Control of Water Borne Diseases in Swaziland

Final Report of Progress Under The Rural Water Borne Disease Control Project 1981–1986

Authorized under
Contract No.AID/afr-0087–C–00–1005–00

The Ministry of Health
P.O. Box 5
Mbabane

and

The Academy for Educational Development
1255 Twenty Third Street, N.W.
Washington, D.C. 20037
September, 1986

SP&P 094/2G

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UNITED STATES GOVERNMENT

memorandum

DATE: 12 February 1987

REPLY TO ATTN OF: Alan C. Foose, RHPDO

SUBJECT: Final Report: Rural Water-Borne Disease Control Project 1981-1986

TO: Dr. A.W. Hoadley, Chief of Party, Rural Water-Borne Disease Control Project (645-0087)

REF: Principal Secretary/MOH-Hoadley memo dated 2 December 1986
Senior Engineer/RWSB-Hoadley memo dated 1 December 1986

USAID has reviewed and hereby accepts your report of the Rural Water-Borne Disease Control Project's activities from 1981-1986. As can be seen from the two referenced memoranda, the Government of Swaziland has also accepted the report. USAID expects to review your recommendations with relevant GOS officials in March 1987.

We commend your efforts in presenting an exceptionally thorough review of the Project from the time of its inception through September 1986.

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PREFACE

This is a report of progress in building the capacity to control water-related diseases in Swaziland through improved water supplies, sanitation, and related health practices. It is a report of the contributions of several Ministries and units of government and of accomplishments which have been the result of their joint efforts over a period spanning nearly six years.

During this time, much progress has been made in building an institutional base for effectively implementing programmes for the control of water-related diseases, both within individual units and sector wide. At the same time, outputs have increased, established targets have been met, and a clear and practical programme for achieving national health goals has been established. This is not to suggest that ultimate goals have been met, nor that constraints do not remain. But progress has been gratifying, the capacity for continued progress is well established, and a plan exists for its achievement.

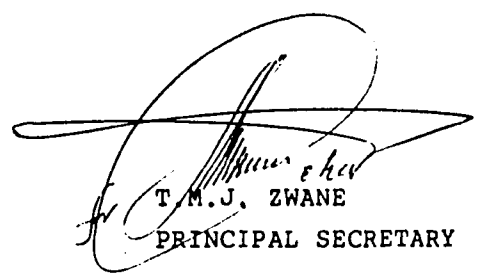
The past six years of achievement in building of institutional capacity and delivering services has received essential support from external sources contributing to related projects. A particular focus on water-borne diseases has been provided by a Rural Water Borne Disease Control Project implemented under the Ministry of Health with participation of other Ministries. Contributions of the Ministry of Works, Power and Communications and subsequently the Ministry of Natural Resources, as well as of other Ministries, have been essential to bringing this phase of sectoral development to a successful conclusion.

Essential to successful implementation of the Rural Water Borne Disease Control Project has been support received under an agreement between the Swaziland Government and U.S.AID. This

support was provided from early 1981 through September of 1986. This report is therefore a report of progress under the project agreement.

Special thanks are due to the Academy for Educational Development, their subcontractors, the American Public Health Association, and the technical experts whom they provided, who have worked with their counterparts in the Swaziland Government meeting and exceeding expectations of the project.

Continued achievement will depend upon continued support of sectoral development on the part of both Ministries and funding agencies working within the framework of the sectoral development plan which has been established.



T.M.J. ZWANE
PRINCIPAL SECRETARY

EXECUTIVE SUMMARY

Mortality rates particularly among children in Swaziland, are higher than would be anticipated based upon per capita gross national product. The primary causes of death among young children are the complex group of chilhood diarrheas, infectious diseases, pneumonia, and malnutrition, which is itself believed to be associated with a high incidence of diarrhea, infectious diseases, and poor sanitary conditions. National Health Policy and the Fourth Five Year Development Plan, recognizing the importance of these diseases, emphasize prevention, placing priority on provision of health education, promotion of clean water supplies and basic sanitation, and the prevention and control of endemic diseases. Key priorities are programs which focus on environmental and life style interventions.

To address the problem of diarrheas and other water and sanitation related diseases, the Ministry of Health signed an agreement with U.S.AID in 1979 by which U.S.AID agreed to provide funding for a Rural Water Borne Disease Control Project. Implementation began with the arrival of the first technical advisor in February, 1981. Funding from U.S.AID was extended until the end of September, 1986.

While the ultimate goal of the project was to improve the health status of the rural population, its objective was to provide a focus for Ministry of Health programs on that group of diseases which were among the most important causes of morbidity and mortality, and on the most vulnerable target population. Thus, the specific goal of the project was the reduction of diarrheal and other diseases related to water and sanitation among the rural population. To achieve this end, the project aimed at improving use and control of water and improving sanitary practices of the rural population. Since institutional capacity to implement programs for the control of these diseases turned out to be a serious constraint to achieving this goal, major emphasis was placed on expansion of the institutional

capacity to delivery effective preventive health services. This was done through construction and equipping of facilities, provision of technical assistance and training to strengthen technical capacity and management, building of a public health engineering unit, and undertaking specific studies to provide information required to plan and implement preventive programs.

The project provided support in five areas of program development:

Public Health Engineering: to establish and staff a public Health Engineering Unit, develop guidelines, and assure that health criteria were incorporated into water supply and other water resource development projects.

Sanitation: to standardize designs for latrine construction, meet implementation targets for latrine construction, and provide training.

Health Education: to staff a Health Education Centre, provide training, develop a national health education strategy and plan, implement a mass media campaign, and develop effective health education materials.

Social Sciences: closely linked to Health Education, to implement a survey of knowledge, attitudes, and practices related to water, sanitation, and health, assist in the development of health education materials training and other programs incorporating traditional values and perceptions assist in implementing other surveys and evaluations, including community organization, beliefs and practices relating to diarrheal diseases, and traditional healers as health care providers.

Epidemiology: to implement national schistosomiasis and parasitic diseases surveys, to provide training, and to develop control strategies.

The project was able to contribute to and facilitate attainment of specific goals related to each of the project elements. More importantly, however, it provided a common focus on water and sanitation related diseases within the Ministry of Health, the Rural Water Supply Board, and other related units of government. The success of the project was also in large measure a result of its flexibility and responsiveness to emerging needs. And in the last analysis, while building strength in each of the implementing and supporting units, it was able to contribute significantly to initiating coordinated development within the water and sanitation sector aimed at meeting health goals, building an institutional base for sectoral planning, drafting national policies and strategies to guide sectoral development, and drafting a national two year plan for development of the water supply and sanitation sector. These, like sectoral development itself, are not activities which can be implemented by any one Ministry or unit of government. A final major adaptation of the project was the provision of support of the construction of eight water supplies linked to latrine construction and health education. While not achieving the level of coordination desired, this activity did demonstrate clearly the ability of the Rural Water Supply Board to implement projects and ways in which coordination could take place. It was an important step in moving towards effective linkage of water supply, sanitation, and health education.

CHAPTER I. OVERVIEW OF PROJECT

1.1 Background

1.1.1 Status of Health in Swaziland

Swaziland National Health Policy, which defines priorities within the Ministry of Health, is appropriately determined by the major health problems of the country, which include high rates of infant, child, and maternal mortality and high incidence rates of communicable diseases. Prominent among the causes of high morbidity and mortality are diseases related to water and sanitation.

Health status in Swaziland is reflected in an infant mortality rate thought to be about 105 per 1,000 live births and an under five mortality rate calculated to be approximately 22%. Life expectancy at birth is between 44 and 48 years. The primary causes of death among young children in Swaziland are the complex group of childhood diarrheas, infectious diseases, pneumonia, and malnutrition. The prevalence of these and other environmental diseases reflects in large measure the dispersed character of settlement patterns which results in poor access to protected water supplies and sanitation, poor hygiene, and poor quality of available water, as well as poor understanding of these factors and other related health matters. Much of the malnutrition in turn is believed to be associated with a high incidence of diarrhea and infectious diseases, and poor sanitary conditions.

The importance of diarrheas is reflected in data from clinics and hospitals where nearly 40% of hospital deaths of children under four years old were attributed to gastroenteritis in 1981, and where during the same year over 10% of outpatient visits by children under five years of age were for diarrheal diseases. In a survey of diarrheal diseases in 1983, 16.4% of children in rural areas and 14.5% in peri-urban areas had a history diarrhea within the preceding two weeks. Prevalence

rates of diarrheal disease were significantly higher in the lowveld than the high and middleveld as were mortality rates. Attention was drawn to these diseases nationally as a result of a cholera outbreak which lasted from October, 1981 to May, 1982. During this outbreak, 767 confirmed cases of cholera and 31 deaths were reported, mainly from the lowveld and a corridor extending along the migration route from the lowveld to the town of Manzini in the middleveld.

School age children are also affected by schistosomiasis and other intestinal parasites. Transmission of schistosomiasis does not take place in the highveld. The prevalance of Schistosoma haematobium is highest in the middleveld where it reaches 28.8% among school children. The prevalence of Schistosoma mansoni among school children is low except in the lowveld where it is about 18.5%. Intensity of infection is generally low and the disease is not considered a major problem at present except in the northern lowveld where prevalence rates for S. haematobium and S. mansoni are high and both children and most adults are infested with one or both parasites. It is in this area and in the Lomati River Basin that schistosomiasis is considered an immediate problem.

Among other parasites, prevalence rates of which are influenced by water, sanitation, and hygiene, only Ascaris appears to occur with significant frequency, and then primarily in the highveld where it is present in about 30% of school children. Local pockets of high prevalence approaching 80% have been detected in the highveld, however. There is little amoebic dysentery, Giardia, or hookworm, and tapeworm is rare.

1.1.2 National Health Policy and Priorities

A National Health Policy formulated by the Ministry of Health was approved by the Cabinet in August, 1983. The objective of the Ministry of Health identified in this policy statement is "to improve the health status of the Swazi people by providing preventive, promotive, rehabilitative, and curative health

services which are relevant and accessible to all." To achieve this objective a strategy was approved for the provision of primary health care, placing emphasis on the prevention of disease. The highest priority of the Ministry of Health is assigned to the establishment of a comprehensive primary care system, basic elements of which include (1) the provision of health education, (2) the promotion of food supply and proper nutrition, (3) the promotion of clean water supplies and basic sanitation, and (4) prevention and control of endemic diseases. Programs which focus on environmental and life style interventions are key priorities.

The Fourth Five Year Plan for the period 1983-1988 is consistent with the National Health Policy, and is directed at reducing infant and child morbidity and mortality with special emphasis on diarrheal diseases, immunizable diseases, and malnutrition as well as increasing child spacing. Priorities are placed on programs having the greatest potential for improving the health status of the broad majority of the people of Swaziland. After manpower development, these are (1) water and sanitation, (2) maternal and child health, including oral rehydration, (3) health education, (4) and communicable disease control.

The Ministry of Health, at a meeting of the Water and Sanitation Subsectoral Committee, approved on 23 May, 1983, a policy on water and sanitation, the purpose of which was to outline a policy to guide Ministry activity in the sector.

1.2 Rural Water Borne Disease Control Project

The Ministry of Health anticipated the emphasis which would be placed on diarrheal and other diseases related to water and poor sanitation which together were recognized as major threats to good health in Swaziland, causing high morbidity and mortality especially among the young. To address the problem the Ministry

of Health with funding from U.S.AID, implemented a Rural Water Borne Disease Control Project which provided a focus within the Ministry on water related diseases in rural areas.

1.2.1 History

The Rural Water Borne Disease Control Project was conceived in 1979. The effective date of the project was 24 November, 1980 and the estimated completion date was 30 November, 1985. The first technical advisor arrived in Swaziland in February, 1981, and the project completion date was extended first to 28 February, 1986 and subsequently to 30 September, 1986. The contract was extended from 30 September, 1985 to 31st March, 1986, and subsequently to 30 September, 1986.

1.2.2 Goals

The ultimate goal of any health project is to improve the health status of the population. The Rural Water Borne Disease Control Project was designed to provide a focus on the group of diseases which were among the most important causes of morbidity and mortality in Swaziland and on the most vulnerable target group. Thus, the specific goal of the project was the reduction of diarrheal and other diseases related to water and sanitation among rural populations.

The immediate goal of the project was to improve use and control of water and sanitary practices of the rural population. Institutional capacity to implement programs for the control of water-related diseases was seen as a serious constraint to achieving this goal, and the project was designed to expand the institutional capacity of the Government to deliver effective preventive health services to meet this goal.

1.2.3 Strategies

The major emphasis of the project was behavioral, aimed at improving handling, storage, and use of water; improving sanitation; and reducing contact with contaminated or infested waters. The focus of the project was thus on health education. Social science and epidemiological support was provided to furnish a base for planning and implementation of health education programs and activities and for establishing priorities for siting of water supplies and sanitation facilities. Support for public health engineering and sanitation were provided to assure that appropriate attention could be given to health aspects of water supplies and other water resource development projects and to assure that sanitation programs could respond to demands. In practice there is no one key element in improving environmental health: the key to achievement of the goals of the Ministry of Health and of the project was the focus of activities under diverse units of the Ministry and other related units of Government on a common purpose and their effective coordination.

In actual implementation of the project several overiding strategies were followed to achieve project objectives, placing major emphasis on:

- focussing all project elements on common goals
- coordination of activities under individual project elements, construction, and support programs within the Ministry of Health and related Ministry and Units of Government
- planning for development of the water supply and sanitation sector in Swaziland
- strengthening of the institutional base to carry out sectoral planning and programs of implementing and support units

- providing technical assistance and financial support for facilities and materials to assure that limited budgets would not frustrate efforts to implement programs and activities under the project and to meet sectoral development goals.

Thus, purpose and goals of individual project elements were established to meet overall project goals, and strategies adopted were in general guided by overall project implementation strategies. They are defined in sections devoted to individual project elements and other activities which do not fall nicely within the scope of these project elements, such as sectoral planning, coordination and linkage, and construction of water supplies.

1.2.4 Project Inputs

The Rural Water Borne Disease Control Project provided inputs in five specific areas essential to achieving the goals of the Ministry and to implementing national health policy, each operating through a counterpart unit or agency:

Health Education (Health Education Centre, MOH)
Social Sciences (Health Education Centre, MOH)
Public Health Engineering (Rural Water Supply Board, MONR)
Sanitation (Health Inspectorate, MOH)
Epidemiology (Bilharzia Control Unit, MOH)

Direct inputs were provided in the form of:

- Technical Support (see Table 1.1):
  - Long term technical advisors in:

Health Education	3.5m/y
Social Sciences	2.5m/y
Public Health Engineering	5.0m/y
Sanitation	3 m/y
Epidemiology	4 m/y
TOTAL	18 m/y

  - Short term consultancies (including consultancies paid for completely or in part under other U.S.AID funded projects) in:

SUMMARY OF TECHNICAL ASSISTANCE INPUTS

PROJECT COMPONENT	NAME	TYPE OF ASSISTANCE	DATES	INPUT (Person months) ACTUAL	Project PAPER	PURPOSE
Public Health Engineering	A.W. Hoadley	Long Term TA	1/10/81-30/9/86	60	60	Public Health Engineer Advisor.
	D. Okun	Short Term Cons.	26-28/7/82	0.1		Prepare Scope of Work for Manpower Assessment.
	D. Warner	Short Term Cons.	2-17/9/85	0.5		Assistant in Preparation of Workplan for Sect. Planning.
	C. Hafner	Short Term Cons.	2-17/9/85	0.5		Assistant in Preparation of Workplan for Sect. Planning
	D. Yohalem	Short Term Cons.	9-21/2/86	0.4		Assist in Prep. of Policy & Strategy for Sectoral Development.
	D.Yahalem	Short Term Cons.	1-14/6/86	0.5		Assist in Organizing and Conducting National Seminar.
	R. Gearheart	Short Term Cons.	9-21/2/86	0.4		Assistant in Preparation of Policy & Strategy for Sectoral Development
	R. Gearheart	Short Term Cons.	11-26/7/86	0.5		Assist in Preparation of 2-Year Action Plan for Sectoral Development.
Sanitation	W.P. Lawrence	Long Term TA	27/4/81-21/6/84	37	36	Sanitarian Advisor
	H. Phillips	Short Term Cons.	7/9/83-25/10/83	1.6		Management in Health Inspectorate
Epidemiology	J.P. Chaine	Long Term TA	21/6/81-31/8/85	48	36	Epidemiologist Advisor
	R. Ryder	Short Term Cons.	18/10/82-3/11/82	0.5		Recommend Surveillance System for Diarrhoeal Disease
	H. Gelfand	Short Term Cons.	14/8/84-7/9/84	0.75		Review Diarrhoeal Disease Surveillance Results and Recommend Follow-up Activities.
	D. Semmelink	Short Term Cons.	16/4/84-1/6/84	1.5		Write Computer Programmes for Schisto Data Storage and Analysis.
Health Education	W.F. Shaw	Long Term TA	1/12/80-31/5/82	18	48	Health Educator Advisor
	W. Hoff	Long Term TA	1/2/83-31/1/85	24		Health Educator Advisor
	H.G. Gustafson	Short Term Cons.	31/7/82-13/8/82	0.5		Review Health Education Programme
	E. de Fossard	Short Term Cons.	4-22/10/82	0.6		Assist in Presenting Development Communications Workshop
	E. de Fossard	Short Term Cons.	1/2/83-5/3/83	1.1		Conduct Workshop for Planning Radio Campaign.
	E. de Fossard	Short Term Cons.	9/6/84-31/7/84	0.4		Conduct Workshop for Planning Mass Media Campaign.
	B. Booth	Short Term Cons.	4-22/10/82	0.6		Assist in Presenting Development Communications Workshop.
	R. Greenberg	Short Term Cons.	4-22/10/82	0.6		Assist in Presenting Development Communications Workshop.

SUMMARY OF TECHNICAL ASSISTANCE INPUTS (Continued)

PROJECT COMPONENT	NAME	TYPE OF ASSISTANCE	DATES	INPUT (person months) ACTUAL	Project PAPER	PURPOSE
Health Education (Continued)	M. Rubama	Short Term Cons.	25/2/83-25/3/83	1.0		Conduct Workshop for Planning Campaign.
	M. Rubama	Short Term Cons.	21/6/83-26/7/83	1.2		Evaluate Radio Listenership & Revise Radio Programmes and Spots.
	W. Lynn	Short Term Cons.	17/7/84-10/8/84	0.8		Condusct Workshop for Planning Mass Media Campaign.
	M. Tonon	Short Term Cons.	10/8/84-11/9/84	1.0		Review Health Educatien Programme, Design Evaluation.
	M. Lythcott	Short Term Cons.	12/1/86-6/2/86	0.8		Conduct Workshop on Community Participation.
	J. Faigenblum	Short Term Cons.	12/1/86-6/2/86	0.8		Conduct Workshop on Community Participation.
	M. Rasmuson	Short Term Cons.	6-18/11/83	0.4		Review of Mass Media Campaign.
	A. Joof Cole	Short Term Cons.	6-18/11/83	0.4		Reveiw of Mass Media Campaign.
Social Sciences	E. Green	Long Term TA	5/3/81-6/9/83	30	24	Social Scientist Advisor.

Health education 10.2m/m

Development Communications Workshop
Planning and implementing mass media campaign
Evaluation of behavioral change

Epidemiology 2.75m/m

Diarrhoeal Disease Surveillance
Computer Programming

Sanitation

Management and supervision in the Health Inspectorate 1.6m/m

Sectoral Planning 2.9m/m
TOTAL 17.45m/m

- training:

  ° Participant Training in:

Health Education (B.Sc)	2 years
Graphic Arts (Diploma)	1 year

  ° Workshops in:

  Latrine construction (1)
  Development communications (1)
  Planning and implementing of mass media campaigns (2)
  Community participation (3)
  Management and supervision (2)
  Training of trainers (1)
  Small spring protection (2)
  Laboratory techniques and data interpretation (2)

  ° On-the-job training in:

  Epidemiology
  Sanitation
  Social Sciences
  Health Education
  Public Health Engineering

- Construction of facilities:

  Health Education Centre
  Bilharzia Laboratory

- Equipment:

  Health Education Centre
  Bilharzia Laboratory

- Materials and supplies:

  Health Education Material Production
  Latrine Construction
  Diagnostic and Drug Supplies for Bilharzia Control

The project has been able to draw wholly or in part on resources from other U.S.AID funded projects, including the WASH project, to supplement short term consultant support for:

Sanitation

Management and supervision in the Health Inspectorate

Health Education

Development Communications Workshop
Planning and implementing mass media campaign
Community Participation Workshop

Sectoral Planning

Development of Workplan
Drafting of Policy and Strategy
Drafting of 2-year Action Plan
National Water and Sanitation Policy and Strategy Workshop

The project has been able to shift resources into the support of the construction and rehabilitation of water supplies linked with sanitation and health education.

1.2.5 Project Implementation

The Rural Water Borne Disease Control Project was an activity of the Ministry of health and the Rural Water supply Board and was completely integrated into the programs of these agencies. National Health Policy and the Fourth Five Year Development Plan give highest priority to programs for the prevention of diseases related to water and poor sanitation which are included under the project. Existing institutional mechanisms and capacities were expanded and strengthened to provide

preventive services required to meet targets, coordination was strengthened, and planning was carried out for sectoral development emphasizing national health goals.

Over the five and one half year life of the project many events took place which affected the sector and which have helped to focus attention on its development goals. The evolving needs to which the project has been called upon to respond fit well into the central strategy developed in its early phases and it usually has been possible to respond effectively to the demands placed upon it.

It is thus that during the cholera outbreak of 1981-1982 the project was able to provide support. The outbreak focused national attention on water and sanitation related diseases and it increased public demand for preventive services. It also facilitated a shift in emphasis of the project away from schistosomiasis to a focus more on the prevention of water and sanitation related diseases, especially diarrhea, which constitute a much more important problem than schistosomiasis (although the problem of schistosomiasis should not be forgotten). It also helpd to focus attention on the need for coordination and linkage of preventive measures.

Cyclone Domoina, which occurred in early 1983, again provided an opportunity for project support, and strengthened the shift from a prime focus on health education which became a supporting activity essential to the success of projects and sectoral development. The project became better balanced.

Issues affecting the implementation of sectoral development projects and the continued realization of their benefits became ever more critical. As funding for capital projects began to wane, the Rural Water Supply Board found itself putting its energies increasingly into preparation of proposals, appraisal missions, and evaluations at the expense of planning and design. As the level of expatriate technical assistance declined, the pressures on staff increased. The need for effective community

mobilization, always evident, became ever more critical, and the need for linkage of health education, latrine construction, and hygiene with construction of water supplies ever more evident. At the same time water supplies constructed under programs outside of the Rural Water Supply Board began to fail because many of these systems were not built to a satisfactory standard and no provision was made for maintenance. Increasingly, pressure was put on the Rural Water Supply Board to assist in maintaining these systems, many of which required major renovations. The need for planning to guide sectoral development and to assure that all elements of effective sectoral development were clearly understood and integrated into an overall sectoral development program became more urgent and generally appreciated. A climate was created in which planned development and inter-agency coordination became very important.

The Project has spanned a period of dynamic development in the sector. Its five and one half year lifetime gave it the opportunity to help plant seeds, help support their development, and see them bear fruit. It has been flexible, adaptable, and responsive to needs. It should be noted also that activities under the Rural Water Borne Disease Control Project have been carried out in collaboration with closely related projects in health (Manpower Development, Health Planning, Mass Media for Health Practices) and rural water supply. The close interaction among these projects and their focus on common goals has been essential to progress in development of water supply and sanitation as a component of Primary Health Care in Swaziland.

