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TANZANIA

A NATIONAL ENVIRONMENTAL SANITATION EDUCATION MASTER PLAN

A PRELIMINARY REVIEW

Field Trip Report No. 7
February 22-March 13, 1981

Order Technical Direction No. 26
Prepared For: USAID, DS/HEA

Contract No. AID/DSPE-C-0080

Project No. 931-1176

The WASH Project is managed
by Camp Dresser & McKee
Incorporated. Principal
Cooperating Institutions and
subcontractors are: Interna-
tional Science and Technology
Institute, Research Triangle
Institute, University of North
Carolina at Chapel Hill,
Georgia Institute of Techno-
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9 March 1981

Mr. Paul Ehmer
Public Health Advisor
U.S. Agency for International
Development
Dar es Salaam, Tanzania

Dear Mr. Ehmer:

On behalf of the AID/WASH Project, I am pleased to attach the original and one copy of a report on an Environmental Sanitation Education Master Plan for Tanzania. This was a preliminary investigation by Dr. Kenneth Woolf and myself, and our recommendations are included in the report.

This assistance was requested by the Mission on 10 December 1980. The WASH Project was authorized to undertake the work by AID/Washington, DS/HEA, in Order of Technical Direction No. 26, dated 13 February 1981.

We look forward to your comments and will be pleased to discuss any questions you may have regarding the findings or recommendations contained in this report.

Sincerely,

Dennis B. Warner, Ph.D., P.E.
Associate Project Director

DBW/bml
Attachments

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A NATIONAL ENVIRONMENTAL SANITATION

EDUCATIONAL MASTER PLAN:

A PRELIMINARY REVIEW

A USAID/WASH PROJECT FIELD TEAM

REPORT

Submitted to :

Mr. Paul Ehmer
Public Health Advisor
USAID Mission
Dar es Salaam, Tanzania

Prepared by:

Dennis B. Warner, Ph.D., P.E.
and
Kenneth Woolf, Ed.D., P.E.

9 March 1981

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

SECTION ONE

INTRODUCTION	1
Nature of Request	1
Description of WASH Project Response	2

SECTION TWO

EXISTING SITUATION	3
Method of Investigation	3
Governmental Structure	3
Educational Institutions	6
Local Conditions/Facilities	10
Manpower Requirements	14
Future Development Plans	14

SECTION THREE

NEED FOR EDUCATIONAL MASTER PLAN	16
Ministries	16
Educational Institutions	17
Educational System	17
Local Conditions	18

SECTION FOUR

FURTHER INFORMATION REQUIRED	19
Ministries	19
Academic Institutions	20
Local Factors	20
Manpower Projections	21
Trainer/Educators	21

SECTION FIVE

SUMMARY CONCLUSIONS	23
Key Issues	23
Procedures to be Followed	24

SECTION SIX

RECOMMENDATIONS	26
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APPENDICES

- 1 Order of Technical Direction
- 2 Itinerary
- 3 List of Officials Interviewed

FIGURES

- 1 General Planning and Development Model
- 2 Proposed Schedule for Preparation of the
Master Plan

ACKNOWLEDGEMENTS

The writers wish to acknowledge with gratitude the professional assistance and personal courtesies extended throughout this assignment by Mr. Paul Ehmer, Public Health Advisor at the USAID Mission in Dar es Salaam.

In addition, the enthusiastic and dedicated efforts of Mr. John Ashworth, Manager of the Low Cost Sanitation Unit in the Sewerage and Drainage Division and Mr. B. M. Karabani, Director of Manpower Development and Administration, both in the Ministry of Lands, Housing and Urban Development, have been equally essential to the success of this assignment.

Finally, the writers extend their sincere appreciation to all the officials of the Government of Tanzania who provides their valuable time, the assistance of their respective staffs, and their encouragement.

SECTION ONE

INTRODUCTION

1.1 Nature of the Request

On 13 February 1981, the WASH office received Order of Technical Direction (OTD) No. 26 from the USAID Office of Health (DS/HEA), as shown in Appendix 1. The OTD was issued in response to requests from the USAID Mission in Tanzania for assistance on two separate activities:

1. Preparation of a national sanitation education Master Plan.
2. Recommendations on the size, composition and duration of the Project Paper design team for the Health and Environmental Monitoring Project (HEMP).

This report describes the first activity. The second activity is described in an accompanying report.

In December 1980, the Mission received a request from ARDHI, the Ministry of Lands, Housing and Urban Development, for assistance in preparing an educational Master Plan for environmental sanitation. The nature of the desired assistance was unspecified. The request referred, however, to the current critical shortage of trained personnel and training facilities serving all levels of sanitation in Tanzania. It indicated that the personnel most relevant to the program of environmental sanitation services includes public health engineers, environmental sanitation technicians, health officers, health assistants, and health educators.

In forwarding the request to DS/HEA, the USAID Mission stressed that the Government of Tanzania (GOT) wanted to develop a national plan which would allow it to foresee and then fulfill its personnel needs in environmental sanitation for the United Nations' Drinking Water Supply and Sanitation Decade (1981 - 1990). At the time of the request, no formal work towards preparing such a plan had been done either in ARDHI, other GOT ministries or USAID.

