONE 23231 or 23232)