Finally, support for the project was effectively provided by both the Academy for Educational Development/Washington and by U.S.AID/Swaziland. A.E.D/Washington provided support, assisted in recruitment of project staff and consultants, and arranged key supporting activities which contributed immensely to the implementation of the project, and especially to building development communications support. All have had an impact far greater than that on this project alone. The active involvement of U.S.AID/Swaziland and their responsiveness to needs as well as

their energetic support of related activities have greatly facilitated its implementation and enhanced the achievement of its ultimate goals.

1.2.6 Project Accomplishments

End of project status and outputs were identified in the original project documents. These were ammended in 1984 to reflect changing needs and constraints encountered. The status of project outputs called for in the original documents and its ammendments is summarized in Table 1.2.

But the major impacts of the project must be seen in terms of their stimulation and support of effective development in the sector as a means of attaining health goals, and of development in general in Swaziland. The achievements of the project must be measured in terms of their contribution to sectoral development and its success in improving or establishing the institutional capacity to improve the health and welfare of the rural population. Major achievements which were supported by the project and to which the project contributed include:

- Demonstrating the effectiveness of mass media support which had an impact beyond this project leading to a successful ORS campaign, EPI campaign, training, and development communications support

- Development of a strategy for achieving coordination among governmental and non-governmental agencies and organizations and establishment of an institutional base for its implementation

TABLE 1.2

STATUS OF OUTPUTS
RURAL WATER BORNE DISEASE CONTROL PROJECT
(CONTRACT AND AMMENDMENTS)

OUTPUT	Original Contract	Ammend-ments	Status*	REMARKS
One Swazi will have received an M.S. degree in Public Health Engineering from an appropriate U.S. University. Swazi Engineer will receive on-the-job orientation before depart for training and will have brief turnover period with departing U.S. advisor at end of project.	X	X	I	Swazi B.S.C.E. graduate from U.S. University appointed May, 1985. Strong interest in public health engineering and extra course work in the area. Has received on-the-job orientation and training related to activities of the Public Health Engineering Unit. Further on-the-job training in design, laboratory methods, and environmental aspects of health planned. Graduate training in Public Health Engineering will not be provided under the project but is planned at a later date.
Approximately 2,000 demonstrations will have been conducted in the siting, design, and construction of improved pit latrines.	X		C	It was established by the Ministry of Health at an early stage in the project that demonstration latrines were not appropriate and with the concurrence of U.S.AID/Swaziland, funds for construction were utilized in the latrine construction program of the Health Inspectorate. Demonstration achieved through workshops, on-the-job training, and example in communities.

OUTPUT	Original Contract	Ammend-ments	Status*	REMARKS
All Health Assistants (in Health Inspectorate) will have been trained in siting and construction of improved pit latrines by Senior Health Assistants. Training also will be provided in communication skills and community motivation. Other training for Health Assistants will have been developed as appropriate.	X	X	C	All Health Assistants in the Health Inspectorate have received training on-the-job and in workshops in: Siting Construction of Pit latrines; Communication and Community Motivation. Additional training on-the-job and in workshops has been provided in: Small Spring Protection; Community Participation.
Communities will have become independent in the planning, supervising, and monitoring latrine construction activities, where the community teams worked with and received training from the Health Inspectorate.	X	X	C	Health Inspectorate works through existing committees in communities and organizes community latrine construction programs.
The Sanitation Advisor with Ministry of Health officials will recommend pit design(s) and minimum design criteria appropriate to Swaziland.	X	X	C	Recommended designs were prepared for ventilated improved latrines with concrete slabs and vent pipes using materials which can be purchased at sub-sidized prices through the Ministry and constructed of locally available materials.
Selection criteria for choosing the homesteads which receive the pit latrines will have been developed by the social scientist and Senior Health Assistants.	X	X	C	Selection criteria are those of the Ministry of Health.

OUTPUT	Original Contract	Ammend-ments	Status*	REMARKS
The schistosomiasis survey conducted during the first three years of the project by the epidemiologist and statistician will have provided training to all members of the survey and analysis staff.	X		C	
Laboratory and office facilities will have been expanded and new equipment purchased (for the Bilharzia Control Unit).	X		C	
As a result of the schistosomiasis survey, a sampling framework will be available to the Ministry of Health for further schistosomiasis and other public health surveys.	X		C	The schistosomiasis and other related surveys (intestinal parasites, nutrition survey) provided a framework for future surveys. In addition, recommendations have been made by consultants for surveillance of diarrheal disease at clinics.
Based on the results of the KAP Study, a national health education strategy will have been developed. The strategy will include: - system for health education content design; - communication channels and methodologies; - long-range training and staffing requirements; - one participant trained at the bachelor's level in health education.	X		C	
Community health workers (Rural Health Motivators, Health Assistants, Domestic Science Demonstrators) will have received in-service training and a system will be established to continue on an annual basis.	X	X	C	

OUTPUT	Original Contract	Ammend-ments	Status*	REMARKS
A new central office will have been constructed, and equipped, including two vehicles, for supporting the activities of the Health Education Unit.	X	X	C	
Recommendations made to Ministry of Health on use of Praziquantel to control schistosomiasis.		X	P	Field work completed in December, 1985. Analysis of results in progress. Upon completion of analysis recommendations will be formulated.
A diarrheal disease surveillance study methodology will be developed for use by Ministry of Health in order to decrease incidence of diarrheal disease.		X	I	Field work completed, but analysis of results has been seriously delayed by delays in programming of computer. All parties have agreed to drop this activity.
The formative evaluation of targeted behavior change will be presented to the Ministry of Health for use in planning health education intervention methodologies.		X	I	The services of an outside consultant were obtained to advise on this output. Consultants report indicated that: - Design not experimental due to internal validity and timespan; - Inputs primarily institutional. Therefore cannot draw conclusions from post-KAP. Consultant recommended survey of status post health education inputs be incorporated in MMHP post evaluation. Consultant further recommended not using results from two surveys as basis for assessing impact of project, but for providing status only.

OUTPUT	Original Contract	Ammend-ments	Status*	REMARKS
Influential decision makers (Traditional Healers) will have received training in control of diarrheal disease, including oral rehydration therapy.		X	C	

*C = Completed

P = In Progress

I = Incomplete

- Establishment of a Public Health Engineering Unit with defined responsibilities, with the capacity to meet these responsibilities, and the capacity to grow in its ability to serve the needs of sectoral development and to meet national health and development goals. This Unit provides an important linkage between the Ministry of Health and the Rural Water Supply Board.

- Construction of new water supplies and renovation of one inoperable supply with linkage to latrine construction, health education, and community organization. These projects were designed to provide safe water for over 6,000 people. They also provided an important first experience in coordinated development of sectoral projects, and represent a step towards implementing national policy guidelines for sectoral development.

- Development of standards and guidelines which include:

  - Design and construction standards of water supplies and sanitation facilities.

  - Water quality guidelines

  - Guidelines for review and approval of water supplies

- Development of policy and strategy guidelines for sectoral development and of a short term action plan for meeting national sectoral development goals. A sound institutional base has been established for planning and a process has been established for focusing efforts and implementing programs under the National Action Group.

- Training in all areas of project involvement, both in-country and in the United States.

In other areas, constraints remain which must be overcome if the full benefits of sectoral development are to be realized. For instance:

- It has not been possible to achieve the strengthening of management and supervision in the Health Inspectorate required to make this unit an effective one. While latrine construction has increased greatly, this has been done partly by supplying materials outside of established government procedures. The old constraints which impede purchasing and utilization of existing resources, unstable and largely unused budget allocations, ineffective management information systems, and poor logistical support will become more severe when the project terminates. Establishment and filling of supervisory positions, technical assistance, and training and experience are required if the Health Inspectorate is to be fully effective.

- It has not been possible for the Health Education Centre to provide the support necessary to achieve health education and community participation goals. To a large extent this could be achieved if all the required Health Educator positions were established and filled and if definite responsibilities were given to the field staff to assist in follow-up training and supervision of health education activities of Health Assistants.

While detailed descriptions of the individual project elements appear in the succeeding sections of this report, the following short discussions touch on some of the major accomplishments and issues relating to them.

Health Education. Health Education is a very high priority activity of the Ministry of Health as indicated in the National Health Policy and the Fourth Five Year Plan of the Ministry of Health.

Facilities housing the Health Education Centre were constructed with funding from the Rural Water Borne Disease Control Project.

Staff of the Centre include a Senior Health Educator, three Regional Health Educators located in Mbabane but working in the Regions, an Assistant Graphic Artist, a secretary, and a driver as called for in the project agreement. Establishment of positions for four District Health Educators by October, 1983, was delayed as a result of a Government-wide freeze on the establishment of new positions. However, positions have now been established for a Senior Health Educator, 4 Regional Health Educators, and 4 Assistant Health Educators. Staff of the Unit also include a W.H.O. Health Educator and a graphic artist who is a UNDP volunteer.

While the project was without a Health Educator for a period of eight months in 1982 and early 1983, significant progress was made during this period in providing support for MOH programs focusing on the prevention of water and sanitation-related diseases. This was accomplished by combining resources available under the project with resources available through the Academy for Educational Development under a project for Facilitation of Learning funded by U.S.AID. A workshop on Communications Planning for Health Programmes was held in October, 1982 with participants from development Ministries, Swaziland Broadcasting Services, and other communications media to strengthen development communications and develop collaborative commications strategies for health education. This workshop was followed by a week of training in message design. Policy statements were issued emphasizing the importance of mass media communications in support of preventive health programs. Also stressed was the need for co-ordination and cooperation among Ministries to make the

best use of existing resources and facilities. Recommendations arising from the workshop have led to further training in planning of radio programs, script writing, radio production, the writing of scripts and production 14 radio dramas being used in a mass media health campaign on prevention of diseases related to water, sanitation, food, and personal hygiene; writing and production of 21 radio spots; scheduling and broadcasting of radio dramas and spots; and pretesting and evaluation of programs.

Other outputs were delayed as a result of the change in personnel. These included:

- preparation of a health education strategy;
- preparation of health education materials;
- training of field workers including Health Assistants, Rural Health Motivators, and others.

Following the arrival of the project's new Health Educator, a health education strategy was drafted and submitted to the Ministry for approval. Health education materials for use by extension workers, RHMs, and clinic staff as well as schools were prepared and distributed for use and a manual for adult literacy training is in use. Training supported through the project included participant training in the United States for the Senior Health Education Officer and Assistant Graphic Artist, and workshops for field workers and trainers. Workshops were also conducted for traditional healers to explore ways in which healers and the modern health sector could cooperate to work towards common goals and to begin a dialogue on preventive health, oral rehydration, and other areas of cooperation. These have been successful and a report on cooperation with accompanying recommendations was submitted to the Director of Medical Services.

Social Sciences. The project provided two years of technical assistance in the social sciences which was extended to two and one half years. The purpose of this activity was to provide

information on behavior, attitudes, and beliefs of rural people as they are related to hygiene, environmental sanitation, and health as well as water and water related diseases to provide a basis for the planning and design of health education programs. A second area of investigation was the role of the traditional healer in the treatment and prevention of water related diseases and his potential role in sanitation programs. Other areas of investigation were identified as needs arose. Of particular importance among these was community organization which was studied in response to needs of the Health Inspectorate.

This component of the project provided resources which were drawn upon by virtually all units dealing with water-related diseases at one time or another. The contract of the Social Scientist was extended for a period of six months to September, 1983 at the request of the Ministry of Health in order to assist in the development of a health education strategy, extend study of traditional healer practices, and to conduct a visual perception study. The last of these was not undertaken as it was felt that it would provide no new information. The Social Science Advisor did assist in pretesting of health education materials. This was later expanded to include a study of community organization and mobilization. There was no Swazi counterpart to the Social Scientist, so there was little institutionalization within the Ministry of Health of the capacity to undertake studies of the type carried out under the project for the purpose of providing a data base for planning and implementing projects. Two interviewers were trained in various interviewing techniques, however, and will be available to assist the Ministry. Other water and sanitation projects drew on resources of the University College of Swaziland under contract agreements with the Ministry of Health.

Major outputs under this component of the project included a KAP study and traditional healer study called for in the project documents; surveys requested during the cholera outbreak to assess utilization of emergency water supplies and the efficacy of health education in schools; evaluations of water supplies,

homestead disinfection, and mass media messages; studies of traditional healers as health care providers and identification of strategies for establishing collaborative relationships with the modern health sector; study of traditional beliefs and practices related to diarrheal diseases required for the design of an oral rehydration campaign; and a study of community organization to identify avenues by which to approach and mobilize communities.

While many outputs under this component of the project were called for in the original project documents to meet anticipated needs, it is notable that many of these outputs were requested by the Ministry to meet needs identified which became evident only after implementation of the project began. Thus the study of community organization was undertaken because more effective access to communities was needed by the health Inspectorate. An understanding of practices with respect to diarrheal disease was required to plan and implement mass media campaigns; knowledge of traditional healers was needed to draw this cadre into collaboration with the Ministry and strengthen the delivery of preventive and curative services. All have been carried out in close collaboration with staff of units concerned and have been or will be utilized by them.

Epidemiology. The project provided technical assistance over a period of three years to conduct a national survey of the prevalence of schistosomiasis and other parasitic and water related diseases, provide on-the-job training for staff of the Bilharzia Unit, and expand and equip laboratory facilities to provide the capacity for an expanded analysis program. This was extended to four years to provide training of a recently appointed Health Inspector in charge of the Bilharzia Control Unit and conduct trials of treatment with praziquantel as a control strategy. As indicated in the discussion of project focus, whereas the project documents indicated that the epidemiologic component of the project would develop the capacity to provide basic data on schistosomiasis and other water-related

diseases, the emphasis was clearly on schistosomiasis and the schistosomiasis survey was the predominant feature of this component of the project.

Surveys of schistosomiasis and vector snails were completed and will form a basis for the development of health guidelines for irrigation and other water resources development projects. They have been used to help identify priority areas for the development of water supplies in the Lowveld and will be utilized to identify priority areas for health education on schistosomiasis.

The survey activities also provided an opportunity for staff development and updating the emphasis of schistosomiasis control activities. These activities are now targeted on the areas of highest prevalence.

However, schistosomiasis is not considered a priority health problem in Swaziland, and this is indicated in the Fourth Five Year Plan in which schistosomiasis is not assigned a priority. Consequently, in February, 1982, the Ministry of Health met to review the epidemiology component of the project, to identify priorities and needs of the Ministry, and to establish how the project could best respond to these needs. Concern was expressed over the strong emphasis on schistosomiasis under the epidemiologic component as this had a relatively low priority in the Ministry and the activities of the other components of the project were increasingly directed at diarrheal diseases which were given very high priority by the Ministry.

It was requested that the project provide a consultant to review the status of diarrheal diseases in Swaziland and advise on a program for surveillance.

A consultant on diarrheal disease under the project visited Swaziland in October, 1982 and recommended surveillance in sentinal areas to establish the nature and extent of the diarrheal disease problem in Swaziland. Plans were prepared to

implement surveillance in selected areas served by Rural Health Motivators. Implementation was delayed until October, 1983 as a result of delays in the payment of Rural Health Motivators.

Training of staff of the Bilharzia Unit has provided the capacity to identify Schistosoma mansoni and intestinal parasites. This capacity can serve to enhance the diagnostic capacity of the Ministry and provide added capacity to identify and treat schistosomiasis and other parasites among school children, thus extending the benefits of the existing program. The staff has also been enhanced by the assignment of a Health Inspector to head the Unit. Training of this Health Inspector was undertaken to prepare her for leadership of the Unit.

Investigations were undertaken of the identification of urinary schistosomiasis cases through initial screening using test strips for the detection of blood and protein. This permits testing and treatment by school teachers, thus relieving staff of the Bilharzia Control Unit to concentrate their energies on areas affected by intestinal schistosomiasis, high risk areas, and detection and treatment of other intestinal parasites. To date nearly 20,000 student examinations have been carried out by teachers in middleveld schools.

Finally, investigations were initiated to establish the feasibility of employing treatment with praziquantel to achieve control of schistosomiasis in areas where prevalence rates are high. Fieldwork is nearing completion and results will be assessed in early 1987 for consideration in developing a schistosomiasis control strategy.

Public Health Engineering. Public Health Engineering capability did not exist within the Swaziland Government prior to the start of the project. The project provided technical assistance for a period of five years and participant and on-the-job training to develop the institutional framework and

staff to assure that health criteria would be incorporated into the designs of all water resources development projects. Designs of all water works were to be reviewed from a health perspective.

The establishment of a position for, and selection and training of, a Public Health Engineer were key elements of this component of the project. A position was first established in the Ministry of Health in March, 1982 and a recently graduated engineer was temporarily assigned to a position with the Rural Water Supply Board in February of the same year in anticipation of the upgrading of this position. However, this engineer resigned from Government service in March leaving the position vacant. It was eventually agreed by the Ministry of Health and the Rural Water Supply Board that a position for the Public Health Engineer should be established at an appropriate grade within the Rural Water Supply Board and that this position should be filled by an engineer expected to graduate in June, 1983. This provided an opportunity for career development for the Public Health Engineer and provided an advisor to the Rural Water Supply Board on matters relating to health. The Public Health Engineer was employed on a temporary basis in anticipation of the establishment of the position, and finally resigned to take up a position in the private sector.

A third Engineer, trained in the United States under a U.S.AID fellowship, returned to Swaziland in May, 1985 to take up the position of Public Health Engineer which had been created in the Rural Water Supply Board. He has received limited training on-the-job within the Public Health Engineering and Design Units of the Rural Water Supply Board. The delays incurred in filling the position of Public Health Engineer, however, made it impossible to provide either participant training or subsequent on-the-job training.

In addition to serving as an advisor to the Rural Water Supply Board and other Ministries, the Public Health Engineer directs the Water Quality Laboratory of the Board and the water quality sampling program and inspects water supplies and other

water resources development projects. Water quality standards have been prepared and have been circulated by the Ministry of Health for consideration by appropriate Ministries. The Public Health Engineer will assist the Ministry of Health during the planning of water resources development projects to assure that health criteria are incorporated into their design.

Other activities directed at the strengthening of the institutional framework for Public Health Engineering included the establishment of a water and sanitation policy and a Five Year Plan for the Ministry of Health. Program related activities included recommendations for provision of safe water to high risk peri-urban areas, evaluations, impact studies, outlining of regulations for recreational use of dams, and training in spring protection for Health Assistants.

A Health Inspector has been assigned to the Public Health Engineer Unit to assist in carrying out the responsibilities of the Unit and assuring coordination with the Ministry of Health. It remains for the Unit to establish the scope of its responsibilities and its specific role and authority on environmental health issues in coordination with the Ministry of Health and other Units of government.

Sanitation. The promotion of clean water supplies and basic sanitation is given priority second only to health education in the National Health Policy and second only to manpower development in the Fourth Five Year Plan. Ministry support was reflected in an increase in the budget of the Health Inspectorate for materials from E11,000 in 1982-1983 to E26,000 for the 1983-1984 fiscal year. However, this increase has since been lost.

The primary objective of the sanitation component of the project was to build the capacity of the Health Inspectorate to promote and assist with the construction of at least 1,000 latrines per year by the end of the project.

Project inputs include three years of technical assistance, funds for the construction of demonstration latrines, and in-service training of Health Assistants in collaboration with the Health Education Unit.

A variety of constraints limited the capacity of the Health Inspectorate to meet demands made upon it. These included transportation, material support, and above all, efficient organization and management. In spite of these constraints, latrine construction increased from fewer than 150 latrines completed in 1979 and 106 latrines under construction at the end of that year to about 1,000 completed in 1986. This has been accomplished through improved utilization of available transportation including assistance from the Rural Water Supply Board and the purchase through the project of 2½-ton truck, more efficient organization of construction of slabs by recipients at central locations, increased material support under the project, and improved management. The Ministry has also approved promotion of local materials for construction of latrine slabs to reduce costs and increase productivity and coverage. However, even limited budgets have not been utilized and transportation and management continue to be constraints.

Major inputs have been directed towards planning for the strengthening of the Health Inspectorate to enable it to meet targets. A water and sanitation policy was prepared and approved, a Five Year Plan containing targets for latrine construction and manpower development was approved, a training plan for Health Assistants was approved by the Ministry and forwarded to Establishments and Training, a Scheme of Service was prepared for the Health Inspectorate which should increase retention of staff, an improved reporting system was implemented, and field supervision was improved. A WASH consultancy also provided the Ministry with specific recommendations for the further strengthening of organization and management of the Health Inspectorate and training required for effective management of

the Unit. A Deputy Senior Health Inspector was appointed to strengthen management, but has not been on the job since early 1986.

Implementation of activities called for under the project evolved in response to needs and departed somewhat from activities as originally conceived. Thus, early in the project it was agreed by all parties that a demonstration latrine program was not appropriate and that the material support available under the project should be directed to support of the ongoing latrine construction program. It was found through experience that narrowly focused sanitation committees, 200 of which were called for in the project documents, were not appropriate. Effective promotion of latrines is more appropriately achieved through existing mechanisms which include extention workers such as Rural Health Motivators who can involve Health Assistants or existing committees in communities. Results received from about one-half of the Health Assistants indicated that in October, 1982 they were working with 45 existing Health, School, or Clinic Committees which had broader roles and were thus more viable and effective. In order to provide further guidance to Health Assistants and to assist them first in identifying communities and other vehicles for mobilization of communities, a study was undertaken of factors influencing development and the committee structure of rural communities. This has been used to plan community involvement.

In-service training of Health Inspectorate personnel during 1982 was delayed by the absence of a project Health Educator. Nevertheless, one workshop was presented in July of that year. With the arrival of the project Health Educator in February, 1983, two workshops on community participation, a priority need of Health Assistants, were held in 1984; an additional workshop on community participation was held in 1986 with assistance from the WASH Project. Two workshops on spring protection were held in 1985, as well as a workshop on management and supervision and a follow-up workshop on the same subject for Health Inspectors and Senior Health Assistants.

Other. Many acitivities undertaken under the project cannot be considered activities of a single unit or a single component of the project, even though described under individual project elements. Major emphasis has been placed on coordination and common goals and focus in sectoral development, and of necessity, many activities demanded the joint participation of several units. These included workshops and other training activities, implementation of preventive programs in high risk areas, and assessment of impacts in which collaboration has taken place. Several initiatives which received major support from the project were joint activities of this kind which were directed at coordination to achieve optimal health benefits of sectoral development activities. The first of these was strengthening of coordination among units providing health education and assistance to communities for the construction of water supplies and latrines. This was both supported and tested during the construction of 8 water supplies with funding from the project. While not achieving the level of coordination desired, this activity demonstrated how coordination should take place and was an important step in moving towards effective linkage of water supply, sanitation, and health education.

Finally, planning for sector development was initiated under the National Action Group. A sound institutional base for planning was established which can continue to carry out this key activity. This planning activity involved all Ministries as well as non-governmental organizations and the private sector. Out of this activity came a national policy to guide sectoral development in pursuit of national health and development goals, strategies for achieving goals, and a practical 2 year action plan identifying specific programs and activities to implement policies and strategies.

It was, in the last analysis, these activities which brought together and put to the test all the activities under the project during its 5½ year life.

CHAPTER II. PUBLIC HEALTH ENGINEERING

2.1 Background

Public Health Engineering, as it was conceived under the Rural Water Borne Disease Control Project, did not exist in Swaziland at the start of the project. The qualifications required of the Public Health Engineer were unique. Yet the need was real, and the concept a progresssive one which carried the potential of great benefit directly within Swaziland and indirectly as a demonstration of what could be achieved and how the function of the Public Health Engineer could be carried out elsewhere. The challenge was (1) to define the role of the Public Health Engineer clearly, (2) to establish an institutional framework within which he could work effectively to meet his objectives, including organizational structure, linkages, and guidelines, and (3) to recruit and train a counterpart engineer.

2.2 Purpose

It was the purpose of the Public Health Engineering component of the project to develop the capacity to provide a public health engineering perspective in the design of water supplies and in the planning and implementation of other water resource development projects, to assure safety of water supplies, and to minimize adverse impacts of water resource development projects.

2.3 Objectives

Specific objectives defined in the project documents are limited in scope and include:

- Development of criteria for the design of water supply systems as well as criteria for use in selecting target communities to receive water supplies and excreta disposal systems;

- Review of all designs and plans for irrigation works, dams, canals, reservoirs, and drains to determine potential health implications, particularly with regard to schistosomiasis; with recommendation of feasible engineering. This objective was considered too all inclusive in terms of needs and inappropriate in terms of the effective use of the time of the Public Health Engineer at this stage in the development of the Unit. It was therefore agreed between the Senior Engineer, Senior Health Inspector, Regional Health Development Officer, and the project that this objective would be dropped in favour of specific activities identified in the workplan for the Public Health Engineer;

- Recommend alternatives to minimize potential negative health impacts;

- Provide participant training for counterpart Public Health Engineer at the B.Sc. level in Civil Engineering with an emphasis on water related studies;

- Provide on-the-job training for counterpart Public Health Engineer over a period of two years in public health aspects of engineering design. This was modified to provide on-the-job training prior to departure for participant training and a brief turnover period upon his return.

2.4 Project Inputs

Actual project inputs consisted of the following:

Technical Assistance

Long Term	-	5 person years
Short Term	-	2.9 person months

Financial Support

- Travel to Evaluation Workshop for Senior Engineer and Public Health Engineer Advisor.

- Travel to Sectoral Plan review in Lusaka for Senior Engineer, Planning Officer and Public Health Engineer Advisor.

Long term technical assistance matched that provided for in the project documents. Short term consultancies were all related to sectoral planning. All were provided through the Water and Sanitation for Health (WASH) Project, although the greater part of their costs were paid from the Rural Water Borne Disease Control Project.

2.5 Strategies

To establish a public health engineering activity which can serve the broader needs of the sector and the purpose for which it was originally conceived, and continue to do so, implies much more than is stated in the purpose and objectives of the project. Thus, strategies for institutional development and implementation were adopted early in the project which consisted of:

- Establishment of an organizational unit with a position for the Public Health Engineer in an appropriate Ministry, along with functional linkages with other appropriate Ministries;

- Recruitment and training a counterpart Public Health Engineer;

- Establishment of a scope of work and workplan including clear definitions of responsibilities;

- Establishment of guidelines recognized by all concerned agencies and organizations to provide an authoritative framework within which to operate, to assure safety and benefits of sectoral development projects, and to minimize adverse impacts of water resource development projects;

- Establishment and staffing of a supporting Water Quality Laboratory;

- Implementation of activities defined in the scope of work and workplan.

2.6 Accomplishments

Accomplishments can be understood best when viewed in relation to strategies. These in turn were either institutional or operational. Progress in both strategic areas has been good and a firm institutional base has been established which is effective in providing public health engineering services. Implementation of activities of the Public Health Engineering Unit and establishment of the Water Quality Laboratory were assisted by a Canadian Assistant Public Health Engineer and Water Quality Analyst. The Assistant Public Health Engineer was in Swaziland from July, 1984 to December, 1985; the Water Quality Analyst from February, 1982 to August 1984.

To be effective, it is essential that an institutional base be established with clear responsibilities and recognized authority. Much effort under this component of the project has been devoted to establishing an institutional base for public health engineering and framework within which the public health engineering activity can operate:

- Establishment of a Public Health Engineering Unit and position for a Public Health Engineer. Prerequisite to recruitment and participant training of a Public Health

- Establishment of a Public Health Engineering Unit and position for a Public Health Engineer. Prerequisite to recruitment and participant training of a Public Health Engineer was the establishment of a position for him. As originally conceived, this was to be within the Ministry of Health. Early in 1982, a position was established within the Ministry of Health but at a low grade. It was, furthermore, considered inappropriate to locate the Public Health Engineer in that Ministry as there was no career structure into which he could fit and no opportunities for promotion or advancement. A position was therefore established and a Public Health Engineering Unit was created within the Rural Water Supply Board in late 1983;

- The scope of responsibilities of the Public Health Engineer was set out in the application for establishment of the post, and included:

  . Advise RWSB on matters regarding policy of rural water supplies as they pertain to health and environmental issues.

  . Develop guidelines for planning and design of water systems, in close co-operation with the RWSB Design Office.

  . Direct the activities of a water quality surveillance unit and testing laboratory.

  . Develop guidelines and programs for surveillance of water quality at rural water supply systems.

  . Review pre-design and final design plans for concurrence with accepted water quality and health standards for rural water supply schemes.

- Conduct field inspections of existing rural water supply schemes and prepare recommendations for improvements based on water quality criteria.

- Develop appropriate methods for optimizing water quality at minimal cost to communities.

- Maintain liaison with Construction and Maintenance Units to ensure improvements in water quality standards through effective interaction between Public Health and the aforementioned.

- Develop guidelines for the legislative protection of water supply sources for the benefit of all rural communities.

- Assist in the preparation of plans for the rural development of health and sanitation in Swaziland.

- Develop training sessions and workshops in areas relating to public health and water and sanitation engineering.

- Two Public Health Engineers trained in Canada were appointed, one in 1982 and one in 1983, but resigned to enter the private sector. The incumbent was recruited following graduation in 1984 from an American institution where he studied civil engineering and received support from U.S.AID funds. Following a period of work in environmental engineering at Berkeley, he took up his present position in May, 1985. In his academic training he emphasized water quality and environmental engineering. He is well suited to the job of Public Health Engineer.

- Training of the Public Health Engineer has been conducted on-the-job, first by exposing him to all activities of the unit. He has participated fully in these. He has also worked in the Design Unit to build his familiarity with water systems and their design in Swaziland. In doing this, he has developed his competence in an area essential to his public health engineering activity. He spent the remainder of the project in the Public Health Engineering Unit which he must take over. The short period of training and experience in the unit is insufficient to prepare him fully to run the unit and serve as a source of expertise to all units of government. Assignment to the Construction Unit and on-the-job training with a counterpart Public Health Engineer are necessary to strengthen his background and expand it into new areas of environmental health related to water resource development in which he will in future be expected to participate as well as to solid wastes and air pollution. Participant training is not seen as the immediate priority need, although it is planned following a period of experience in the Unit. On-the-job training and experience are viewed as most beneficial to both the incumbent and the government in the immediate future;

- A Health Inspector was assigned to the Public Health Engineering Unit in March, 1985 to assist in implementing the activities of the unit and assure liaison between the RWSB and the Ministry of Health. In October of 1985 he was assigned to a two-year diploma course in Public Health Engineering in Mauritius, and was immediately replaced by a second Health Inspector. Both Health Inspectors have performed well and have created an important link between the two Ministries. Linkage between Ministries can be very effective at the working level. It is often limited when there is a need

to liaise at higher administrative levels. The Public Health Engineer will have to provide this linkage when it is required;

- Training of the Health Inspector/PHE has taken place on-the-job through participation in activities of the unit. An effort has been made to expose both incumbents to as many field situations as possible. Training of the present incumbent in planning, design, and construction of small spring protections is being started so the Health Inspector can take on an increasing responsibility for providing assistance to Health Assistants as well as assisting the Public Health Engineer. The incumbent Health Inspector/PHE is scheduled to depart for the diploma course in Mauritius upon the return of the Health Inspector presently in training.

- Guidelines have been prepared by, or with the full participation of, the Public Health Engineering Unit. These include:

  . Water quality guidelines
  . Standards for design of water systems
  . Guidelines for review and approval of projects.

  The water quality guidelines have been approved by the Ministry of Health. The design standards are generally accepted and applied. In addition, a framework has been drafted for development of guidelines covering health aspects of recreational waters.

- The Public Health Engineering Unit has played a major role in sectoral planning activities covered in section VII. National guidelines for development of the water supply and sanitation sector in Swaziland and the

two-year action plan prepared as part of these activities include many elements which involve the Public Health Engineer. These include:

- Construction of new water systems,
- Rehabilitation of failed systems,
- Maintenance of water supplies,
- Planning and design of water systems,
- Water quality surveillance,
- Sanitary inspection,
- Inventory of water supplies,
- Inter-agency coordination,
- Provision of technical assistance,
- Review of proposals for water supply and sanitation projects,
- Evaluation,
- Preparation of a five year master plan for sectoral development.

- A water quality laboratory has been established with assistance from the Canadian Water Quality Analyst and financial support under British aid. The laboratory was developed in collaboration with the Public Health Engineer and is under his supervision. The Public Health Engineer provides guidance to and training of laboratory staff, regularly reviews data and procedures, and provides follow-up where required. The laboratory carries out routine surveillance and provides support for special studies and technical assistance activities.

Simultaneously, with the building of a sound institutional base from which the Public Health Engineer can operate, the Public Health Engineering Unit has been actively involved in carrying out its responsibilities and in meeting special needs under emergency conditions. Thus:

- During the cholera outbreak of 1981-1982, the Public Health Engineer assisted in:

  . recommending measures to provide water in high risk peri-urban areas paid for by the Ministry of Health,
  . participated in emergency planning meetings,
  . recommended procedures for emergency disinfection,
  . undertook and coordinated field sampling and laboratory testing,
  . was a member of a special Swaziland/South African Cholera Committee.

- Following cyclone Domoina in January 1984, the Public Health Engineer participated in the assessment of damage to water supplies, the preparation of proposals for repairs, monitoring of purchasing and the approval of work done.

Routine activities established in the Public Health Engineering Unit include:

- Participation in source investigations, planning, and design of water supplies;

- Provision of technical assistance to other agencies planning and design water systems as well as to individuals or institutions experiencing water quality problems;

- Conducting sanitary inspections at water supplies and providing follow up;

- Conducting special studies to assess performance of treatment processes and infiltration galleries;

- Conducting evaluations. Those completed include:

  . water system at Ntsintsa,
  . effect of salinity on water consumption,
  . utilization of wash-houses.

In addition, the Public Health Engineering Unit has carried out other activities including:

- Recommending priority areas for development of water supplies. Priorities have been recommended for drilling of test boreholes under a CIDA/Swaziland Groundwater Exploration Project. Drilling will be scheduled first in priority areas so that boreholes can be utilized for supply of water. High priority was given to the Sithobela - St. Phillips area most severely affected during the cholera outbreak, areas of the northern lowveld where prevalence rates of schistosomiasis are very high, and in the southeastern lowveld where water is very scarce;

- Providing assistance in training Health Assistants in protection of small springs through two workshops and drafting of a spring protection manual;

- Conducting two workshops on laboratory methods and sampling surveys for laboratory technicians;

- Preparing a manual on latrine construction for extension workers.

- Working with the Bilharzia Control Unit to:

  . improve the health environment in high risk areas, notably estates
  . assess health risks at dams
  . assess bilharzia control strategies

- draft guidelines for plannning and review of water resource development projects.

- Working with the Health Inspectorate to establish linkage of latrine construction and health education with the construction of water supplies. Procedures have been agreed upon and implemented on a limited scale. Major efforts will be required to achieve the level of coordination required. (These are considered in detail in section VIII of this report).

2.7 Constraints

The Public Health Engineering Unit is considered an important part of the RWSB. Since the beginning of the project, the Public Health Engineer Advisor and his counterpart have been able to function well within that organization and in collaboration with the Ministry of Health. Constraints have been primarily in the form of delays in:

- Establishment of post;
- Grading of post;
- Availability of suitable candidate for post.

These delays have affected the scheduling of participant training which has not been possible under the project.

Other activities in which the Public Health Engineer has been heavily involved, such as sectoral planning, which strengthen the role of the unit have been delayed. In large measure these delays resulted from the reorganization of Ministries. But once initiated, they have taken place smoothly and with commitment. But training is behind schedule and further technical support of training and implementation are called for as a result.

Other constraints limiting the degree to which certain project objectives have been met include the following:

- Lack of a clear agreement between the Ministry of Health, the Public Health Engineering Unit, and other related units of government such as Town Councils, Water Resources Branch, and Ministry of Agriculture on the scope of responsibilities of the Ministry of Health and the Public Health Engineering Unit. Agreement is required first between the Ministry of Health and the Public Health Engineering Unit on needs, objectives, responsibilities, and procedures. Proposals can then be made to the other involved agencies and units of government.

- Development of effective coordination between the Health Inspectorate and the Rural Water Supply Board is slow and requires much effort. This effort must continue if the benefits of sectoral development are to be realized.

2.8 Recommendations

The institutional base for carrying out the activities of the Public Health Engineer is well established. So are many of his responsibilities. The primary needs are for:

- Strengthening the role of the counterpart Public Health Engineer in liaising with the Ministry of Health;

- Expanding the role of the counterpart Public Health Engineer in the implementation and evaluation of treatment systems for surface sources in mountainous regions which, while highly contaminated at times, can be distributed at low cost. This will involve

collaboration with the Health Inspectorate either to assist in maintenance or to working closely with communities to obtain their full participation.

- Carrying out evaluations in collaboration with the Health Education Centre. These should include:

  . linkage of water supply, sanitation, and health education (implementation)
  . operation and maintenance
  . utilization
  . impacts on knowledge, attitudes, and health
  . financing of maintenance.

- Strengthening coordination with the Bilharzia Control Unit by:

  . instituting regular meetings with the Health Inspector in charge of the Unit to identify problem areas, develop strategies, and assess impacts of control efforts.
  . completing schistosomiasis control strategy
  . finalizing guidelines for planning and review of water resource development projects

- Meeting with the Director of Health Services and appropriate unit heads within the Ministry of Health to define needs vis-a-vis the Public Health Engineering Unit and to agree on how the Ministry and Public Health Engineering Unit can best meet these needs, the responsibilities of each, and procedures for meeting these responsibilities. Areas to be considered will include water and wastes, solid wastes, water resource development activities.

- Strengthening coordination between field officers of the Health Inspectorate and Rural Water Supply Board. This will require constant effort in order to establish firmly the smooth operation of coordinating mechanisms. It will require strengthening of Health Inspectorate staff participation in providing health education and assistance in latrine construction, involvement in planning of water supplies, in meetings, and in working with target communities. Health Assistants will benefit from transport and assistance from the Rural Water Supply Board.

- Supervision of the Water Quality Laboratory.

- Further training on-the-job for the Public Health Engineer, Health Inspector/PHE and laboratory staff.

It is recommended that technical assistance be obtained for a period of two years for the purpose of:

- Strengthening and expanding the role of the Public Health Engineering Unit.

- Strengthening coordination mechanisms with the Ministry of Health and other appropriate agencies and units of government.

- Extending counterpart and related training.

- Extending sectoral planning and assisting in preparation of a 5 year master plan for sectoral development.

- Assisting in research, development, and evaluations.

CHAPTER III. SANITATION

3.1 Background

At the start of the project, the Health Inspectorate was assisting communities in the construction of small spring protections and latrines, but productivity was low. This unit was staffed by three District Health Inspectors, two Senior Health Assistants, and 42 Health Assistants (of 48 trained between 1975 and 1977). Morale was low as a result of lack of opportunity for career advancement, insufficient budget, inadequate logistical support, and insufficient supervision. Between 1976 and 1978 latrines were constructed with assistance from the Health Inspectorate at a rate of 100-160 per year. Complaints were heard that pits dug in anticipation of obtaining assistance in constructing slabs were remaining uncovered and hazardous because the Health Inspectorate could not respond to requests for assistance, which was provided generally to individual homesteads.

3.2 Purpose

The purpose of the sanitation component of the project was to provide support to assure that the Health Inspectorate would be able to respond to requests for assistance from communities in the building of latrines. It was anticipated that by 1985 latrines would be installed at a rate of 5,000 each year and that 40% of rural homesteads would have improved pit latrines. Coverage was expected to increase to 75% by 1990.

3.3 Objectives

Specific objectives of the project were to:

- Appoint and train four Senior Health Assistants to supervise latrine construction;

- Conduct 2,000 demonstrations of the siting, design, and construction of improved pit latrines. It was anticipated that another 20,000 homesteads would benefit through technical assistance and improved organizational strategies. The construction of demonstration latrines as they were conceived was considered inappropriate by the Ministry of Health and the budget for their construction was shifted to augment the Ministry's budget for the purchase of materials for latrines.

- Train 42 Health Assistants in the siting and construction of improved pit latrines by Senior Health Assistants. Training was also to be provided in communication skills and community motivation. This objective was later modified to provide training for all Health Assistants assigned to the Health Inspectorate as the number had fallen below 42.

- Form 200 sanitation committees to serve as resources to rural communities for expanding the construction of latrines. These committees were to supervise and monitor latrine construction in their communities, and assist in the purchase of materials. This was later modified to require only that communities become independent in planning, supervising, and monitoring latrine construction where community teams work with and receive training from Health Assistants. Health Assistants often work with existing committees, and in future joint water and sanitation committees will be formed where water supplies are being considered.

- Develop alternative pit designs and minimum design criteria for latrines. This was later modified to require that the sanitation advisor with Ministry of Health officials recommend a pit design or designs, and minimum design criteria appropriate to Swaziland.

- Develop criteria for selection of homesteads to receive demonstration pit latrines. This was later modified to remove the word "demonstration."

- Train Health Assistants at initial two week workshops followed by one week seminars for discussion of new methodologies and field problems. This was later deleted as training was provided largely in the field and this requirement was considered inappropriate.

- Provide in-service training for 312 community health workers on an annual basis. This was later modified to eliminate the numerical requirement.

It was anticipated further that 80% of sanitation field workers in the Ministry of Health would be actively involved in motivation, training, and supervision of community members in construction, maintenance, and proper utilization of improved latrines.

3.4 Project Inputs

Technical Assistance

Long term	-	3 person years
Short term	-	1.6 person months

Long term technical assistance fulfilled the requirement called for in the project documents.

Financial support for purchase of latrine construction materials between 1982 when materials were first purchased, and 1986 was E72,763.

Provision of a Datsun Caball fitted with a hoist to facilitate transportation of materials for construction.

3.5 Strategies

The major strategy defined in the Project Paper consisted of the construction of 2,000 demonstration latrines at clinics, schools and the homesteads of influential community members. It was thought that these would influence community members to construct and use latrines and that coverage would spread rapidly. This concept of demonstration latrines was rejected as inappropriate. Funds for demonstration latrines were redirected to help finance expansion of the latrine construction program of the Ministry of Health as it appeared more realistic to focus on community organization to achieve more effective involvement in latrine construction and to use funds to enable the Ministry of Health to provide increased material support. In this way a momentum could be achieved in the community and construction at motivated homesteads in communities could influence other community members to construct latrines.

Related to this strategy has been the construction of latrine slabs at centralized points in communities. This has resulted in simplified transportation and storage requirements, more effective assistance from Health Assistants who can serve needs of the whole community, and better use of community resources.

The use of incentives for local trained resource people was considered inappropriate by the Ministry of Health and has not been pursued.

A fundamental requirement to meet objectives of the latrine construction program of the Ministry of Health, which was not recognized in the Project Paper, has been for strengthening of the Health Inspectorate itself. It was realized that without strengthening of procedures in the Health Inspectorate and its organization, support for field personnel could not be effectively achieved. Strategies adopted for strengthening the Health Inspectorate have included:

- Strengthening of management and supervision through
  - . introduction of improved management information systems,
  - . appointment of a Deputy Senior Health Inspector,
  - . training of Health Inspectors through workshops and field visits,
  - . training of Senior Health Inspector;

- Training in latrine technologies and protection of small springs through workshops and field visits to improve technical skills;

- Training in community mobilization and community participation through workshops and follow up field visits.

Other strategies have been aimed at increasing the effectiveness of delivery services through:

- Coordination
  - . with Rural Health Motivators so that motivation and slab construction could be carried out together,
  - . with the Health Education Centre to obtain assistance in training and obtain mass media and material support,
  - . with the Department of Extra Mural Studies, University of Swaziland, to obtain assistance in providing training,
  - . with the RWSB to obtain technical assistance and logistic support; to provide assistance in delivering health education; and to link latrine construction with development of water supplies.

- Promotion of community participation utilizing existing development committees. A survey of community organizations under the Social Science component of the Project was undertaken to provide guidelines and assist Health Assistants in utilizing existing organizations.

Combined water and sanitation committees will be formed as well in future where sanitation is to be linked with development of water supplies;

- Promotion of slab construction from local materials where Health Assistants could not meet demands or people could not afford concrete slabs;

- Expansion of the Health Inspectorate staff to improve coverage.

3.6 Accomplishments

Accomplishments during the lifetime of the project can be viewed best when considered in relation to strategies for meeting goals and objectives. Thus considerable effort went into strengthening of management and supervision including the services of a short-term consultant. Activities directed at strengthening of management and supervision included:

- Appointment of a Deputy Senior Health Inspector. This appointment resulted in improved support of field staff but its effectiveness was reduced because the incumbent found it necessary to carry out many duties unrelated to water supply and sanitation. Although a Deputy Senior Health Inspector was appointed, no position was established and delays were experienced in obtaining housing. The incumbent is an expatriate who has not been in the country since March, 1986. This has resulted in severe constraints to smooth operation of the Health Inspectorate;

- Workshop training in management and supervision for Health Inspectors and Senior Health Assistants with follow-up workshop conducted in collaboration with the Department of Extra-Mural Studies at the University of Swaziland;

- Workshop on management and supervision in Arusha attended by the Senior Health Inspector. This was considered of limited value by the Senior Health Inspector;

- Establishment of an information system for monitoring activity, inventory, and purchasing requirements. This system needs to be developed further and close supervision and follow-up provided if it is to assure that Health Assistants always have the materials they require and if problems are to be identified and solved;

- A scheme of service was prepared including job descriptions, lines of supervision, and career structure for Health Inspectorate personnel. This was submitted to the Department of Establishments and Training in 1983. Job descriptions were later rewritten and resubmitted. No response has been received by the Ministry of Health to date;

- Routine weekly supervisory field visits and attendance at monthly Regional Health Inspectorate staff meetings by the Senior and Deputy Senior Health Inspector in company with the Public Health Engineer. These visits have been largely discontinued because of competing demands on supervisory time;

- The budget for latrine and small spring protection projects was increased from E11,000 in 1983 to E26,000 in 1984. This gain was lost in 1985 when the budget was reduced to E13,000. At the same time, however, existing budgets have not generally been fully utilized.

To build the skills of Health Inspectorate staff and improve performance, training has been and continues to be provided in areas outside of management and supervision. Activities related to training included:

- Preparation of a training plan for the Health Inspectorate to meet needs for planned sectoral development. The plan was submitted to the Department of Economic Planning and Statistics concurrently with the Scheme of Service. No response has been received to date inspite of requests from the Ministry of Health;

- In 1985 a consultant provided by WHO prepared a proposal for training of Health Assistants at the rate of 20 per year over a four year period. This plan was reviewed in detail and extensive modifications were proposed. This training will require external technical assistance and support. No Health Assistants have been trained since 1977;

- Training of Health Assistants during the first three years of the project was conducted primarily on-the-job by the Sanitarian Advisor;

- A one week workshop was held in June, 1982 for Health Assistants and Community Development Officers to review latrine technology and recommend more effective implementation of the latrine program. A secondary objective was to encourage collaboration;

- Two one week workshops on community participation were conducted by the Health Education Centre in 1984 for Health Assistants and others. A two week workshop on community participation was conducted with assistance of the WASH project in January, 1986. While workshops may in themselves be very useful to sensitize participants to needs, and approaches, and to introduce skills, application requires constant support and follow-up. This can be done through monthly staff meetings, field visits, and follow-up workshops. However, for this to occur, Regional Health Educators must be appointed and given responsibility for this follow-up;

- Two week workshops on small spring protection were conducted for Health Assistants and Health Inspectors. These workshops were conducted by the RWSB to develop planning, design, and construction skills of health personnel. Apprenticeships with the RWSB are required and will be provided the Health Inspector/PHE who will in future assist field staff. The RWSB presently provides assistance and training on-the-job to Health Assistants protecting springs;

- The Health Inspector/PHE was enrolled in a two year diploma course in Public Health Engineering in Mauritius in October, 1985. A second is expected to enroll in October, 1986. Upon the return of the Health Inspector/PHE in 1987, his replacement is scheduled to enter the diploma program;

- Health Inspectors are trained at the Institute of Health Sciences. At the start of the project, there were two expatriate Health Inspectors in the Regions in addition to the Senior Health Inspector. The staff of Health Inspectors has increased to its present level of 20 after the loss of the two expatriate and of two Swazi Health Inspectors. The Ministry expects to hire an additional eight to nine during 1986. There are presently 15 unfilled positions for Health Inspectors.

- Training of the Health Inspector/PHE has been conducted on-the-job (see Section II).

Other activities intended to increase and improve latrine construction included:

- Design of a ventilated improved pit latrine and its acceptance as the standard;

- Construction of latrines at centralized locations within communities. Previously slab construction was being carried out at homesteads, placing excessive demands on Health Assistants and transport facilities. Community members now assist in construction by other community members with the aid of Health Assistants, slabs are then be distributed to homesteads;

- One field officer has organized one community to operate its own latrine construction program with great success. Latrines are frequently constructed before houses. This has spread to an adjacent community and should be encouraged by other Health Assistants;

- Planned training of Health Assistants in the Malaria and Bilharzia Control Units who will be enlisted to motivate and assist in construction of latrines. This will take advantage of their coverage of rural areas and their smaller work load during the winter season to increase the staff promoting and assisting in latrine construction;

- A policy of encouraging use of local materials for slab construction when people cannot afford or obtain materials has been adopted;

- Preparation of latrine construction manual for use by Health Assistants and extension workers outside of the Ministry of Health;

- Health Assistants work through existing women's committees, development committees, and health committees, or form sanitation committees through which to organize and train communities. The national policy and strategy for development of the sector calls for creation of joint water supply and sanitation

committees which will help link latrine construction and health education with water supplies and strengthen the committee involvement with latrines;

- Institution of charges of E5 for slab materials and E5 for vent pipes to reduce the financial burden on Government and increase the sense of value to the user.

In the last analysis, it is the impact of activities under the project which are a measure of what has been accomplished. Latrine construction with motivation and assistance of the Health Inspectorate has in fact increased substantially, as has protection of springs:

	Latrines		Spring Protection	
Year	Completed	Under Construction	Completed	Under Construction
1979	146	106	5	6
1980	289	105	7	5
1981	409	204	4	2
1982	520	780	7	19
1983	609	524	17	19
1984	649	534	21	11
1985	862	641	16	15
1986	(883)*			

* January - September

The increased level of output can be attributed at least in part to changes in administrative procedures. But it is certainly also the result of use of project funds for purchase of materials. Availability of materials is a constraint to productivity. Purchasing procedures impose constraints on spending of Government funds, and their utilization is poor (lack of adequate accounting procedures makes it difficult to assess level of spending). Use of project funds makes it possible to circumvent these constraints, making materials more readily

available in the field. This has meant that materials were available which otherwise would not have been purchased. Contributions of materials from the project were as follows:

Year	Cement (bags, 1 per slab)	Reinforcement (rods, 2 per slab)	Pitch Fibre Pipes (1 per latrine)
1982	1,200	200	560
1983	-	-	-
1984	920	1,800	200
1985	600	1,200	1,500
1986	1,150	2,300	1,050

Continued support and improved purchasing procedures are required by the Health Inspectorate. However, linkage of latrine construction with development of water supplies and logistic support from the RWSB can be expected to result in continued increase in production. It is expected that production will increase to 3,000 per year in 1987-1988.

It is not possible to assess the "spread effect" anticipated in the project document. However, questions were included in a homestead survey conducted in 1985 under the Mass Media for Health Practices Project to assess the status of water supply and sanitation in rural swaziland. While the selection of homesteads for the initial KAP study conducted under the project in 1981 and the MMHP evaluation were similar and both studies were conducted on Swazi Nation Land, the areas sampled were different. It cannot therefore be assumed that the samples were comparable. Furthermore, the factors causing any change cannot be assessed. Results obtained in these two surveys included the following estimates of coverage:

	KAP Study 1981	MMHP Study 1985
Homesteads with latrine	21.9%	39.4%
Proportion with slab from local materials	62.4%	33.7%

	KAP Study 1981	MMHP Study 1985
Homesteads with latrine	21.9%	39.4%
Proportion with slab from local materials	62.4%	33.7%

3.7 Constraints

There remain many constraints to meeting goals of this project element. The overwhelming constraint remains limited capacity to institute improved management practices and supervision which derives from:

- Lack of effective management procedures especially for purchasing, accounting, maintaining inventory records;

- Lack of training at all levels in supervision, planning and management;

- Lack of adequate staff at headquarters to provide adequate supervision of field staff.

The impact on the operation of the program of the Health Inspectorate is severe, and it leaves morale low. To overcome this constraint will require a level of effort not provided by the RWBDC Project and not forseen by its designers.

The assignment of a Deputy Senior Health Inspector was delayed, and his effectiveness long impeded by lack of housing in Mbabane, forcing him to commute from Piggs Peak for about a year. Furthermore, the Deputy Senior Health Inspector was frequently called upon to perform functions outside the water and sanitation program of the Health Inspectorate. The incumbent, due to unfortunate circumstances, has not been performing his duties since March, 1986.

The career structure and opportunities for training and advancement throughout the Health Inspectorate, but especially among the Health Assistants has a damaging effect on morale, and

therefore on productivity, as does lack of supervisory and logistical support. The number of Health Assistants assigned to the Health Inspectorate has decreased from 42 at the start of the project to 32 at its conclusion.

Lack of transportation facilities continually frustrates the Health Inspectorate staff both at headquarters and in the regions. As of September, 1985, only seven vehicles, including two vacuum tankers, of a total of 35 assigned to the Health Inspectorate, were in operation. Of these, two were in use by the Public Health Units in Mankayane and Siteki.

3.8 Recommendations

To meet its objectives over the next few years, and to become an effective unit able to fulfill its role in sectoral development in the long run, the Health Inspectorate needs assistance in establishing effective management procedures, and in training and supervising its field staff and a Deputy Senior Health Inspector. The following recommendations are directed at building the Health Inspectorate into a responsive unit which can meet the demands placed upon it and fulfill its responsibilities for provision of health education and assistance to communities:

- Establish and fill a post for the Deputy Senior Health Inspector;

- Request technical assistance for a period of at least two years, contingent upon filling the Deputy's post, to:
  - assist in development of effective procedures for purchasing and managing accounts,
  - assist in developing effective procedures for inventory control and management of logistics,
  - provide initial and follow-up training and assistance in supervision, management, and technical subjects,

- provide supervision and support to staff in the regions,
- train counterpart Deputy Senior Health Inspector on-the-job;
- participation in monthly regional staff meetings should be a high priority;

- Train new Health Assistants according to proposal already formulated with external technical assistance and financial support;

- Establish posts as required for new Health Assistants;

- Provide on-the-job training and follow-up in:
  - management and supervision
  - health education and community participation
  - spring protection and other technical subjects
  - purchasing.

- Establish close cooperative linkages with:
  - Health Education Centre: for follow-up training and supervisory assistance in health education and community participation at regional level (this will require establishment and filling of Regional Health Educator posts);

  - Rural Water Supply Board: for logistic support and technical assistance, linkage;

  - Bilharzia Control Unit: for follow-up in high risk communities.

- Provide for replacement of inoperable vehicles and driver training for all Health Inspectors and Health Assistants.

CHAPTER IV. HEALTH EDUCATION

4.1 Background

Health education is a high priority activity of the Ministry of Health as indicated in the National Health Policy and the Fourth Five Year Development Plan. The Rural Water Borne Disease Control (RWBDC) Project as it was initially conceived had a primary focus on health education.

4.2 Purpose

Health education is key to implementing and achieving benefits of clean water supplies and sanitation facilities. It is the job of the health educator to help people understand their relation to good health, and to realize that they can improve their health and that of their families if they have these facilities and use them properly. It is the task of the health educator to help develop a sense of the value of water and sanitation facilities so that communities will contribute to meeting their costs, so that they will develop a sense of ownership, so that they will operate, maintain and use them properly, and benefit from them. Thus, the overall purpose of the health education component of the project, central to that of the project as a whole, was to improve the water use and sanitation habits of the rural population of Swaziland.

4.3 Objectives

Specific objectives defined in the project documents included the following activities, outputs, and end of project targets:

- Construction and equipment of a health education center;
- Appointment and training of four Regional Health Educators;

- Participant training for the Director of the Health Education Centre at the master's level. This was subsequently modified to training at the bachelor's level;

- Development of an in-service training program;

- Participant training for the second Health Educator at the diploma level;

- Participant training for the graphic artist at the diploma level;

- Development of a national health education strategy based on the results of the KAP study to include:
  . health education content design,
  . communications channels and methodologies,
  . long-range training and staffing;

- Development of a national health education plan;

- Development of health education materials;

- Development of a mass media communications strategy and implementation of a mass media campaign;

- Training of influential decision makers (traditional healers) in control of diarrheal disease, including oral rehydration therapy;

- Dissemination of relevant health and water education messages to 60% of the rural population on a continuing basis;

- Development within the Health Education Centre of the capacity to assess community needs and translate the information obtained into a practical, effective health education program;

- Development within the Health Education Centre of the capacity to evaluate program content as well as communication techniques to ensure continued relevance of the program to the needs of rural people;

- Design and implementation of a second KAP study during the fifth year of the Project. This objective was deleted and replaced by the design and implemention of a formative evaluation of behavior change for use in planning health education intervention methodologies.

4.4 Project Inputs

Technical Assistance

Long Term	-	42 person months
Short Term	-	10.2 person months

Financial Assistance for

Construction of Health Education Centre
Equipment for Health Education Centre
Supplies for Health Education Centre
Production of health education materials
Salaries for interviewers

Long-term technical assistance was interrupted when the Health Education Advisor who arrived in Swaziland in February, 1981, departed in May of 1982. The Project was then without a long-term advisor in health education until February, 1983. The second advisor remained in Swaziland for two years, leaving at the conclusion of his contract at the end of January, 1985. Thus, the total level of long-term technical assistance amounted to 42 person months, six months short of that originally planned.

Long-term technical assistance was supplemented by short-term technical assistance totalling 10.2 person months. Of this, 7.1 person months were provided for training and for planning,

design, implementation, and evaluation of a mass media campaign which was given continuity by the Project Manager in Washington, the Chief-of-Party in Swaziland, and a continuity of the consultants and participants from the Ministry of Health and other contributing Ministries.

The Project also provided management support for the Mass Media for Health Practices Project within the Ministry of Health between April, 1984 and August, 1985.

4.5 Strategies

A key to realizing health benefits of water supply and sanitation are their proper operation, maintenance, and use. The Health Education component of the project was developed to assist implementing units to achieve a sense of value and ownership in communities, and thereby to encourage them to assume responsibility for operation and minor maintenance, and to use their facilities for their maximum benefit. This was believed to require behavioral change. Above all it was felt that health educational messages and approaches to communities must be culturally appropriate. To achieve this end, a knowledge, attitudes, and practices survey and other related surveys and evaluations were implemented to provide the basic background information required. The following strategies were adopted for providing support to implementing units and assuring their optimal acceptability and effectiveness:

- strengthening the capacity of the Health Education Centre to provide support to implementing units by

  . expanding the staff of the Centre to provide regional support to implementing units.

  . provision of training in the United States and on-the-job.

. strengthening organization of the Centre and its planning and evaluation activities.

- training of field extension workers and trainers in health education content and methods and in community participation techniques based upon information from the KAP survey and other evaluations.

- development and distribution of pretested supporting health education materials based upon information from the KAP and other surveys and evaluations.

- development of a supporting mass media campaign based upon information from the KAP and other surveys and evaluations, taking advantage of the wide distribution of radios and the uniformity of language, and implemented in coordination with promotion by field extension workers.

- explore scope for coordination with traditional healers to promote preventive health practices and carry out dialogue and training activities with them.

4.6 Accomplishments

The Project, in spite of constraints which have frustrated the ability of the staff of the Health Education Centre to serve fully the needs of the water supply and sanitation sector, and thus limited its effectiveness, has been able to provide a respectable level of support for sectoral development. In the process, it has had a major influence on the use of mass communications in support of health projects in particular, and development projects in general, in Swaziland. The sad part is that development of the capacity for planning, implementing, and evaluating mass media support for health projects was developed largely outside of the Health Education Centre itself.

Construction of the Centre was completed shortly after the project staff began to arrive in Swaziland, and the unit moved into its new home in March, 1981. Equipment needs were assessed early in the project. However, a decision was made to postpone final approval until the Assistant Graphic Artist returned from training and could identify her specific requirements. The list of equipment was revised and submitted to U.S.AID in April, 1984. An additional request for darkroom equipment was made in September, 1984. Approval for purchase of all equipment was received in January, 1985. All equipment was purchased and resides at the Centre.

In addition, the Project provided supplies to the Health Education Centre on a quarterly basis from the end of 1984 until September, 1986.

Staffing of the Health Education Centre and the role of the Health Education Advisor under the Project did not develop as originally expected. One reason was that the Health Education Advisor under WHO was not transferred as anticipated, leaving two advisors with similar responsibilities serving the Centre. The Project Health Educator ultimately became responsible for activities related to the water supply and sanitation sector. While he continued as a source of expertise within the Centre, his role was limited, and the benefits of his presence were not fully realized. He did, however, as a member of the health education staff, participate in the activities of the Centre and have an impact on planning and program implementation.

A scheme of service was formulated by the staff of the Centre with participation of the WHO and Project Advisors. This scheme of service included an organizational structure and career ladder consisting of four grade levels, job descriptions, and a schedule for filling of positions. Positions called for under the project were included.

Participant training was provided for the Senior Health Education Officer and for the Assistant Graphic Artist:

- The Senior Health Education Officer was in training in the United States from September, 1982 through August, 1984. She received a B.Sc. degree in health education from the University of Southern Illinois after having spent one year at San José State University;

- The Assistant Graphic Artist with the Health Education Centre was in training in Visual Communications at Indiana University from January, 1983 through the end of that year. She received a certificate in visual communications.

Diploma level training for a second health educator was not provided under the Project as there was no need. One Health Educator received a diploma in Health Education in 1982 from the University of Ibadan with support from WHO, and all other staff of the Centre already were qualified at least at the diploma level.

Training needs of extension workers were surveyed. Sixteen training modules were written for trainers of extension workers, pre-tested with RHMs, and printed in cooperation with DEMS. These modules covered basic education methods, community education methods, community mobilization methods, and work management skills. A workshop was conducted for trainers of extension workers in December, 1984. Twenty people from the Ministries of Health and Agriculture, Sebenta, Red Cross, Family Life Association, and Central Cooperatives Union participated in this workshop. Workshops for extension workers were conducted using the manuals as follows:

- 60 RHMs, one day on solving water and sanitation problems (May, 1984);

- 120 extension workers, four 4-day workshops (June - July, 1984);

- 73 RHMs, one 5-day workshop (July, 1984).

Further training on ORT for Health Assistants, Domestic Science Demonstrators, and RHMs was conducted with assistance of the MMHP Project.

On-the-job training provided under the Project to regular staff of the Centre was limited. To a large extent, this was a result of uncertainties as to the position occupied by the Health Education Advisor under the Project. As Health Educator responsible for activities in the water supply and sanitation sector, he was not in the position of counterpart to anyone. The staff of the Centre could not take full advantage of him as a resource, largely as a result of the pressure of ongoing activities. The advisor was never in a position from which he could help effectively to prioritize activities and to provide in-service training in key areas such as program planning, evaluation, participatory methods of training, and mass communications. He was able to suggest opportunities to improve skills.

While on the one hand, positions for Regional Health Educators were never established during the tenure of the Health Education Advisor in Swaziland, two Assistant Health Educators, one with nursing training, the other with health inspection training were recruited to fulfill needs under the MMHP Project. The Health Education Advisor provided three months of intensive training prior to the assignment of these individuals to the Public Health Unit where they have been involved in training and in implementation and evaluation of campaigns in support of oral rehydration and immunization (see discussion of Mass Media for Health Practices Project below).

Positions have been established for a Senior Health Education Officer, four Regional Health Education Officers, and four Assistant Health Education Officers. The Senior Health Education Officer's post is filled, as are three Regional Health Educator's posts, two with community health educators and one

with a nutritionist. All staff are presently located in Mbabane, but have regional responsibilities. Two health educators, one with Health Inspector training and one with nursing training, who have received on-the-job training and experience in health education, training, design of campaigns, survey design and evaluation, and who will receive participant training in health education will eventually be appointed to Assistant Health Educator posts and will be an important resource to the Centre. The Regional Health Educators will have to be assigned in the Regions, and the headquarters staff expanded if the Centre is to meet fully the demands placed upon it and at the same time provide support to Health Assistants and other health officers in the field.

A health education strategy was drafted which proposed strengthening of the Health Education Centre, training of staff and extension workers, and implementation of activities and programs to accomplish goals of health education including community involvement, involvement of traditional leaders, traditional healers and community development committees, and development of school health programs. This strategy was utilized to guide development of sectoral health education programs.

Guidelines were prepared for the strengthening of the Health Education Centre. These included recommendations for determining needs, assessing resources, formulating objectives and programs allocating resources, coordinating health education and training activities, and evaluating impacts. These procedures had not been implemented at the time the Health Education Advisor departed Swaziland.

Planning within the Health Education Centre takes place on a long-range basis in the form of five year plans and on a yearly basis. The five year plan for the period 1983-1984 through 1987-1988 was prepared during the period when there was no Health Education Advisor under the Project, although the Social Science Advisor under the Project, as a member of the Health Education Centre staff, was a participant in the preparation of this plan.

Preparation of the five year plan also preceded drafting of a national health education strategy. As a result, the full resources of the project were not available during this planning process. Later, recommendations were made for strengthening of the plan. As a result, procedures have been introduced for strengthening of the planning process which include:

- Annual meetings of Centre staff with other units of the Ministry of Health to identify needs for health education support and workshops;

- Writing of objectives for workshops;

- Evaluation of workshops.

While revision of the existing five year plan was not considered appropriate, recommendations may be considered during preparation of the next five year plan. These include:

- Identification of local community needs and their incorporation along with recommendations of special studies and evaluations;

- Formulation of specific program objectives to meet identified needs of the Ministry of Health and other agencies, organizations, and communities. This should be done in coordination with national sectoral planning;

- Establishment of priorities and evaluation needs, i.e., training programs, health education materials, radio programs, school health activities, community involvement, linkage with other sectoral development activities.

- Assessment of manpower requirements for implementation of proposed programs.

Workplans are prepared yearly by the Health Education Centre. While the Health Education Advisor was assigned specifically to provide support for the water supply and sanitation sector, yearly workplans included activities called for under the project, and it was possible to carry these out. Without this support, and without a Ministry reassessment of the needs which must be met by the Centre to implement policies and strategies set forth in the National Health Policy, it will not be possible to continue support of sectoral activities at this level as competing demands and priorities do not allow time for such concentrated attention to a single sector. Having said this, the needs of the Health Inspectorate will be taken into account in the planning of workshops, and water supply, sanitation, personal hygiene, oral rehydration, and breastfeeding will continue to be included in other health education activities of the Centre.

Health education materials have been prepared throughout the life of the Project to support sectoral development activities. These have included the following:

- Production and distribution of three posters
    - Ayihlome Maswati poster on basic environmental health practices related to the mass media campaign. This was distributed to rural clinics where it is used in connection with health education talks, (in collaboration with Health Inspectorate);
    - dangers of bottle feeding. This was distributed to clinics for use in connection with health education talks;
    - schistosomiasis, its transmission and control for distribution to schools and clinics. This will be used in the classroom by teachers and school health teams. A guide was prepared also for support of teachers discussing

schistosomiasis with pupils (Bilharzia Control Unit and Public Health Engineering with assistance from HEC);

- Production and distribution of leaflets

  - two 4-page leaflets were produced and distributed to extension workers and teachers with assistance from the Health Inspectorate and Public Health Engineering Unit. These contained basic information about the Ayihlome Maswati campaign;

  - four 1-page visual handouts were produced and distributed to clinic nurses, school teachers, extension workers, Rural Water Supply Board field staff, and rural families. The subjects covered were:

    mixing and use of ORS
    making water safe
    importance of breastfeeding
    building and using a latrine

  - Following the cyclone in 1984, 200,000 copies of the leaflets on ORS and safe water were printed and distributed. Approximately 70,000 copies were distributed to rural homesteads by health workers (with assistance from Health Inspectorate and Public Health Engineering);

- Production and distribution of a "Health Workers Manual for the Management of Acute Diarrhea in Swaziland." The HEC participated in the preparation of this manual which was produced under the Mass Media for Health Practices Project. This was distributed to health workers and used in training under that Project;

- Drafting of a learning module and workbook for use during the second phase of SEBENTA adult literacy training in rural areas. This module covered causes of diarrhea, its seriousness, mixing of ORS, and preventive measures that can be taken in the home. This module and workbook were printed by SEBENTA and pretested in the field. The printed books have been reviewed by the HEC and the Health Inspectorate and the revisions returned to SEBENTA for inclusion in the final printing;

- Preparation of a "Rural Health Manual." This was prepared with assistance of a health education consultant with support from U.S.AID. It was prepared with close collaboration of the HEC, Public Health Unit, and other agencies and organizations. Manual preparation was coordinated by the Public Health Unit. The manual is presently used during the training of RHMs and is retained by them as a later reference in their work;

- Preparation of a "Manual on Latrine Construction." This manual has been produced in the Public Health Engineering Unit by the Health Inspector/PHE for use by extension and other field workers. It will also be distributed to Health Assistants;

- Preparation of materials on environmental diseases and their control for inclusion in the science curriculum for primary schools. This material was prepared by the Public Health Engineering Unit in collaboration with the Curriculum Unit in the Ministry of Education. These materials are included in the primary curriculum presently used in all primary schools in Swaziland.

In order to help promote and inform communities about how to disinfect water at the time of the cholera outbreak, kits including 20 litre containers and bottles of unscented Javel and

Jik were distributed for use in demonstrations at clinics and with communities. Concerns discussed commonly were toxicity, the possibilities of misuse, and the possible danger to children who might drink or otherwise harm themselves if they found and opened bottles of bleach. Education was aimed at assuring safety through proper use and storage.

Whereas the Project was without a Health Education Advisor for a period of eight months in 1982 and early 1983, significant progress was made during this period in providing support for Ministry of Health programs focusing on the prevention of water and sanitation-related diseases. This was accomplished by combining resources available through the Academy for Educational Development under a project for Facilitation of Learning and under the Mass Media for Health Practices Project, both of which were funded by U.S.AID. The Project, through its manager in Washington and its field staff, was able to develop an overall strategy for mass media support and to provide the required backup for planning, design, production, and presentation of a mass media campaign. This campaign was a success in terms of its impact in support of the goals of the water supply and sanitation program in Swaziland, in terms of its long term continuation, and in terms of its influence on subsequent activity in the sector, which included the Mass Media for Health Practices Project in support of ORT, the EPI campaign in progress, and the Development Communications Project. The Project furthermore participated directly in planning and preparation for, as well as management of, the Mass Media for Health Practices Project. Linkage with this Project further enhanced coordination of sectoral activities. It is noted, however, that the Health Education Centre itself was not able to participate fully in and benefit directly from these activities because of conflicting demands upon their time.

Implementation of mass media support for programs within the water supply and sanitation sector began with a Communications Planning Workshop which was conducted from 11-15 October, 1982. Communications support can constitute an important element in

health and other development programs. Success in providing communications support however requires collaboration of many Ministries and agencies. The purpose of the workshop was to improve development communications planning in the participating ministries and agencies and to develop collaborative communications strategies for health education.

The workshop brought together participants from the Ministries of Health, Agriculture, and Education, Swaziland Broadcasting Services, the Rural Water Supply Board, Red Cross, Family Life Association, and Hospitals outside of the Ministry of Health. Resource persons were from the various Ministries and the Academy for Educational Development.

Policy statements arising from the workshop included the following:

- The Health Education Centre will take maximum advantage of radio and other media as well as traditional communication channels to educate and motivate;

- There should be coordination and cooperation among Ministries to make best possible use of communications for development;

- Development priorities should be given priority in the communications sector;

- The Ministry of Health and other Ministries should be committed to supporting the improvement of their communications capabilities.

Recommendations arising from the workshop included the following:

- That a similar workshop on communications for development be conducted for personnel at the senior ministerial level;

- That the existing coordination structure for rural development be strengthened;

- That the Swaziland Broadcasting Services organize training seminars for Ministries with guidelines for program standards;

- That each Ministry appoint full-time trained communications/broadcasting officers;

- That a body representing training institutions and Ministries be appointed to review existing resources and programs and to identify communication training needs;

- That a career structure be developed for personnel working in communications;

- That the planning committee for the workshop be responsible for organizing the next program in communications;

- That training be provided through local training institutions, seminars, workshops, in-service training and specialized programs conducted locally and overseas.

The workshop was followed immediately by training in planning and in message design. Four radio programs were produced during this training, including two programs dealing with construction of latrines, homestead disinfection, and water use.

A second workshop lasting from February 7 to 18, 1983 was conducted to plan a mass media campaign against diarrheal diseases. Participants were from the Ministries of Health, Agriculture and Education and from the Swaziland Broadcasting Services, most of whom had attended the communications planning workshop in October and were involved in communications work in

their own Ministries. The purpose of the workshop was to establish the objectives and content of the campaign, to plan the content of radio programs, to identify required resources, and plan community involvement. Many of the participants were assigned by their Ministries to work over the next six weeks on the writing of scripts and production of radio programs.

The general purpose of the campaign was to provide support for programs aimed at reducing morbidity and mortality related to diarrheal diseases in Swaziland. Its specific objectives were to promote improved health by informing people of the benefits of preventive health care and how they could reduce diseases by:

1. Protecting and maintaining springs and wells;

2. Making unsafe water safe by boiling or disinfection where protected water supplies were not available;

3. Building, using and maintaining sanitary latrines;

4. Employing good personal hygiene practices with regard to washing hands and dishes, handling food, bathing, etc.;

5. Properly handling food and protecting them from flies;

6. Keeping households clean and disposing of rubbish in pits;

7. Breastfeeding babies and providing supplementary feeding with a cup and spoon;

8. Recognizing the symptoms of diarrhea and taking the following actions:
   (a) mix and use oral rehydration solution or use prepared packets if available;
   (b) give other liquids if ORS is not available;
   (c) continue breast feeding and normal feedings;

(d) take the baby immediately to the clinic;

9. Contacting the nearest health worker for further assistance.

During the two week workshop, plans were prepared for a series of 15 radio programs. Scripts for this series consisting of short interesting dramas of family life were written to meet the objectives. Production of all programs was completed by the end of March. A slogan and accompanying music were written and the campaign became known at Ayihlome Maswati campaign.

As programs were produced, they were pretested in rural clinics and other suitable places. Pretest questions were aimed at determining understandability, acceptability, and appropriateness of each program.

The results of the pretests were overwhelmingly positive and did not indicate any need for revision.

During March, one poster and two pamphlets were developed to support the campaign. One pamphlet was designed to inform extension workers about the purpose of the campaign and the health actions recommended. The other pamphlet was for use in primary schools so the students could bring home the same information that their parents were hearing on the radio. Both pamphlets and the poster were printed and distributed in May.

Officials of the Swaziland Broadcasting Services (SBS) previewed some of the programs and found them to be of high quality according to their broadcast standards. It was agreed that each health program would be broadcast twice a week - once on Saturday evening at 6:45 pm (just after the local news and during the dinner hour when family members were home) and once on Wednesday at 12:30 noon so that it could be used by schools in their health education program. SBS started broadcasting the programs on a regular schedule on April 30, 1983.

To support the radio programs, an information packet was prepared which contained a description of the purpose and content of the programs, the broadcast schedule, and sample copies of pamphlets for extension workers and teachers. These were sent by official memorandum from the Ministry of Health to key persons in the Ministry of Education, Agriculture and Home Affairs and the RWSB, Red Cross and Swaziland Broadcasting Service.

A system to distribute the two campaign pamphlets and poster into the hands of extension workers and teachers was established with members of the Public Health Unit's school health teams and nurse clinic supervisors.

A formative evaluation of public response to the "Ayihlome Maswati" radio programs was completed in mid-1983. More than 200 homesteads were visited in Hhohho, Lubombo, and Manzini Districts. Of 271 people interviewed, 144 said they had heard the programs, 56 said they had not, 63 said they had no radio, and eight said they had no batteries. The result was that 65% of those people with radios said they listened to the programs. Most of those who listened said other members of their families also listened. Eighty five percent of listeners interviewed said that the Saturday evening program was the one they usually listened to. More than 90% of those who listened said nothing would prevent them from doing what the programs advised them to do. In general, people liked the programs and wanted to hear more of them.

During the first two weeks of July, 1983, a third workshop was conducted for members of the original mass media committee. During this time, the committee assessed and revised the 14 radio programs originally completed using current health information and data from the formative evaluation, wrote and produced radio spots, 19 of which were completed. They also wrote and produced one new radio program on nutrition.

The Ayihlome Maswati campaign continued on regular basis until the start of the Oral Rehydration Campaign in mid-1984. The health programs on the Swazi National radio are now known as Ayihlome Maswati, and the original campaign programs are still in use along with other current material.

Several activities were initiated together with traditional leaders and traditional healers, who number one for every 100 people in Swaziland, in order to explain and work together towards achieving sectoral development goals, and health education goals in particular. In order to inform community leaders of sectoral development goals and programs and build support within this group, staff of the HEC participate in workshops for Chiefs and other influential leaders.

In order to develop cooperation with traditional healers, three exploratory one-day workshops were conducted in three different regions during 1983. These were organized in collaboration with the Swaziland Traditional Healers' Society. The purpose of these workshops was to begin a dialogue between healers and health personnel to explore ways in which cooperation might take place. At the same time, information was presented and demonstrations were held on how to mix ORS for the rehydration of dehydrated children with diarrhea.

The exploratory workshop led to the formation of a committee composed of health personnel and members of the Traditional Healers' Society. Out of this joint effort came a recommendation for five-day workshops to discuss the prevention and control of diarrheal diseases, immunisable diseases, and malaria. This proposal was approved by the Ministry of Health in March, 1984, and the first workshop was conducted in June. Agreement was reached on how healers and modern health personnel could work together in the prevention of childhood diseases, and plans were made to hold five Regional Workshops.

The first Regional Workshop was held in Hhohho Region in October, 1984. Nurses and healers functioned well together during workshops, and agreed they could do so in the practice of their professions. Healers who attended workshops met with other healers to disseminate information from the workshop, especially with regard to use of ORT, nutrition, sanitation, and hygiene, and with regard to prevention of illness in general. Most healers began to practice what had been discussed, constructing latrines, using visual aids, and instituting new hygienic practices. Furthermore, ORT was completely acceptable and widely accepted. Subsequent workshops were postponed, but were resumed in August, 1986.

A report was submitted to the Ministry of Health regarding cooperation between traditional healers and modern health personnel. Terms of reference were drafted for a committee within the Ministry to deal with matters relating to healers. A committee was appointed in January, 1985, but as a consequence of changes in personnel, this committee has since been inactive.

In summary, therefore, messages relating to water, sanitation, and health reach the rural population by a variety of routes which include:

- Radio dramas, shorts, and spots;
- Health education at clinics with supporting materials;
- Primary school curriculum;
- RHMs and other extension workers, Health Inspectors, Health Assistants, and RWSB, traditional healers, and traditional leaders;

- Sebenta adult literacy programs.

In the brief survey of radio listnership referred to already in connection with the Ayihlome Maswati campaign in mid-1983, it was found that after about four months of broadcasts, 65% of people with radios heard the programs. Results of the Mass Media Health Practices survey in May, 1985 indicated that 67.3% of the total rural population sampled have listened to the Ayihlome Maswati programs. Since 76% of the population sampled had working radios at the time of the survey, nearly 90% of the target population was being reached.

In view of the coverage by radio and the numerous other routes by which health education messages reach the rural population, it is safe to conclude that messages relating to water, sanitation, and health regularly reach at least 70% of the population.

Evaluations were carried out in conjunction with many activities related to the Project. These included:

- Community water supply and sanitation (HEC, BCU, PHE);
- Utilization of water tanks during cholera outbreak (HEC);
- Effect of salinity on water use (PHE);
- Utilization of wash-houses (PHE);
- Radio listenership (HEC, PHU);
- Pre-testing of training modules for trainers (HEC, DEMS);
- Learning module for SEBENTA adult literacy courses (SEBENTA);

- Rural Health Manual (PHU);

- Control of schistosomiasis using Praziquantel (BCU, PHE);

- Use of household bleach for disinfection (PHE, HI).

Whereas guidelines were drafted for strengthening the HEC which included assessment of health education programs, needs, and program development, in practice the demands upon the Centre for training of Ministry staff and lack of Regional health educators preclude allotment of substantial time to these activities and regular staff of the HEC have not been able to become fully involved in evaluations. Training in evaluation was part of the participant training of the Senior Health Education Officer and is felt by her to be a very important part of her responsibility. However, neither she nor the other staff of the Centre have been able to conduct evaluations due to competing demands on their time.

It has not been possible to assess the impact of the attack on disease related to water and sanitation in rural areas or the Rural Water Borne Disease Control Project on either the incidence or prevalence of these diseases or behaviors which might affect them. Given the long life of the Project, the complexity of factors which may influence practices related to water, sanitation, and hygiene in rural areas, and the lack of internal control, it has not been possible to draw conclusions regarding specific causes of change. Furthermore, many of the inputs provided by the project were necessarily institutional, and can be measured only in terms of their impacts on the ability to deliver services or on the quality of those services.

It is for this reason that it was decided, on the advice of a consultant employed to recommend procedures for carrying out a final evaluation of behavior change, to incorporate questions relating to water and sanitation, their use, and behavior related

to their use into the evaluation survey conducted in connection with the MMHP Project in May, 1985. Of special interest in the context of this section are responses to the following questions:

1.	Do you improve water after collection	24.4% Yes
2.	How do you improve water	64.8% Boiling 26.7% Jik/Javel
3.	Does homestead have a latrine	39.4% Yes
4.	Motivation for having latrine	
	Privacy	16.0%
	Avoid disease	16.4%
	Radio	3.4%
	Health Assistant	4.1%
	Rural Health Motivator	9.7%
	Family member	42.9%
	Chief or Indvuna	2.2%
	Nurse	1.5%
	Agriculture Officer	1.5%
	Zenzele	0.7%

The questions indicate behaviors, understanding, and sources of information that are pertinent. The question relating to improvement of water suggests, as has been shown in previous surveys of the use of household bleach (Jik or Javel) for disinfection of drinking water (confirmed by determination of residual chlorine that behavior is influenced by health education messages. The level of understanding of how this can be done (91.5% of respondants were able to state how to make water safe in the home) indicates that health education messages are heard.

The high percentage of homesteads with latrines (39.4%), 60% with concrete slabs, likewise suggests an impact. The source of motivation is not clear, as two types of responses are recorded, one of which indicates the source of motivation and the other a rationale, i.e. avoidance of disease or privacy. This does not indicate source of information about disease. Nor does "family member" indicate whether some health education source was influential in the decision-making process. Thus the survey did not always indicate the source of knowledge relating to water,

sanitation, and personal hygiene. What is clear from observation as well as the survey, is that RHMs, who are members of communities, can be very influential motivational forces.

4.7 Constraints

Whereas on one hand, a change in Project staff did result in a discontinuity in the long-term technical assistance component provided to the HEC, there were two primary constraints to realizing the full benefits of the Project. These were:

- Scope of activities and primary emphasis on training of personnel which severely limited the ability of Centre staff to provide support to the water supply and sanitation sector;

- Lack of Regional Health Educators called for under the Project.

Because Centre staff were heavily committed to other activities, the Health Education Advisor was assigned to provide support to the water supply and sanitation sector. No counterpart relationship was developed. Thus, whereas the Centre was able to provide support through the Project, this is not feasible on a continuous basis due to conflicting demands on staff time.

In general, this has limited the opportunity to contribute to, take advantage of, and benefit from other activities within the Ministry of Health such as the MMHP Project. One result, has been that many health education resources for the support of health programs which should be concentrated in the HEC either do not exist or have been developed within the Public Health Unit. This may change later when the two Assistant Health Educators return to the HEC. But their skills must be utilized fully when they do return. If they go into Regional Health Educator positions, they may be unable to do so unless there is clear direction from the headquarters.

While guidelines have been prepared for strengthening of the HEC and for planning, the very limited opportunity for collaboration between the Health Education Advisor and Director of the Centre severely limited the contributions the Project could have made to these activities.

Finally, the Regional Health Educators are essential to providing assistance to regional staff and follow-up to training. This is particularly important to Health Assistants who have an essential role to play in providing health education and organizing communities. It has been possible for health education staff from headquarters to attend monthly regional Health Inspectorate staff meeting only on a limited basis. This has been a serious constraint to improving health education at the community level.

It may be noted that while budgeting for material support was not a constraint during the life of the Project, it may become one when Project support is no longer available.

4.8 Recommendations

The following recommendations are made to assure health education support of development in the water supply and sanitation sector as called for in the National Water Supply and Sanitation Policy and Strategy and in the Two Year Action Plan for 1987-1988 and 1988-1989.

- Program planning and evaluation guidelines should be reviewed, adopted, and implemented by the HEC;

- The Director of the HEC should be involved in all Ministry of Health planning and decision making that impacts on the role of the Centre and the use of its resources. The role of the Centre and the effective use of its resources in support of Ministry programs should be assessed and clarified. Needs for fulfilling this role should be identified and met as far as possible;

- The HEC should adopt a strategy for support of sectoral development including:

  . orientation of Chiefs and other leaders;
  . assisting community workers, Health Assistants, Community Development Officers in providing health education in conjunction with water supplies and sanitation;
  . work with curriculum unit to incorporate health education in school curricula;
  . provide training and follow-up training and supervision, especially for Health Assistants;

- Fill remaining posts for a Regional Health Educator and Assistant Health Educators. Assign Regional Health Educators in the Regions.

- Continue Ayihlome Maswati programs on water, sanitation, and hygiene, but undertake an evaluation of these and revise and update as required.

CHAPTER V. SOCIAL SCIENCES

5.1 Background

Closely integrated with the Health Education component of the Project was a Social Sciences component. No staff trained in the social sciences or in the planning, design, and implementation of surveys to determine knowledge, attitudes, and practices or to evaluate programs were available within the Ministry of Health at the start of the project. The activities under this component were designed to provide a basis for planning and evaluation of health education activities. They were also of importance to assessing needs and behavioral patterns and to understanding community organization as they related directly to the implementation of the sanitation program of the Ministry of Health.

The Social Sciences component of the project was included for the purpose of providing specific information required for planning, implementing, and evaluating programs of the Ministry of Health. It was not the intent to institutionalize the specific activities of the Social Science advisor. Yet the need for sociological studies and evaluations has been established and the capacity enhanced, in part as a result of the activities under this component of the project and in part as a result of activities under other components of the project.

5.2 Purpose

It was the purpose under the Social Sciences component of the project to implement surveys to establish behavior, habits, attitudes, and cultural beliefs concerning hygienic practices, environmental sanitation, and health in order to incorporate these into the planning and design of health education programs and the development of health education materials.

5.3 Objectives

Specific objectives of the Social Sciences component of the project were as follows:

- implementation of a knowledge, attitudes, and practices survey to provide the information required to plan and design effective health education programs and supporting materials.

- implementation of a survey of traditional healers as health care providers to provide an information base for planning, to explore possibilities for the para-professional training of healers and for further integration between health sectors, and, finally, to suggest strategies for the positive or negative reinforcement of traditional practices.

- implementation of a visual perception study and pretesting and evaluation of health education materials. Because it was considered that a visual perception study would be of only limited value, that much of the required information was already available, and that procedures recommended by WASH were appropriate for pretest of educational materials, it was agreed by all parties that a visual perception study would not be implemented.

- other surveys and evaluations were implemented in coordination with appropriate units at the request of the Ministry of Health.

- provision of assistance to the health education staff for the design of health education materials incorporating traditional values and perceptions.

- assist in the design of water and sanitation education modules to be used for in-service training of health and other community workers for incorporation into basic education programs at both the professional and academic levels.

- assist in the identification of potential resources for the delivery of water and sanitation education in rural areas.

In addition to these objectives called for in the project documents and identified during the first year of the project, the objectives were expanded and technical assistance was extended to:

- provide assistance in the formative evaluation of the mass media campaign and in making subsequent revisions.

- initiate activities directed towards assessing and establishing closer ties between traditional healers and the Ministry of Health and for provision of limited training for healers on a pilot basis.

- assess beliefs and practices relating to diarrheal diseases and assist in the planning for a campaign promoting the use of oral rehydration therapy for the treatment of dehydration associated with acute diarrhea.

5.4 Project Inputs

Technical Assistance

Long Term - 2.5 person years.

Financial Support

- Implementation of the KAP and related surveys.

- Salaries for two trained and experienced interviewers who continued to serve the needs of the Ministry and the Project throughout the Project (December, 1981 through September, 1986)

Long term technical assistance was extended for a period of six months to accommodate an expanded scope of work necessitated by immediate needs of the Ministry of Health related to the objectives of the Project.

5.5 Strategies

The Social Science component of the Project was itself a key element in the implementation of a strategy for strengthening of of the overall rural water and sanitation program in Swaziland by providing health education based on a sound understanding of beliefs, attitudes, and cultural practices.

The need for studies implemented to provide basic data for planning and design and for evaluations which provide feedback that can be employed to improve delivery of services and achievement of health benefits has been clearly demonstrated. Under the Social Sciences component support for such studies has been provided as the need arose.

Furthermore while it was not an objective of the project to institutionalize the capacity of the Ministry of Health to plan and implement sociological surveys and evaluations, several

activities under the project, and in particular the related Mass Media for Health Practices Project, have in fact been part of a strategy to enhance this capacity:

- provision of participant training for the Senior Health Education Officer which included study design and evaluation

- provision of training and experience in study design, pretesting of materials and evaluation to two assistant health educators

- training and support of two interviewers to expand resources and enhance the capacity of the Health Education Centre to implement surveys and evaluations.

- utilizing resources of the University of Swaziland in the implementation of the initial KAP study this giving students experience in the practical aspects of their studies and involving the University in activities of the Ministry of Health.

- involving the Social Science Research Unit of the University of Swaziland in Ministry of Health surveys through contract agreements to help build collaborative linkages with this source of expertise.

5.6 Accomplishments

In general, the specific objectives under the Project were met. The studies, surveys, and evaluations specifically called for were implemented and provided the information required. And assistance was provided to the Health Education Centre and other Units in utilizing findings. Furthermore, over and above specific planned activities, additional surveys and evaluations were conducted in response to needs which were indentified during the Project.

- A country-wide survey of knowledge, attitudes and practices relating to water and sanitation was conducted in late 1981 and early 1982. The survey was conducted at 450 homesteads randomly selected in 89 census enumeration areas distributed throughout the country. To supplement survey results, parallel interviews were conducted with traditional healers and rural health motivators.

  The Survey demonstrated that the Lowveld and Lubombo Plateau regions of the country (particularly in areas outside the RDA and/or not served by RHMs) include the populations with the greatest need for water and sanitation education. Needs in these areas generally parallelled level of education in homesteads and the survey indicated that health education should focus on: the role of water and excreta in transmitting disease, the difference between safe and unsafe sources of drinking water, the health benefits of improved water supplies, the value of breastfeeding, and the safe disposal of human waste. As a direct result of information from the survey, five one-page pamphlets were designed to provide this focus. The pamphlets, along with other materials, were distributed to people in their homes, clinics, and schools. The survey also indicated that more extensive use of mass media, particularly radio, is critical to the successs of health education efforts, especially when the messages are expressed in traditional cultural idioms. The "Ayihlome Maswati" series, designed with input from this survey, was successful in conveying essential health information regularly to rural homesteads.

  It was also found that approximately 40% of latrine slabs were constructed of local materials. A policy was therefore adopted by the Ministry of Health promoting use of local materials as a way of increasing latrine

construction where materials provided through the Ministry of Health were scarce or where homesteads could not afford to purchase materials.

- At the request of the Ministry of Health, a survey was undertaken to determine the social feasibility (but not the economic cost effectiveness) of placing drinking water tanks in high-risk cholera areas with limited water resources. Although some problems did arise when access was restricted by "tank keepers" or when re-supply was irregular in areas with bad roads, on balance the survey indicated that usage was frequent, or at least regular, depending on the distance from homestead to tank. Water obtained from the tanks was used both for drinking and cooking.

- A survey was requested by the MOH to determine the effectiveness in primary schools of cholera education by the Public Health Unit's School Health Team. Based on test scores before and after the cholera education lesson, the survey concluded that the "single lesson" approach is not an effective means of conveying health information: test scores did not improve perceptibly after the team's visits. Further, transportation problems and other factors prevented the team from reaching 80 percent of the targeted schools.

- At the request of the Baphalali Red Cross, the Ministry of Health conducted an interdisciplinary (public health, epidemiological, anthropological) evaluation of a water system constructed at Ntsintsa in Hhohho District. Based on this type of evaluation, decisions can be made regarding implementation of similar projects in other areas; strategies can also be developed to improve utilization and maintenance of community water systems. The evaluating team determined, in this instance, that although the economic cost of the system is relatively high when

compared to the health benefits, improved behavior and public awareness are significant positive results. People with homesteads situated near standpipes have used the water to start vegetable gardens; non-users, usually those whose homesteads are further away, acknowledge the disadvantage of their location in relation to the water source.

- At the request of the Ministry of Health, a survey of Traditional Healers as Health Care Providers was conducted to provide an information base for government planning, to explore possibilities for the para-professional training of healers and for better integration between modern and traditional health sectors, and, finally, to suggest to the Ministry strategies for the positive or negative re-inforcement of traditional practices. Through participant-observation, key-informant interviewing, and the use of an open-ended questionnaire, a report was prepared for the Ministry of Health which indicated that opportunities exist for better cooperation with the modern health sector, particularly in the area of para-professional training for traditional healers. It was recommended that training workshops and/or seminars initiallly focus on oral rehydration therapy and that ORT packets be distributed free and on a pilot basis (see section on Health Education).

- Primarily in response to a need within the Health Inspectorate to identify improper mechanisms for organizing communities, a study was undertaken to assess the feasibility of forming sanitation committees, identify existing development committees in rural communities, identify factors which affect community involvement in development projects, and recommend how projects can be most effectively implemented with communities. The results indicated that sanitation committees were not feasible, but that

sanitation should be promoted through existing health-related committees which were identified. It was also recommended that extension workers or Health Assistants, with guidance from the Health Education Unit, conduct interview surveys before investing heavily in communities to determine the likelihood of success. A format for interviews was recommended.

- A protocol for the visual perception study was prepared in collaboration with the Primary Curriculum Unit, Ministry of Education, and the Department of Extra Mural Studies, Universy of Swaziland. It was later agreed that a visual perception study would be of only limited usefulness, that the required information was already available, and procedures recommended by WASH were appropriated for the pretesting of health education materials. It was proposed that the visual perception study not be undertaken and this was agreed to by U.S.AID.

- A formative evaluation of radio listenership and the impact of the mass media campaign was conducted to provide a basis for revising and extending radio program support for water and sanitation projects (see section of Health Education).

- An assessment was made of beliefs and practices relating to diarrheal diseases. This consisted of interviews with key-informants among traditional healers, an open ended questionnaire completed on the basis of interviews with traditional healers, and participant observation and in-depth interviews with healers. This provided information on nomenclature, causes, and treatment, referrals to clinics. It also indicated ways in which preventive measures and oral rehydration might be promoted and implemented, and

provided a basis for implementing an oral rehydration compaign under the Mass Media for Health Practices Project.

5.7 Constraints

There is a continuous need for evaluation and field surveys of knowledge, attitudes and/or practices related to water, sanitation, and health. While experience has been gained in the design, conduct, and interpretation of the results from such surveys, since no provision was made during the design of the project for institutionalization of the capacity of the Health Education Unit to provide support to the Ministry in this regard, the potential long-term benefits of the project Social Scientist were not fully reached. The Social Scientist did utilize resources of the Social Research Unit at the University College of Swaziland to implement the initial KAP survey, and he participated in discussions of how the University could serve the needs of Government. The Unit has also undertaken a survey at the Luphohlo-Ezulwini Hydro-electric Scheme under contract with the Ministry of Health.

Scarcity of trained and experienced interviewers has been a constraint to the conduct of surveys to meet the needs of the Ministry of Health.

5.8 Recommendations

Field surveys and evaluations are an important part of the planning and implementation of programs. A resource is needed to assist in planning, designing, and carrying out such activities. While on the one hand activities have been undertaken under this and other projects to build this capacity within the Health Education Centre, the staff of this Unit are hard pressed and able to do little to meet their own needs at present, let alone provide assistance to other units. This situation may be relieved somewhat when the Assistant Health Educators eventually return to the Unit. However, support staff will be required to help

implement field work. Thus, a clear need exists to create positions for two trained interviewers who have worked for five years in the Health Education Centre. This would give the Centre the capacity to carry out limited field studies and assist other units on a limited scale. A program which will meet fully the needs of the Ministry and related Units of Government will require enhanced staffing specifically for this purpose.

Specifically with regard to development within the rural water supply and sanitation sector, there is a need for both a new KAP assessment and routine evaluation. The latter must be carried on jointly by the Rural Water Supply Board and Health Inspectorate with assistance of the Health Education Centre. The former must be primarily an activity of the Health Education Centre, and will require both financial assistance and technical support.

CHAPTER VI. EPIDEMIOLOGY

6.1 Background

The Bilharzia Control Unit is administratively part of the Public Health Laboratory within which its operational budget and staff are combined with that of the larger Malaria Control Unit. The Unit has been in existence since the early 1950s, during which time its activities have stressed various aspects of bilharzia control which reflected the specific interests of the medical officers in charge of the Unit.

Early emphasis on control was directed to snail control projects. In 1972, Shell Chemical Company, and in 1973, Bayer Chemical Company, aided the Bilharzia Control Unit in field testing of molluscicides in the irrigated areas of Swaziland. In 1971-1978, a major snail control program was conducted in Manzini and the peri-urban areas surrounding the town. These projects were discontinued because they failed to demonstrate any reduction in the prevalence of schistosomiasis. At the time of these snail control efforts, there were few alternative avenues of control open to the Ministry of Health as the anti-schistosomal drugs available were very toxic and required close medical supervision.

The Bilharzia Control Unit has also conducted a number of prevalence surveys, two of which were national in scope. In 1953, Dr. Eastman-Nagle first reported finding Schistosoma mansoni in Swaziland. He then did a follow-up study which included rectal biopsy to find the extent of intestinal and urinary schistosomiasis in the country. He reported that S. mansoni was confined to irrigated areas. In 1965, Dr. Gaudlie did a National Prevalence Survey of schistosomiasis which showed that S. mansoni was then widespread throughout the Lowveld. These early surveys were conducted without provisions for treating positive cases since no adequate drugs were available for mass use.

At the start of the Rural Water Borne Disease Control Project, the Bilharzia Control Unit facilities included one poorly equipped 8x10 office/lab, warehouse facilities, and one unreliable van. Its staff consisted of one Senior Health Assistant and five Health Assistants, none of whom had received formal training in schistosomiasis control.

There had been no Senior Health Professional or Medical Officer in charge of the Bilharzia Control Unit since 1977, and the staff was left to rely on its own initiative and resources. Activities of the Unit were carried out with little attention to their significance or objectives.

Snail collections were conducted on a routine basis. Collected snails were identified as to major group and counted, but no attempt was made to organize the data into meaningful figures (such as snails per man hour or snails per square meter) or to map systematically hour or locations where various species were collected. Snails were not examined for shedding cercariae, nor were the data analyzed for type of habitat, month of year, or geophysical area. Therefore, the resources expended on snail collection were of little value in planning or setting priorities for snail control.

The principal activity of the Bilharzia Control Unit was the screening of primary school children for Schistosoma haematobium. The team had evolved an efficient system for registration of students with name, age, and sex, and for collection of urine samples which were examined at the time of collection at the school. Treatment of positive cases was done on a subsequent trip. Each positive child was weighed and the first dosage of metrifonate was administered by the team. The second and third doses were given by the teacher with specific written instructions from the Senior Health Assistant. Relations with teaching staff were excellent.

However, criteria for selection of schools and systematic planning were lacking. Data collected were never compiled, analyzed or reported. It was therefore not possible to use the data on prevalences for health planning.

There was no attempt to collect stools as no one on the team had been trained to process and examine them for eggs or intestinal parasites. Ambilhar was the drug available for treatment of S. mansoni, but the general feeling was that even in cases where it was administered, the full seven-day treatment was seldom followed because of its toxic side effects, i.e. nausea and headache.

6.2 Purpose

As the project was initially conceived, it was the purpose of the Epidemiological component to carry out a national survey 1) to define the distribution, prevalence, and intensity of intestinal and urinary schistosomiasis infections, 2) to train Health Assistants to recognize eggs of other intestinal parasites, and 3) to carry out a survey of other intestinal parasites in conjunction with the survey of intestinal schistosomiasis.

The information obtained from the survey was to provide a basis for 1) defining a control strategy, 2) identifying priority areas for provision of protected water supplies, sanitation, and health education, 3) establishing resource requirements and sources, and 4) providing a framework for further public health surveys.

The early emphasis on schistosomiasis and other intestinal parasites was later expanded to include diarrheal diseases which are of immediate importance in Swaziland. The purpose was therefore broadened to include a test of the feasiblity of field surveys to provide information required to plan a diarrheal disease control program.

6.3 Objectives

Specific objectives of the project were to:

- to conduct a survey of schistosomiasis in Swaziland.

- to use data generated by the schistosomiasis survey in setting priorities for health education, sanitation, and rural water supply programs.

- to provide training to all members of the Bilharzia Control Unit Staff during the schistosomiasis survey.

- to construct and equip new laboratory facilities for the Bilharzia Control Unit.

- to develop a sampling framework for further schistosomiasis and other public health surveys through the schistosomiasis survey.

- to expand Ministry of Health activities into communities based on priority needs indicated in the schistosomiasis survey.

- to complete a national schistosomiasis control plan. It has been agreed by the Rural Water Supply Board, Ministry of Health, Regional Health Development Officer and the Project that this would take the form of a control strategy.

- to intensify schistosomiasis control activities as indicated by the study data.

- to conduct a diarrheal disease surveillance study utilizing RHMs. Because of severe difficulties encountered in the field following the cyclone, and further difficulties in completing the programming for

data analysis, it was agreed between the Rural Water Supply Board, the Ministry of Health, the Regional Health Development Officer, and the Project, that this activity should be dropped.

- to conduct a trial to determine the effectiveness of treatment with praziquantel as a measure for the control of schistosomiasis. It was agreed between the Rural Water Supply Board, Ministry of Health, Regional Health Development Officer, and the Project that the results of this trial should be presented as part of the draft schistosomiasis control strategy.

6.4 Project Inputs

Technical Assistance

Long Term	-	48 person months
Short Term	-	1.25 person months

Financial Assistance

Construction of Laboratory Facilties
Equipment for Laboratory Facilities
Supplies for Laboratory.

Long term technical assistance was increased at the request of the Swaziland Government from 36 person months originally agreed to a total of 48 person months, which permitted increasing the scope of work to include key activities and training of a Health Inspector to take over management of the unit.

Short term technical assistance amounted to 1.25 person months on diarrheal disease surveillance.

6.5 Strategies

To achieve the purpose of the project directed at the control of environmental diseases which are important causes of morbidity and mortality in Swaziland, the following strategies were adopted:

- Construction and equipping of laboratory facilities

- Implementation of a survey of schistosomiasis and other parasitic diseases and establishment of routine surveillance and follow-up treatment on a sound basis, targeted at the population at greatest risk and including involvement of school health teams and teachers.

- Implementation of a pilot diarrheal disease survey utilizing community level extension workers.

- Implementation of a pilot test of praziquantel treatment in a high risk area for the control of schistosomiasis.

- Coordination with the Public Health Engineering Unit and the Health Inspectorate to develop and implement schistosomiasis control strategies in selected high risk areas.

- Drafting of a national schistosomiasis control strategy with the Public Health Engineering Unit and Health Inspectorate.

- Drafting of Health guidelines for planning and review of water resource development projects with the Public Health Engineering Unit and Health Inspectorate.

- Coordination with the Public Health Engineering Unit and Health Inpsectorate to implement a national schistosomiasis control strategy and review planned water resource development projects.

6.6 Accomplishments

The Bilharzia Control Unit plays dual roles within the Ministry of Health, contributing on the one hand to case identification and treatment of schistosomiasis and intestinal parasitic diseases, and on the other, to the prevention of these diseases.

Three major project activities have been directed at general strengthening of the capacity of the Unit to carry out activities required of it. These included:

- expansion and equipping of laboratory facilities and providing supplies and drugs for special evaluations, such as the use of Hemastix by School Health Teams and teachers for diagnosis of urinary schistosomasis and treatement with Praziquantel for control in high risk areas, as well as routine laboratory operations.

- training has been an integral on-going function under the project. The small size of the Bilharzia Control Unit has allowed most training to be informal on a day-by-day basis. However, the formal training of two laboratory technicians focused on the identification of parasite eggs and cysts found in stools, along with a general understanding of the life cycles of those parasites. Several weeks were spent in intense practical instruction at the microscope and both technicians reached a high level of proficiency. Field Health Assistants have been trained to collect snails in a quantified scientific manner (snails per man

hour). Specific snail identification, however, must still be done by the snail research unit of Potchefstroom University.

A newly graduated Health Inspector was assigned to the Bilharzia Control Unit in February, 1983. It was expected that she would be responsible for all control activities after the departure of the Epidemiologist. Her on-the-job training included the use of the micro-computer for recording and analysing data. However, she was transferred to the Health Inspectorate in May, 1984. Her replacement arrived in May, 1985. She was also a graduate of the Institute of Health Sciences and received a crash on-the-job courses in Bilharzia Control.

In addition, formal training was arranged outside of Swaziland on two separate occasions:

- The Senior Health Assistant and a Health Assistant attended a week-long workshop in schistosomiasis control at the National Institute of Tropical Medicine in Tzaneen, Republic of South Africa in 1981.

- The Health Inspector, Senior Health Assistant and the Epidemiologist attended a World Health Organization workshop on Schistosomiasis Control at the Blair Research Institute, Harare, Zimbabwe, in 1983. The workshop presented the current recommendations of WHO in schistosomiasis control, especially the use of quantitative filter techniques for examination of urine.

Training has been provided to all students in the health inspector course at the Institute of Health Sciences.

During the life of the project, case identification and treatment have been strengthened and new strategies implemented to expand services within the limited resources available as follows:

- case identification and treatment carried out by unit staff at schools follows a plan and has been expanded to include stool examinations. Treatment is provided for schistosomiasis and for other intestinal parasitic diseases. Furthermore, intensity of infection measured in terms of eggs counts are determined and reported.

- A collaborative project with the School Health Teams was begun in mid-1984, using chemical reagent strips to diagnose urinary schistosomiasis. The value of "dip sticks," which detect blood in urine, to diagnose schistosomal infection in the school-age children was confirmed at the Bilharzia Control Laboratory following similar studies throughout Africa during the last two years.

  This diagnostic technique requires no microscope or trained laboratory technician, and thus can be used by School Health Teams and/or school teachers to test the urine of each child and treat any child found positive, thus extending the capacity for identifying and treating cases. Nearly 20,000 students have been examined using the dipsticks and the response and acceptance by the teachers have been gratifying. Six (6) kits containing reagent strips, metrifonate, a bathroom scale, urine containers and registration forms have been assembled and distributed to the regional School Health Teams. The maintenance and replenishment of the kits remain with the Bilharzia Control Unit and all data generated are entered into the computer. It is expected that the utilization of these kits will make possible the examination of each student and treatment

of all cases identified among students in the Middleveld every other year, preventing the development of heavy infection. This will allow the Bilharzia Control Unit to concentrate its activities in the Lowveld which has a high prevalence of both urinary and intestinal schistosomiasis.

- walk-in diagnostic services for identification of parasites and ova in stools and urine and treatment are provided at the Bilharzia Control Unit.

- the laboratory provides diagnostic services to private physicians and other government agencies, including food handlers.

- The Bilharzia Control Unit has been active in Swaziland since the 1950s and it has accumulated a vast store of data on schistosomiasis since the 1950s. These data are not accessible or in a form which can be analyzed easily, however, because they are not maintained in organized files. Moreover, the Bilharzia Control Unit is still collecting valuable information, the analysis of which is crucial if rational plans and decisions are to be made concerning the control of schistosomiasis and if the assessment of the impact of the Unit's activities is to be carried out. In order to facilitate this planning and evaluation, all data collected are now being stored and processed on a computer. The system allows the data to be entered on an Epson HX-20 portable computer which provides a printed summary and saves all the data on microcassette tapes. The data are later transferred from the tapes to 5 1/4" diskettes for the Ministry of Health Sirius, where they can be edited and analyzed. The system has been designed to be used by a person with no computer experience. The software consists of a set of about 25 standardized programs which can be selected by the user. General

purpose cross tabulation tables, histograms, and user defined tables are among the options available. Once the system is fully operational, the activities of the Bilharzia Control Unit can be assessed. Furthermore, it should be noted that these data contain much information that is not directly related to schistosomiasis. Data from stool examination include the prevalence and intensity of Ascaris, hookworm, and other intestinal parasites. The records also contain information on sanitation and household water utilization.

Other activities of the Bilharzia Control Unit have been directed at evaluation of the extent of illness related to water supply and sanitation, assessment of the magnitude of the problem of disease related to the environment, and identification of high risk areas:

- A national survey of schistosomiasis was conducted between January 1982 and June 1983. The survey was divided into two parts. The first was a prevalence study which determined the current prevalence of schistosomiasis in man, its geographic distribution, the species of schistosomes involved, and the population groups at risk. Also investigated were the risk of infection attributable to irrigation and the effects on prevalence of sanitation and water supply.

  The second component considered the fresh water snails of Swaziland, their geographic distribution, population dynamics, ecological requirements and parasite infestation as determined by shedding of cercariae. The survey identified those areas of intense transmission and the months of active transmission.

Three thousand seven hundred and eleven (3,711) individuals were examined during the course of the prevalence survey. These individuals were from four separate studies, i.e., randomly-selected school children from throughout the country, a survey of adults and children living in worker compounds on Ubombo Ranches Sugar Estates, adults and children of the Lomati basin, and, finally, a small homestead-to-homestead survey of Engculwini.

Eleven (11) water sites, representative of fresh water bodies in Swaziland, were examined monthly in 1982. The malacological survey paid particular attention to species distribution and shedding of cercariae. The results of this national survey with recommendations have been published and are available from the Ministry of Health.

- A survey of intestinal parasites was carried out between January, 1982 and June, 1983 in conjuction with the schistosomiasis survey. This report with recommendations was published and is available from the Ministry of Health.

- Following consultancies of Dr. D. Barua of WHO and Dr. R. Ryder, under the project, a pilot mini-surveillance system for acute diarrheal disease in the lowveld was implemented to establish 1) the type of diarrhea found in Swaziland, either acute, cholera-like or chronic "smoldering" diarrhea with serious nutritional consequences; 2) the treatment provided to the child and how often those with diarrhea are brought to the clinic; 3) the role of traditional healers, and 4) mortality associated with diarrhea.

A formal protocol for mini-surveillance of diarrheal disease and infant and early childhood mortality for 140 homesteads in the Lowveld was prepared. Guidelines suggested in the consultant report by Dr. Ryder were employed. A questionnaire was designed with input from the Medical Services, Health Planning and Statistics, Public Health Nursing, Public Health and Epidemiology Units, Rural Health Motivators, and the Rural Water Borne Diseases Control Project. Each homestead, which had at least one less-than-five-years-old present, was visited once a week by a Rural Health Motivator (RHM). After a census of the homestead was made, the RHM completed the questionnaire by interviewing the mother. She was asked about the number of days each child under five had diarrhea, its duration and related aspects, treatment used, if any, feeding practices, births and deaths, water and sanitation use, and other questions about health care and education.

The mini-surveillance was started with training in October, and weekly visits beginning in November. There were 14 RHMs involved, selected specifically because they were literate and had an outstanding record of past performance. Completed forms were collected weekly, coded and keyed into the statistics unit computer.

Therefore, the Ministry of Health now has data on diarrheal disease morbidity, resulting from weekly visits to 140 homesteads over a 12-month period. Unfortunately, required full-time surveillance officers (Health Inspectors) and support vehicles were not available for this study. The success of the survey depended on maintaining the interest, commitment and motivation of the RHMs. In addition, the study area was inaccessible for a period of serval months following cyclone Domoina in January, 1984. The lack of close supervision made the verification of the data impossible and brought the validity of the data into question. Analysis of the data was not completed, however, in view of the difficulties encountered in obtaining valid data and in finalizing the required computer program.

While recognizing the importance of an integrated control program for schistosomiasis, chemotherapy is the single most effective method for control of the disease. It is also the only method which directly relieves those already suffering from the disease. The World Health Organization has recently decided upon a strategy for the control of schistosomiasis that consists of reduction or elimination of morbidity caused by the disease. This morbidity is due to the accumulation of eggs in the various tissues and organs of the body and is directly related to the intensity of infection.

In September 1983, praziquantel first became available in Swaziland and a field trial to evaluate the drug's effectiveness in reducing morbidity in a high risk area was initiated. For the purpose of the study, morbidity was defined by prevalence and the mean number of eggs being shed by individuals infected.

The original target of 30 schools was found to be beyond the capacity of the Bilharzia Control Unit. Currently, 10 schools are visited yearly and each child is given a stool and urine examination. All students found positive are treated with praziquantel. The intensity of infection as defined by mean egg counts, will be used to evaluate the effectiveness of targeted chemotherapy as a control measure.

The Bilharzia Control Unit is midway through the third round of this investigation. The data have been enterd on the Epson HX-20 microcassettes, but still the breakdown of the Sirius computer and problems in using the program have limited the capability for analysis of results. Analysis of results and their incorporation into a national strategy for controlling schistosomiasis is planned in early 1987.

Out of these studies have come activities directed at control of schistosomiasis and other intestinal parasites. These have included:

- drafting of guidelines for planning and review of water resource development projects. These are scheduled for completion by the Bilharzia Control Unit and Public Health Engineering Unit in 1987.

- identification of high risk areas and promotion of preventive activities in coordination with the Health Inspectorate and the Public Health Engineering Unit, including:

  . meetings with the community and initiation of a sanitation program and provision of water supply at Mpofu.

  . meetings and recommendation of control measures agreed to at Ngonini Estates.

  . advising on control measures at Ubombo Ranches.

  . identification of priority areas for drilling of test boreholes.

Further assistance was provided in coordination with the Public Health Engineering Unit and Health Inspectorate in connecton with:

- assessment of health risks at the Luphohlo Ezulwini Dam.

- preparation of a scope for regulations for the recreational use of dams.

- preparation of health education materials.

- planning of research into the usefulness of an indigenous plant as a mulluscicide and the potential for its cultivation in Swaziland (with University of Swaziland).

6.7 Constraints

The Bilharzia Control Unit, while it is a key unit which provides health data essential to establishing policies and strategies for and to measuring progress in the control of infectious and other environmental diseases, and while it plays a central role in case identification and treatment of schistosomiasis and intestinal parasites, faces constraints which limit its effectiveness. Furthermore, while many of the specific outputs of the project were achieved, these and other constraints limited the opportunity to realize maximum benefits from the Rural Water Borne Disease Control Project, particularly as they related to institutional growth.

Among the constraints limiting full realization of benefits of the project were:

- Uncertainties and changes in leadership within the Bilharzia Control Unit. Until February, 1983 leadership of the Unit was in the hands of a Senior Health Assistant who was soon to be retired. At that time a Health Inspector was designated to direct the Unit. This Health Inspector received training both on-the-job and at a WHO sponsored workshop. However, she was transferred to another position outside of the Unit after 18 months. The Unit was without a Health Inspector for nearly a year until May, 1985 when a new Director of the Unit was appointed. This severely limited the opportunity for training of the newly appointed and inexperienced Health Inspector before the

departure of the Epidemiologist upon completion of his contract in August, 1985. While the Health Inspector has had some opportunity to attend workshops, she has not had the supervision and training required to prepare her to provide leadership in planning and in developing strategies and programs.

- The Bilharzia Control Unit is reponsible to the Deputy Director of Health Services and requires supervision from him, or from an epidemiologist should such a position be established. At the same time, the Health Inspector is a part of the Health Inspectorate and must at times fulfill responsibilities within that Unit which may conflict with needs of the Bilharzia Control Unit.

- The handling of data such as that generated by the Bilharzia Control Unit require expertise in the programming and use of computers as well as techniques of data analysis. The Unit has depended for its programming needs upon assistance from outside of Swaziland. This has led to difficulties and the existing programs are not serving their intended purpose as a result.

- The success of the Bilharzia Control Unit depends upon the availability of laboratory supplies and drugs. In the past, funds budgeted have at times not been available to the Unit, partly because purchase orders have not been available at times. This has impeded the work of the Unit.

- The work of the Bilharzia Control Unit has been seriously impeded in the past because transportation has not been available at all times.

6.8 Recommendations

The most important needs of the Bilharzia Control Unit are institutional. Only when these institutional needs are met can the unit realize its full usefulness. The following recommendations are made with these needs and constraints to efficient and effective program implementation in mind.

- The Bilharzia Control Unit has functioned with little supervision and minimal coordination with other Units which are involved in planning health education, and development within the water and sanitation sector. As a result, the Unit cannot contribute fully to meeting the needs of the Ministry of Health, and information required for planning and program management is not utilized effectively. To strengthen the role of the Unit and fully and effectively utilize its resources,

  . lines of responsibility must be clearly defined, and supervision from the Deputy Director of Health Services must be stregthened. If an epidemiologist can be appointed with the Ministry of Health, the Unit should become an active resource receiving supervision from this person.

  . the director of the Unit should participate in policy and planning activities within the Ministry.

  . regular meetings should be scheduled with the Public Health Engineering Unit and the Health Inspectorate to review needs and plan joint activities to meet priority needs. Data collected by the Unit should be submitted routinely to the Public Health Engineer and Senior Health Inspector for review.

. meet with the Public Health Engineer and Senior Health Inspector to decide upon how to strengthen coordination. This should include completing a schistosomiasis control strategy and finalizing guidelines for planning, review of water resource development projects, assisting with environmental inverventions to control schistosomiasis in high risk areas, and review and participation in planning of water resources development projects.

- The Health Inspector in charge of the Bilharzia Control Unit, in addition to running the Unit with minimal supervision, is doing so without the benefit of training in epidemiology and communicable diseases and their control. To be fully effective in her job she requires formal training in these subjects and in statistics, data analysis, and data processsing. This should be followed by further on-the-job training with close supervision by the Deputy Director of Health Services or Epidemiologist.

- Periodic training of other Unit staff through workshops and on-the-job supervision.

- The assistance of the Statistics Unit is essential to assure effective handling of data. (The Statistics Unit should be given responsibility for assuring proper handling and reporting of data. The computers should be maintained in operable condition).

- Budgeting for equipment, supply, and drug needs of the Unit and timely ordering are essential to its effective operation. Required budget allocations and responsibilities for supplying the Unit should be established and implemented.

- Transportation is essential to operation of the Bilharzia Control Unit. One additional vehicle should be provided to the Unit to assure that its needs can be met in this regard.

CHAPTER VII. SECTORAL PLANNING

7.1 Background

Planning for development of the water supply and sanitation sector in Swaziland was identified early in the project as essential to successful development and achievement of national health goals. This was the case because many complimentary, mutually supporting activities of different agencies were not being coordinated, opportunities for more effective use of resources were being lost, and there was a need to obtain long term financing of capital projects, to provide for the supply of manpower to sustain the sector in the long run, to establish mechanisms for meeting the long term recurrent financial resource needs to maintain water supplies, and to achieve full potential health benefits. Sectoral planning was seen as necessary if financial needs for capital investment and supporting programs were to be understood, if effective management and coordination of sectoral development was to be achieved, and if external support of a balanced and self-sustaining sectoral development program was to be achieved.

A start at sectoral planning had been made prior to the beginning of the Rural Water Borne Disease Control Project. An analysis of capital and recurrent costs for urban and rural water supply and sanitation and a manpower assessment had been completed. Neither was comprehensive in scope, neither provided guidance for sectoral development, neither was in a form which would identify funding and technical assistance requirements in a way which donors could use to identify projects.

Other limited activities were subsequently carried out. An analysis of needs was prepared by the Rural Water Supply Board, and a policy and strategy for sectoral development were prepared by the sub-sectoral committee within the Ministry of Health. By participation from all concerned units of government was limited and each activity was limited in scope.

In 1984 a team from the Ministry of Works and the Ministry of Health which included the Senior Engineer, Rural Water Supply Board, the Senior Health Inspector, a Planning Officer in the Ministry of Works, and the Public Health Engineer participated in a review and consultation on the Zambian Decade Plan. Following this experience a revised format was developed. A working committee was formed which was constituted from all agencies active in the sector and which was responsible for drafting of a sectoral plan under the guidance of the National Action Group. In order to concentrate the efforts of this group and provide technical guidance, consultants were requested under the project.

7.2 Purpose

It was the purpose of Sectoral Planning to prepare a policy and plan which would serve as a practical guide for development in the water supply and sanitation sector in Swaziland.

7.3 Objectives

Specific objectives were defined as follows:-

- Establish a viable planning mechanism under the direction of National Action Groups (NAG) to assist that body in carrying out its responsibility for planning development within the water supply and sanitation sector. This mechanism was to involve all concerned agencies, organizations, and sectors.

- Prepare a practical plan for development of the water supply and sanitation sector which would

  . be within the technical capacity of all implementing bodies to achieve

  . be within the financial capability of the government and communities

- make the best possible use of human and financial resources to achieve optimal benefits to health

- provide clear guidelines for meeting priority needs in sectoral development

- identify clear needs for external donor support in terms of where priority needs exist and the magnitude of support required. Donors must provide support within the framework of the plan

7.4 Project Inputs

Sectoral planning became a part of the project and received substantial support from it in the form of short term technical assistance, which included

- Preparation of a workplan for the planning process (1 person month)

- Preparation of a draft national policy and strategy for sectoral development (0.8 person months)

- Presentation of a National Seminar on Water and Sanitation Policies and Strategies (0.5 person months)

- Preparation of a draft 2 year action plan (0.5 person months)

7.5 Strategies

Planning for sectoral development, so important to achieving national health and development goals, utilizing resources to the best advantage to achieve optimal benefits, establishing priorities for use of scarce resources, and for achieving orderly progress, had been attempted previously on several occasions, but with limited success. In the process, requirements for effective

planning became clear. Strategies were therefore identified to carry out sectoral planning carrying the process to a successful conclusion. These included:

- Establishment of a planning group, the Technical Subgroup, under the National Action Group to assist that body in preparing the plan and carrying out certain of its other responsibilities

- Including in the Technical Subgroup experienced and responsible persons from all concerned agencies and organizations who were in a position to make decisions

- Seeking and incorporating the views of all sectors, government, non-governmental, and private into the final policies, strategies, and plans

- Providing experienced technical support where required.

7.6 Accomplishments

A working Technical Subgroup was established under the National Action Group in August, 1985. A team of two consultants arrived in Swaziland paid for by the Project but provided through the Water and Sanitation for Health Project, to review with the Technical Subgroup how sectoral planning could be effectively carried out in Swaziland and to assist in the preparation of a workplan. A workplan was developed which included the following major activities:

- Drafting of background materials on responsible agencies and organizations, needs, policies, and strategies for sectoral development. Technical Subgroup (October-December, 1985);

- Review and revision of the statement of needs, policies, and strategies. Technical Subgroup with the assistance of consultants under the project and the WASH Project (January, 1986).

- Preparation of a policy analysis including implications Technical Subgroup (March-May, 1986);

- Preparation for a National Seminar to inform concerned officials and organizations outside of government of the policies and strategies and to elicit recommendations. Technical Subgroup (March-May, 1986);

- Presentation of the National Seminar. Technical Subgroup with assistance of a consultant under the Project and the WASH Project (April, 1986);

- Revision of the statement of need, policies, and strategies based upon recommendations arising out of the National Seminar. Technical Subgroup (June-April-May, 1986);

- Approval of national policy. Cabinet (May, 1986);

- Preparation of a two year action plan for sectoral development based upon the national policy and strategy. Technical Subgroup with the assistance of a consultant under the Project and WASH Project (May, 1986);

- Approval of two year action plan. National Action Group (June, 1986);

- Approval of two year action plan. Cabinet (July, 1986);

- Review of two year action plan with donors and request for assistance. National Action Group (August, 1986);

- Preparation of five year master plan. Technical Subgroup with assistance of consultants (September-November, 1986).

The demanding timeframe contained in the workplan was established to meet budgeting and planning deadlines of government. The timing of the preparation of a two year action plan was established to assure its completion prior to budgeting for the 1987-1988 fiscal year scheduled to begin at the end of July, 1986. That for preparation of the five year master plan to precede the call for submissions to the Fifth Five Year National Development Plan to cover the period 1988-1989 through 1992-1993.

In the event, the Technical Subgroup has proved itself a very effective planning mechanism. Made up of senior operational officers, it has the benefit of a technically and administratively experienced membership which has access to information and is able to make decisions.

The Technical Subgroup has been able to adhere very closely to its tight work schedule and to devote the time required to fulfill all of its responsibilities. A detailed strategy document was prepared on schedule. The final draft was prepared with assistance of consultants in February. The Seminar was delayed until June as a result of the coronation of the King. The draft policy document was revised in June and early July. It has not been possible to submit the plan to Cabinet for approval at this time; however, a first draft of the two year action plan was prepared with assistance of a consultant in July, ahead of the start of the next budgeting cycle. Revisions were made through September, 1986. This plan will be used by involved agencies in preparing their budget submissions.

Preparation of the five year master plan has been included in the two year action plan, but it has been postponed until the 1988-1989 fiscal year to permit evaluation of progress during implementation of the two year action plan as part of the planning process.

The policy and strategy document provides clear guidance for planning and implementing sectoral development. It establishes the commitment of the Swaziland Government to national goals, and to 5 year targets for coverage. It provides safeguards against the construction of water systems which are likely to fail, and it links water supply, sanitation, and health education. It also calls for rehabilitation and maintenance of failed or inadequate systems. Major concerns addressed in the policy document include:

- Coverage
- Community participation
- Linkage
- Coordination
- Standards of design, construction, and performance (water quality)
- Maintenance
- Manpower development
- Funding
- Institutional strengthening

The two year action plan was developed wholly within guidelines established by the policy and strategy document. The plan for the rural subsector includes nineteen program elements, eleven of which require external funding and technical support. Two of these program elements are for construction of new water systems and rehabilitation of inoperable systems. The extent of capital investment was determined by the capacity of existing institutions to implement projects, and does not represent an increase in the level of activity, except that renovation of failed systems with provision for continued maintenance is a new activity with special problems of community involvement.

The plan for construction of latrines calls for a substantial increase in capital funding, and an increase in productivity from approximately 1000 latrines completed with assistance of the Health Inspectorate in 1986 to 3,000 during each of the plan years. This will be made possible by linking latrine construction to construction of water supplies and by coordination between the Ministry of Health and Rural Water

Supply Board. Further development of the capacity of the Health Inspectorate to fulfill its responsibilities provided under other planning elements which call for staffing, training, and technical assistance.

Maintenance of water supplies is a major planning element which calls for expansion of facilities and staffing to meet expanding needs. Recurrent costs of maintenance will increase and mechanisms are being developed to finance upkeep of rural water systems placing increasing responsibility on communities.

Manpower development is seen as a constraint to development and continued progress throughout the sector. The plan calls for an assessment of manpower needs and resources, institutional resources for training, and planning for development of the capacity to meet manpower needs.

Other planning elements describe support programs required to implement and sustain capital investment projects and to achieve the standards of planning, design, construction, health education, performance, operation, maintenance, community participation, and utilization required to meet national objectives.

Finally, the plan calls for preparation of a five year master plan which will draw heavily upon experience gained during implementation of the two year action plan.

7.7 Recommendations

The institutional base for sectoral planning has become well established. The Senior Engineer of the Rural Water Board serves as the Secretary to the National Action Group and Chairman of the Technical Subgroup. The Ministry of Natural Resources is very supportive.

Strong leadership from the National Action Group with support of the Department of Economic Planning will be required to obtain Cabinet approval of the National Policy and Plan and to obtain financial support for the different project elements.

The momentum of the planning process will have to be maintained if future master planning is to be successful. This must be maintained through provision of a clear scope of work for the Technical Subgroup and regular meetings.

CHAPTER VIII. LINKAGE AND COORDINATION

8.1 Background

Essential to the achievement of the benefits of sectoral development is linkage of services and coordination among agencies and organizations. It was therefore central to the success of the project in meeting its goals and a key to its ability to respond to needs. The establishment of common goals to serve all agencies, units, and organizations, and of mechanisms to coordinate efforts of each to make the most effective use of resources has therefore been emphasized throughout the life of the Project.

Linkage and coordination are of overriding importance to achievement of health benefits of sectoral development. Provision of water alone without sanitation of the environment with which children are in contact, not properly used for personal hygiene, and not used for household purposes such as bathing and washing of clothes, and thus not reducing contact with surface waters, can have only limited beneficial impact on health. Similarly, sanitation without provision of safe water and its proper use can have little beneficial impact. Achievement of benefits demands linkage of safe water and sanitary facilities, an understanding of why and how to use them, and often treatment to eliminate the reservoirs of infection.

To optimize benefits of limited resources, facilities and health education must be placed where they are needed most. Priorities must be established. This requires recognition of areas of need and coordination of epidemiologic services with implementing agencies and health education. Successful implementation and effective use of resources also require close coordination to obtain assurance that communities contribute to the initial investment in projects and that they continue to use them properly and effectively, to operate them properly, and to maintain them. To accomplish this requires that communities be

fully involved during the earliest planning to assure that the systems meet their needs as they see them, that they understand the importance of both their water supply and sanitation facilities, that they understand what is necessary to operate and maintain them, that they understand and develop a sense of the value of their facilities and of ownership, and that they understand their own responsibilities to operate and maintain them. Some agencies also are severely constrained by limited transport which can be made available from other agencies when activities are linked.

Finally, there exist many water systems in Swaziland which have never functioned or which have failed after a short period of use. This has been a result not only of failure of the community to carry out its responsibilities but a failure of the design and construction to meet a satisfactory standard and a failure to provide for major maintenance. When this happens both communities and donors of funds are cheated, and the communities lose faith in development projects. Technical assistance available from agencies experienced in development of rural water supplies is available to help avoid such failures.

8.2 Purpose

It was the purpose of linkage and coordination to maximize benefits of development within the water supply and sanitation sector and to optimize the use of the limited resources available by linking as far as possible health education, sanitation, and provision of safe water.

8.3 Objectives

Specific objectives were to:

- Institute procedures for linking water supply sanitation, and health education

- Demonstrate the advantages and value of coordination and linkage

- Achieve linkage on individual projects funded under the Rural Water Borne Disease Control Project

- Recommended specific strategies for strengthening coordination and linkage

8.4 Project Inputs

Project inputs were provided under existing project elements.

8.5 Strategies

Coordination and linkage of various inputs into sectoral development was promoted among the various concerned units of government and between government and non-governmental organization through:

- Coordination meetings designed to clarify needs and responsibilities, and to build mutual confidence

- Provision of guidelines and procedures for implementation of cooperative projects

- Linking financial support for projects

- Provision of mutual support for implementing units in the regions

- Planning for increased support for coordination, involving field staff as much as possible

8.6 Accomplishments

Specific needs and opportunities to meet these needs through collaboration are easily identified and strongly felt. As a result linkage and collaboration have received strong support from the Ministries of Health and Natural Resources, and collaborative ties are being extended. Strengthening of linkage and collaboration have become a matter of national policy, and they have been included in the two year action plan for sectoral development. Progress to date in achieving the objectives of linkage and collaboration is as follows:

- Small spring protections constructed in the past by the Health Inspectorate and some non-governmental organizations have not been well conceived and have not met acceptable standards of design and construction. This has resulted in poor quality water, inconvenience to users, failure, and poor use. The Rural Water Supply Board has provided training for Health Inspectors, Health Assistants, and others in planning, designing, and constructing small spring protections, as well as technical assistance during all phases of spring protection, and assistance in establishing sound procedures.

- The community development staff of the Rural Water Supply Board is limited and is centrally located at Regional construction yards. Health Assistants who are located in communities and are more a part of them can assist in providing health education, assuring that communities understand their responsibilities, and organizing them to participate in the initial planning, implementing, and later operation and maintenance of facilities. In some communities where operation and maintenance require more attention as where chlorinators or slow sand filters must be maintained, Health Inspectors and Health Assistants can take on

this responsibility. This has been agreed to by the Rural Water Supply Board and Ministry of Health, but is just beginning to take place in communities.

- The ability of the Health Inspectorate to implement latrine construction is in many areas severely limited by lack of transport. This affects the ability of Health Assistants to reach project areas as well as their ability to bring construction materials to these areas. By linking health education and sanitation with water supply projects, the Rural Water Supply Board can assist in providing transportation to Health Assistants and carrying materials to communities. This has worked notably well in Lubombo Region, but remains to be implemented in other areas. The Rural Water Supply Board has expressed its willingness to assist in transporting materials to the Regions as well, and has begun to provide this assistance to the Health Inspectorate.

- The Clerk of Works and Microtechnician in Shiselweni Region, and to a limited extent the Community Development Officer in Manzini Region, have participated in monthly meetings of the Health Inspectorate in order that each agency can keep informed of problems and needs of the other and so that they could coordinate their activities. This practice worked well but was dropped following personnel changes. It is being resumed however, in all Regions.

- Health Assistants require constant help, follow-up training and supervision to improve the delivery of effective health education and the provision of assistance to communities to improve their participation. The Health Education Centre can provide this support for the Health Inspectorate, but only if their staff is augmented at Regional level. The

establishment and filling of posts for regional health educators was called for under the Rural Water Borne Disease Control Project, but has not taken place.

- A water and sanitation subcommittee was established by the Ministry of Health in 1982. This subcommittee which included members of all involved units within the Ministry of Health, the Rural Water Supply Board, Ministry of Agriculture, and Ministry of Education, met on a monthly basis, and was very effective in establishing policy; preparing and approving guidelines; informing members of activities of mutual concern, and coordinating activities. This committee has not met since October, 1984, but the Technical Subgroup has recommended that it begin to meet again on a bimonthly basis.

- The Technical Subgroup of the National Action Group includes representatives from the operational level from all units of government and non-governmental organizations and meets routinely on a monthly basis and more often when required. This group was established in August, 1985 and has become an effective body which can be useful in promoting and effecting collaboration.

- The Bilharzia Control Unit is an important source of information which is required to establish high risk areas where water supply, sanitation, and health education are required in coordination with treatment to reduce morbidity. The Bilharzia Control Unit, Health Inspectorate, and Public Health Engineering Unit have met with estates and communities in high risk areas to recommend and assist in implementing control measures. In addition, based upon recommendations of the Bilharzia Control Unit, priorities have been established for well drilling and construction of water supplies. The Bilharzia Control Unit has also assisted

the Public Health Engineering Unit and Health Inspectorate in conducting surveys at dams. Joint review and participation in planning and design of dams will be extended in future.

8.7 Recommendations

Linkage and coordination have been discussed by the Technical Subgroup of the National Action Group, by Clerks of Works, Community Development Officers, and Health Inspectors in several joint meetings, and by government, private, and non-governmental organizations at a National Seminar on Policies and Strategies for Development of the Water Supply and Sanitation Sector. Out of these discussions has come agreement on the following mechanisms for achieving the linkage and coordination required by the National Policy:

- Regular meetings of the TSG on a bi-monthly basis, with participation of all concerned agencies and non-governmental organizations. Review of progress, future planning, and identification of needs will take place.

- Participation of the Rural Water Supply Board Clerks of Works and Community Development Officers and non-governmental organizations in regional Health Management Team meetings to assure awareness of sectoral projects, needs, and coordination of activities.

- Participation of Rural Water Supply Board Clerks of Works and Community Development Officers and of Health Inspectors on Regional Development Teams to assure awareness of sectoral projects, needs, and coordination of activities.

- Participation of Rural Water Supply Board Clerks of Works and Community Development Officers in monthly regional meetings of Health Inspectorate to assure

local level awareness of problems of linkage, needs for community participation and assistance. NGOs will also participate in these meetings in regions where they have projects.

- Participation of all implementing agencies in sectoral meetings to be called by the RWSB at six month intervals to review plans and activities, problems, and how to improve coordination, and linkage.

- Assignment of a Health Inspector to the Public Health Engineering Unit to assist in carrying out the responsibilities of the PHE and liaise between the Ministry of Health and the RWSB.

In addition to the above, regular joint meetings of the Public Health Engineer with the Bilharzia Control Unit and Health Inspectorate are required to assure responsive follow-up to needs identified by the Bilharzia Control Unit and effective participation in and review of proposed water resource development projects.

CHAPTER IX. CONSTRUCTION OF WATER SUPPLIES

9.1 Background

In late 1985 it was anticipated that project funds would be available which could be used for construction of water supplies. Funds used in this way could serve to meet immediate needs of rural communities and the Rural Water Supply Board whose funding did not meet its capacity to implement capital projects. At the same time this use of funds could fulfill specific objectives of the Project.

9.2 Purpose

A proposal was drafted for the construction of eight water supplies to serve 9,490 people at a total cost of E463,335, E343,958 of which was provided under the Rural Water Borne Disease Control Project. This activity constituted a demonstration of achievements of the Project for it called for coordination of the elements which had received support and which were emphasized in the National Policy for Development of Water Supply and Sanitation in Swaziland. Implementation of water schemes was to be carried out through the Rural Water Supply Board. The Health Inspectorate was to provide health education, help target communities with latrine construction, and assist in organization of community participation. The coordinative linkage was important to:

(i) Increasing community understanding of health problems and how clean water and sanitation can help improve health.

(ii) Developing effective organization for involving the communities in planning, construction, operation, and maintenance of water systems.

Participation of Health Assistants was good in some target communities, but the objectives of linked health education and latrine construction were not met in others. To address this problem, the concerned Clerks of Works and Community Development Officers from the Rural Water Supply Board and Health Inspectors from the Ministry of Health were called together to agree on how they could improve coordination during the remainder of the Project and in the future. It was agreed that:

- Clerks of Works and Community Development Officers will keep Health Inspectors and Health Assistants informed of new projects and needs where schemes are in progress. They will also assist in providing transportation.

- Clerks of Works or Community Development Officers will attend monthly meetings of the Health Inspectorate so that each can inform the other of activities, discuss problems, and agree on logistic and other arrangements to assure linkages and mutual assistance.

While on the one hand, all objectives of this activity were not fully met, it did serve as a test of how coordination was being achieved, and it served as an important step towards its future implementation. It was therefore an important demonstration of a process which both the Rural Water Supply Board and the Health Inspectorate view as essential to meeting their respective and mutual goals. It should be noted furthermore, that coordination does routinely take place in many localities, and can be more widely achieved.

9.5 Recommendations

Future progress in development of the water supply and sanitation sector, and in meeting national goals, will depend on effective community involvement, linkage, and coordination among

implementing agencies and organizations. This will depend in turn on the persistence of responsible officers and their supervision of field personnel.

Where management and supervision need strengthening, as in the Health Inspectorate, filling of positions, technical assistance, and training are needed.

National Policy requires linkage of water supply, sanitation, and health education, and provides guidance and authority to achieve it. It also takes into consideration health priorities in allocating resources. The two year action plan includes it. Both the Swaziland Government and external donors must insist upon its being implemented.

(iii) Motivating the construction and use of latrines linked to the provision of safe water.

(iv) Motivating proper use of water for all home uses including drinking, cooking, personal hygiene, and washing clothes.

9.3 Accomplishments

The works proposed included construction of four new macro systems (two boreholes and two spring protections) and three new micro systems (one borehole with hand-pump and two small spring protections), as well as rehabilitation of an inoperable macro system.

The severe time constraints imposed, which required that all systems be completed between April and the end of September, 1986 meant that communities and implementing agencies had to work efficiently and without delay. In preparation, responsible officers from the Rural Water Supply Board and the Health Inspectorate met to establish how coordination of efforts could take place.

Participation posed unique problems in the community which was to be served by the rehabilitated system as the experience of the community had not previously been a good one. The problem of obtaining good community participation which was essential to successful implementation was severe. It was overcome by joint efforts of the chief, the Tinkhundla office, Health Assistant, Community Development Officer, and headquarters staff of the Rural Water Supply Board. Coordination has taken place well in the area of this system and two nearby small spring protections. In spite of delays in several communities, progress in the construction of water supplies was very good and all systems were completed by and providing water meeting water quality guidelines the Project Completion Date.

CHAPTER X. REVIEW OF NEEDS AND RECOMMENDATIONS

10.1 Background

During the life of the Rural Water Borne Disease Control Project, many activities directed at meeting its objectives were undertaken by diverse units of government both individually and in coordination with one another. Some of these activities were aimed at building the institutional base for sectoral planning and program implementation; others consisted of specific planning and program activities carried out in pursuit of sectoral development goals.

The most important recommendations which can be made at the conclusion of this project relate to the strengthening of the institutional base for implementing programs. The project did not have discrete physical outputs which could be identified as complete upon its conclusion. Rather, it constituted a phase in the development of the health sector with broader development objectives.

In general, these objectives were achieved. The institutional base for further development in the water and sanitation sector has been largely established, policies and strategies have been drafted, and a plan has been prepared to guide future development.

There remain however, several areas of need in which the specific objectives of the project were not fully met or which should be pursued further if sectoral development is to meet its objectives as identified in the National Policy for Development of the Water Supply and Sanitation Sector.

Many of the recommendations contained in this report are contained in the two year action plan. They are thus already an integral part of Swaziland's sectoral development scheme.

Certain program activities which were begun during the life of the project were still underway upon its completion. They are part of the on-going program of the Swaziland Government. Some of these are long term activities under the implementation program. Others are short term activities designed to provide results which will be used in planning and implementing future programs. These too are largely contained in the sectoral development plan.

10.2 Purpose

It is the purpose of this final section of this report to consolidate and provide a unified picture of the needs identified and recommendations made separately in previous sections of this report.

10.3 Institutional Development

Remaining needs for institutional strengthening and development can be considered according to catagory as follows:

1) Organizational structure and function
2) Planning
3) Authority
4) Guidelines and Strategies
5) Training
6) Staffing
7) Budgeting
8) Transportation

Organizational Structure and Function. The major need for strengthening of organizational structure and function lies in the Health Inspectorate. Here, lack of effective management procedures, lack of training in supervision, planning, and management, and lack of adequate staff at headquarters result in inadequate supervision, poor control of purchasing, inventory, and distribution of materials, and non-use of available funds for required construction materials. Although much progress has been

made in the past 5 years, limitations on supervisory and logistical support and limited opportunity for training and advancement throughout the Health Inspectorate, but especially among the Health Assistants, have had a damaging effect on morale and productivity.

To become an effective unit able to fulfill its long term role in sectoral development and to meet its objectives, the Health Inspectorate needs assistance in establishing effective management procedures. To obtain this assistance, it is recommended that the Ministry of Health request technical assistance for a period of at least two years, contingent upon establishing and filling a post for a Deputy Senior Health Inspector to:

- assist in development of effective procedures for purchasing and managing accounts

- assist in developing effective procedures for inventory control and management of logistics

- provide initial and follow-up training and assistance in supervision, management, and technical subjects

- provide supervision and support to staff in the regions

- train counterpart Deputy Senior Health Inspector on-the-job

- participate in monthly regional staff meetings

In addition to the Health Inspectorate, the Bilharzia Control Unit has functioned with little supervision and minimal coordination with other units which are involved in planning, health education, and development within the water and sanitation sector. As a result, the unit has not been able to contribute fully to meeting the needs of the Ministry of Health, and

information required for planning and program management is not utilized effectively. To strengthen the role of the Unit and fully utilize its resources, it is recommended that:

- lines of responsibility be clearly defined, and supervision from the Deputy Director of Health Services be strengthened. If an epidemiologist can be appointed within the Ministry of Health the Unit should become an active resource receiving supervision from him.

- the director of the Unit participate in policy and planning activities within the Ministry.

- regular meetings be held with the Public Health Engineering Unit and the Health Inspectorate to review needs and plan joint activities to meet priority needs. Data collected by the Unit should be submitted routinely to the Public Health Engineer and Senior Health Inspector for review.

- meet with the Public Health Engineer and Senior Health Inspector to decide upon how to strengthen coordination. This should include completing a schistosomiasis control strategy and finalizing guidelines for planning review of water resource development projects, assisting with environmental interventions to control schistosomiasis in high risk areas, and review and participation in planning of water resources development projects.

Support of the Health Education Centre is likewise essential to effective sectoral development. The following recommendations are made to assure this support as called for in the National Water Supply and Sanitation Policy and Strategy and in the Two Year Action Plan for 1987-1988 and 1988-1989.

- Program planning and evaluation guidelines should be reviewed, adopted, and implemented by the HEC;

- The Director of the Health Education Centre should be involved in all Ministry of Health planning and decision making that impacts on the role of the Centre and the effective use of its resources in support of Ministry programs should be assessed and clarified. needs for fulfilling this role should be identified and met as far as possible;

- The Health Education Centre should adopt a strategy for support of sectoral development including:

  . orientation of Chiefs and other leaders;
  . assisting community workers, Health Assistants, Community Development Officers in providing health education in conjunction with water supplies and sanitation;
  . work with Curriculum Unit to incorporate health education in school curricula;
  . provide training and follow-up training and supervision, especially for Health Assistants;

While strengthening the Health Inspectorate, Bilharzia Control Unit, and Health Education Centre is required if they are to be fully effective, all units must work together if optimal benefits of sectoral development are to be realized. The construction of safe water supplies alone can have only a limited beneficial impact on health if water is not used properly, if alternative polluted sources are used for certain purposes or when access to a safe supply is not available and if the environment of the homestead is polluted. Thus, sanitation and health education are required as well. Likewise, sanitation without safe water and health education can be of only limited value. In addition, epidemiologic information is required to identify priority high risk areas and to help guide control

activities. Without interaction with water supply and sanitation construction units, the Bilharzia Control Unit and the Health Education Centre can be only partially effective. Thus, all units must participate in the projects of all others if they are to use their resources to the best advantage.

Major efforts have been made to strengthen coordination among units of government and between government and non-governmental and private organizations. Agreement has been reached on mechanisms which should be used to achieve linkage and coordination. These include:

- Regular meetings of the Technical Subgroup on a bi-monthly basis, with participation of all concerned agencies and non-governmental organizations. Review of progress, future planning, and identification of needs will take place.

- Participation of the Rural Water Supply Board Clerks of Works and Community Development Officers and non-governmental organizations in regional Health Management Team meetings to assure awareness of sectoral projects, needs, and coordination of activities.

- Participation of Rural Water Supply Board Clerks of Works and Community Development Officers and of Health Inspectors on Regional Development Teams to assure awareness of sectoral projects, needs, and coordination of activities.

- Participation of Rural Water Supply Board Clerks of Works and Community Development Officers in monthly regional meetings of Health Inspectorate to assure local level awareness of problems of linkage, needs for

community participation and assistance. Non-governmental organizations will also participate in these meetings in regions where they have projects.

- Participation of all implementing agencies in sectoral meetings to be called by the Rural Water Supply Board at six month intervals to review plans and activities, problems, and how to improve coordination, and linkage.

- Assignment of a Health Inspector to the Public Health Engineering Unit to assist in carrying out the responsibilities of the Public Health Engineering Unit and liaise between the Ministry of Health and the Rural Water Supply Board.

In addition to the above, regular joint meetings of the Public Health Engineer with the Bilharzia Control Unit and Health Inspectorate are required to assure responsive follow-up to needs identified by the Bilharzia Control Unit and effective participation in and review of proposed water resource development projects.

Planning. Effective sectoral development depends upon the coordinated contributions of diverse units of government in pursuit of clear goals. It depends also on effective use of resources to implement priority projects. Sectoral planning involving all concerned agencies is essential if financial needs for capital investment and supporting programs are to be clearly identified, if effective management and coordination of sectoral development is to be achieved, if optimal benefits are to be realized, and if external support of a balanced and self-sustaining sectoral development program is to be achieved.

An effective mechanism for sectoral planning has been established and a national policy, strategy, and short term action plan have been drafted. While these documents already have begun to provide guidance for activity within the sector, they

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have yet to be submitted to Cabinet for approval. Furthermore, planning is a continuous process which includes constant evaluation of progress and improvement of implementation, and identification of and response to changing needs.

Leadership from the National Action Group with support of the Department of Economic Planning will be required to obtain Cabinet approval for the National Policy and Plan and to obtain financial support for the different elements of the plan. This will require activation of the National Action Group at the earliest possible time to review and approve the plan prior to its submission to Cabinet.

The short term action plan includes several planning activities essential to meeting long-term planning objectives. These include:

- Assessment of manpower needs and preparation of a manpower development plan. The plan calls for 2 person months of technical support to assist in preparation of the manpower assessment and plan

- Evaluation of project implementation and impacts

- Preparation of a five year master plan for sectoral development. The plan calls for 5 person weeks of technical support in the preparation of this plan

Authority. In order to carry out responsibilities and be effective in implementing programs, the responsibilities and authority of implementing agencies must be well established and generally recognized. While this is not a problem where water supply and sanitation are concerned, the full potential of the Public Health Engineer to serve the interests of health and environment in Swaziland is somewhat restricted because he has no recognized authority in certain areas which include the health aspects of stream pollution, solid wastes handling and disposal,

and air pollution. He also has until now not taken part in the planning and design of agricultural projects. In order to expand effectively the role of the Public Health Engineer and to realize his full potential as a resource and source of support for projects and programs impacting on health, the following recommendations are made;

- That the Public Health Engineer meet with the Director of Health Services and appropriate unit heads within the Ministry of Health to define needs vis-a-vis the Public Health Engineering Unit and to agree on how the Ministry and Public Health Engineering Unit can best meet these needs, the responsibilities of each, and procedures for meeting these responsibilities. Areas to be considered should include water and wastes, solid wastes, and water resource development activities. Following general agreement between the Ministry of Health and the Public Health Engineering Unit, a meeting should be held with other concerned Ministries to present the concerns of the Ministry of Health and to propose and agree on procedures.

- That the role of the counterpart Public Health Engineer in liaising with the Ministry of Health be strengthened with support of a long term advisor.

Other needs relate to regulations. This is of immediate concern as it relates to development of recreational resources at dams. A scope has been drafted for health regulations for the development of recreational facilities at dams. This must be completed and approved by the Ministry of Health and other concerned agencies if it is to be useful.

Strategies and Guidelines. Implementation of activities and programs which are the responsibility of health agencies and the Public Health Engineer but which interact with and impact upon the activities of other Ministries or units of Government can be

facilitated if strategies are defined and guidelines formulated which can be understood and agreed upon by all units involved. They are in certain cases required if planning agencies are to understand and accommodate health requirements from the early stages of project development. In view of this, preparation of strategies and guidelines was carried out under the Project. In several important instances, preparation of and agreement upon strategies and guidelines was not completed. The following strategies and guidelines are needed and should be completed:

- A study of the effectiveness of treatment with Praziquantel for the control of schistosomiasis was carried out to test its appropriateness a control strategy. Delays in completing field studies and analysing data prevented their use in formulating a control strategy, however, and completion of this activity was delayed. Sufficient background data should be available by the end of 1986 to prepare a draft control strategy for schistosomiasis and this should be done in early 1987 by the Bilharzia Control Unit with the Public Health Engineering Unit and the Health Inspectorate.

- In response to a request from an interministerial committee formed to guide and control development of recreational facilities on dams, a scope of health concerns was prepared by the Public Health Engineering Unit and the Ministry of Health. This was intended to serve as a framework for regulations covering development and recreational use of dams. Completion of this activity was postponed as plans for development were delayed, thus relieving the sense of urgency and priority originally expressed by the committee. These regulations should be completed by the Public Health Engineering and Bilharzia Control Units with the Health Inspectorate, however, as they will be needed.

- Health guidelines for planning and review of water resource development projects were prepared in preliminary draft form but were delayed pending completion of the schistosomiasis control strategy. These guidelines are required if health impacts are to be considered during planning of irrigation projects, dams, and other projects. They should be completed therefore by the Public Health Engineering and Bilharzia Control Units in collaboration with the Health Inspectorate.

Staffing. Whereas a close examination of staffing needs should be undertaken as part of the planned sectoral manpower assessment, certain requirements are clearly identifiable and urgent and need not await completion of the manpower assessment. Among these urgent requirements are:

- Establishment and filling of a post for a Deputy Senior Health Inspector. The job of managing the Health Inspectorate, supervising and providing support for field staff, including material, logistical, and technical support, maintaining management information systems, purchasing and distributing supplies, and training far exceeds the capacity of the Senior Health Inspector who has many duties in addition to these. If the Health Inspectorate is to carry out its functions effectively, and if it is to meet its goals, it must build an effective headquarters staff which includes a Deputy Senior Health Inspector.

- Health Assistants were last trained in the mid-1970s. The number of Health Assistants assigned to the Health Inspectorate has since dwindled to about 30, which falls far short of the number required to carry out its planned program. The number of Health Assistants required must be finally identified and the number of new Health Assistants who must be trained has to be

established. Support for the training program for new Health Assistants must then be obtained and training begun. In the meantime, additional posts must be established at the required level.

- Health Education support is needed at the Regional level. The unfilled posts for Regional Health Educators and Assistant Health Educators need to be filled and Regional Health Educators need to be assigned in the Regions.

Training. Training is a fundamental need which must be met if programs are to function well. Overall sectoral training needs should be identified in the manpower assessment recommended previously. However, specific needs closely related to the objectives of the project are readily identifiable and recommendations can be made which need not await a manpower assessment. These include:

- Participant training

  . For the Public Health Engineer: training at the master's level in public health engineering, including water supply, water chemistry, sanitary microbiology, wastewater treatment and disposal, stream analysis, solid wastes management, air pollution control, epidemiology, parasitology, and control of infections and parasitic diseases. This training should follow an additional year of training on the job.

  . For the Health Inspector, Bilharzia Control Unit: the Health Inspector in charge of the Bilharzia Control Unit, in addition to running the Unit with minimal supervision, is doing so without the benefit of training in epidemiology and communicable diseases and their control. To be

fully effective in her job she requires formal training in these subjects and in statistics, data analysis, and data processing. This should be followed by further on-the-job training with close supervision by the Deputy Director of Health Services or Epidemiologist.

The cadre of Health Assistants falls far short of needs and is continually depleted. In-country training of Health Assistants is recommended following a proposal already formulated with external technical assistance and financial support.

On-the-job training is needed in nearly all units and should be conducted on a continuous basis. Needs for on-the-job training include:

- Public Health Engineer, and Health Inspector/PHE:

  . Public Health Engineering
  . Water Quality laboratory methods and interpretation of results
  . Research and evaluation methods
  . Health impacts of resources development projects
  . Administration and supervision
  . Coordination

- Deputy Senior Health Inspector (contingent upon establishment and filling post):

  . supervision and support of field staff
  . management information systems
  . management of unit including procedures for purchasing, management of accounts, logistics, inventory, community development
  . planning
  . coordination with other units and agencies
  . technical skills as required

- Health Inspectors and Senior Health Assistants/Health Inspectorate:

  . management and supervision
  . health education and community participation
  . spring protection and other technical subjects as required
  . management information systems and inventory control
  . purchasing
  . planning
  . driver education as required

- Health Assistants/Health Inspectorate (posts to be established)

  . health education and community participation
  . spring protection and other technical subjects as required
  . driver education as required

- Health Inspectors, Senior Health Assistants, Health Assistants/Bilharzia Control Unit:

  . laboratory methods
  . study design, data handling, and interpretation

- Laboratory Staff, Rural Water Supply Board:

  . Laboratory and field methods
  . Data interpretation
  . Study design

Budgeting. Improved purchasing and control of funds is required in both the Health Inspectorate and the Bilharzia Control Unit.

Within the Health Inspectorate, funds budgeted for purchase of materials and supplies are often not spent, even though the materials are badly needed in the field. This results not only in constraints upon implementation of the latrine construction program but the danger of reduced allocations to the Health Inspectorate in future. Improved record keeping within the Inspectorate and effective use of available government funds are essential to its future success in meeting its goals.

Budgeting for equipment, supply, and drug needs of the Bilharzia Control Unit are essential to its effective operation. Required budget allocations and responsibilities for supplying the Unit should be established and implemented.

Within the Health Education Centre, responsible for health education materials support of all units, funds for production of health education materials are severely limited. Support for materials production should be increased according to the Two Year Action Plan.

Transportation. While lack of transport affects all units, the problem is especially severe in the Health Inspectorate and Bilharzia Control Unit. Return of vehicles which have been assigned elsewhere to the Health Inspectorate, and replacement of inoperable vehicles which make up the majority of vehicles assigned to it is essential to this Unit. The Bilharzia Control Unit, with only one vehicle is particularly susceptible when repairs are needed. An additional vehicle is needed to make this unit fully operational.

To assist in meeting the above needs for institutional development, technical assistance is recommended as follows:

- Long term

  . Public Health Engineering (2 Years) to help:

    Strengthen and expanding the role of the Public Health Engineering Unit.

    Strengthen coordination mechanism with the Ministry of Health and other appropriate agencies and units of government.

    Extend counterpart and related training.

    Extend sectoral planning and assisting in preparation of a 5 year master plan for sectoral development.

    Plan and implement research, development, and evaluations.

- Health Inspectorate (2 years), contingent upon filling Deputy Senior Health Inspector's post, to:

  . assist in development of effective procedures for purchasing and managing accounts,
  . assist in developing effective procedures for inventory control and management of logistics,
  . provide initial and follow-up training and assistance in supervision, management, and technical subjects,
  . provide supervision and support to staff in the regions,
  . train counterpart Deputy Senior Health Inspector on-th-job,
  . participation in monthly regional staff meetings should be a high priority.

- Short Term to:

  . Public Health Engineering (1 person month) to assist in planning an ongoing evaluation program

  . Health Education Centre (1 person month) to assist in planning and implementing a KAP study

  . Technical Subgroup of the National Action Group (2 person months) to assist in conducting a sectoral manpower assessment

  . Technical Subgroup of the National Action Group (2 person months) to assist in preparation of the five year sectoral development plan

10.4 Program Implementation

Recommendations relating to program implementation apply to on-going activities which constitute part of the existing sectoral development program of the Swaziland Government and are contained in the two year action plan for sectoral development. They are, however, important activities and are included in this report only to emphasize their importance:

Research and development. Water quality meets guidelines in most instances where supplies are derived from wells or protected springs. However, these sources are not always available, and surface sources must be utilized. Furthermore, costs of pumping from boreholes and some spring sources may be a significant burden to some communities. Mountain streams may offer an alternative source which can be distributed by gravity. Surface sources present major problems, however. Intake structures may be subject to damage and may become blocked. These sources also carry a heavy burden of silt during and following rains. Finally, they are invariably very highly polluted.

If surface sources are to be developed, appropriate means must be developed for providing a dependable supply of water which will meet reasonable water quality guidelines and which can be operated and maintained by the community.

Settling facilities, slow sand filters, and alternative chlorination devices have been installed and have been tested. Other treatment facilities including horizontal flow roughing filters will be installed and must be evaluated so that designs can be developed which are most appropriate to Swaziland. This is an ongoing activity which is a primary responsibility of the Public Health Engineering Unit.

Evaluation. In order to asssure that projects are implemented affectively with good community participation; that water supply, sanitation, and health education are linked; that water systems are operated and maintained properly, and that they are utilized properly, their planning, design, and implementation must be evaluated continuously and impacts measured. Only in this way can problems be recognised and needs for improvements identified. Evaluation, to be useful, must be an integral part of the planning and implementation of projects.

In the past a number of evaluations have been conducted for special purposes. Following establishment of practical procedures for carrying out routine evaluation and assessing results, evaluation, review, and program response must take place on a continuous basis. Evaluations should be carried out with participation of the Public Health Engineering Unit, Health Inspectorate, Health Education Centre, and Bilharzia Control Unit, as appropriate.

Planning and design of rural water systems. The Public Health Engineer and Health Inspector/PHE participate in the planning, design, and operation of all rural water supplies implemented under the Rural Water Supply Board. They are also expected to participate in the review of plans for systems

implemented by other agencies and organizations. This is essential to maintaining the health input into such projects and the standard of concern with health during their implementation. The present level of involvement of the Public Health Engineer must be continued.

Planning and review of water resource development projects. An important objective of the Project was the incorporation of health criteria into the planning and design of water resources development projects, including dams and irrigation schemes. This process will be greatly facilitated if all involved agencies understand and agree on the role of the Ministry of Health and the Public Health Engineer, and if appropriate regulations and guidelines are agreed to (discussed in section on Institutional Development).

The Public Health Engineering Unit and Ministry of Health have participated in planning and review of projects only on a limited scale, primarily because little opportunity has existed to do so on more projects. Once the role of these agencies and procedures have been agreed upon, appropriate projects must be identified as they enter the planning phase and participation of both the Ministry and the Public Health Engineer must take place.

Water quality surveillance. Surveillance of water quality is carried out at all water systems which were implemented under the Rural Water Supply Board in order to assure that water quality guidelines are met, to identify problems at individual water systems and initiate their corrections, and to identify general problems for which solutions are required. Water quality surveillance at these systems has served its purpose well and has had a beneficial impact on the rural water program in Swaziland. The surveillance program should be continued and expanded to include water supplies implemented by other agencies and organizations.

Sanitary inspection. Periodic inspection of water supplies has been initiated to identify developing problems and arrange for their correction. Sanitary inspection is carried out in conjunction with water quality surveillance and can be a very effective way of assuring the safety of water supplies. It should be extended to water supplies not implemented under the Rural Water Supply Board at one or two year intervals. Responsibility for sanitatry inspection lies with the Public Health Engineer.

Inventory of water supplies. Collection of information for inclusion in an inventory of water supplies has been begun. This can be important too in planning and identifying needs for maintenance and renovation. The inventory should be completed and maintained up-to-date on an annual basis. This should be done under the direction of and with the assistance of the Technical Subgroup.

Health Education Materials. Materials in support of water supply and sanitation, their benefits, and proper use should be prepared updated, and improved as indicated from evaluations on a continuing basis for:

- incorporation of health education in school curricula
- use in clinic based health education activities
- use by Rural Health Motivators and extension workers in assisting communities
- use by Health Assistants providing support to communities in planning and implementing water supply and sanitation projects

Mass Media support. Continue Ayihlome Maswati programs on water, sanitation and hygiene, providing revised and updated material based on evaluation and changing needs.