1.2 Description of WASH Project Response

The WASH Project received initial, informal notification of the USAID Mission request on 31 December 1980. From that point until 13 February 1981, the date of the official OTD, the WASH Task Manager conducted preliminary preparations for WASH assistance. These preparations included discussions with DS/HEA, Africa Bureau, and Mission personnel, formulation of possible WASH response, and review of likely WASH consultants. Upon receipt of the OTD, the WASH Project and DS/HEA jointly agreed to send a two-man team to Tanzania over the period of 22 February - 8 March 1981 as requested by the Mission. The team consisted of Dr. Dennis B. Warner, the Associate Director of the WASH Project and Team Leader for the visit; and Dr. Kenneth Woolf, the Director of Training for Camp Dresser & McKee, Inc., the prime contractor for the WASH Project.

SECTION TWO

EXISTING SITUATION

2.1 Method of Investigation

During the investigation, meetings were held with officials from a wide range of GOT ministries and academic institutions responsible for programs in the field of health and sanitation. In addition, local sanitation facilities were visited in order to obtain first-hand information regarding current sanitation problems.

Appendix 2 summarizes the daily itinerary of the team and Appendix 3 lists the officials and other individuals consulted in the course of the investigations. This section describes the existing situation regarding environmental sanitation education and training in Tanzania. As such, it represents a first step in the development of a comprehensive Master Plan for the country.

2.2 Governmental Structure

The Government of Tanzania is divided into a series of ministries, each of which is headed by a Minister who is also a member of Parliament. The Minister reports to the Prime Minister, who in turn is responsible to the Parliament and the President.

Reporting to the Minister is a Principal Secretary who serves as the chief executive officer in the ministry. Each ministry is further subdivided into departments and divisions. Coordination between ministries is normally affected at the cabinet level, although specific coordinating functions may be the responsibility of a ministry.

For example, the Ministry of Manpower Development and Administration is responsible for the formulation of policies regarding the development of personnel resources and for the allocation of all newly trained personnel among government organizations. In most ways, however, ministries operate as autonomous bodies with little effective coordination guiding common interests and activities.

For the purposes of sanitation education and training, the following ministries are important:

- Ministry of National Education (ELIMU)
- Ministry of Lands, Housing and Urban Development (ARDHI)
- Ministry of Water and Energy (MAJI)
- Ministry of Manpower Development and Administration

The Ministry of National Education (ELIMU) is generally responsible for all primary, secondary, and higher educational institutions and programs in Tanzania, with the exception of specialized training institutes established by other ministries for the primary purpose of meeting their own trained manpower requirements. At the higher educational level, ELIMU is responsible for the University of Dar es Salaam, Dar es Salaam Technical College, Arusha Technical College, Karuma Technical College (Zanzibar), and numerous teacher training colleges. Within ELIMU, the Directorate of Higher Education has overall authority over the admission of students, staff assignments, and finance. Most curricular issues, however, are under the control of the parastatal Institute of Education, which determines curricula for all ELIMU institutions except the University of Dar es Salaam (UDSM). The UDSM, which is the only university in Tanzania, determines its own curricula.

ELIMU plans to build a new technical college for engineering training at Mbaya. In addition, there have been preliminary discussions regarding the establishment of a University of Technology.

The Ministry of Lands, Housing and Urban Development (ARDHI) is generally responsible for the development of urban sanitation facilities which include authority for all piped sewerage systems as well as non-piped sanitation facilities. No urban center in Tanzania is fully sewered, but existing systems are found in Dar es Salaam, Tanga, Moshi, Mwanza, and Dodoma. The organization responsible for sanitation works in ARDHI is the Sewerage and Drainage Division (SDD) which was transferred from the Ministry of Water, Energy and Minerals in 1978. The SDD is responsible for both piped and non-piped sanitation systems in urban areas, but the bulk of its efforts currently are devoted to sewerage facilities. In addition to current programs for the rehabilitation and/or expansion of existing sewerage systems, the SDD is conducting detailed studies for new sewerage systems for the towns of Arusha, Moshi, Morogoro and Mwanza. The SDD also contains a low-cost sanitation unit which actively promotes the development of improved pit latrines in urban areas.

Within ARDHI, the Ardhi Institute trains students for sub-professional and professional work in various areas of land development. Established as a survey training school in the early 1960's, the Ardhi Institute was reorganized in 1972 and was declared a parastatal organization with ARDHI by Parliament in 1974. The Institute currently offers programs leading to diplomas in land surveying, urban and rural planning, land economics, building design and building economics. The diploma given by the Institute is considered by the GOT to be equivalent to the baccalaureate degree in engineering offered by the University of Dar es Salaam.

The Ministry of Water and Energy (MAJI) is responsible for all urban and rural water supply development in Tanzania. MAJI also operates the Water Resources Institute (WRI) whose primary training mission is to provide the water sector with qualified technicians. WRI does not intend to provide programs at a level higher than its present three-year diploma courses. Presently, courses are available with specialization in hydrology, hydrogeology, water quality and water supply. A new course for Laboratory Water Technicians is being initiated.

The Ministry of Health is responsible for the promotion of rural sanitation. It also operates schools of hygiene in Dar es Salaam and Tanga for the training of health officers and health assistants plus four additional schools in Mpwapa, Iringa, Mpanda and Ngulu for the training of health assistants. The training of health educators is conducted at the University of Ibadan (Nigeria), as there are no existing facilities in Tanzania for this purpose.

The Ministry of Manpower Development and Administration is responsible for manpower forecasting and planning for the entire country, including both public and private sectors. As the coordinating organization for all manpower development, the ministry reviews proposed changes in training institutions, determines overall enrollments, and allocates the graduates among the various government organizations. Within the ministry, the National Technical Training Advisory Committee (NATTAC) advises on curricula development and training programs.

2.3 Educational Institutions

:

2.3.1 University of Dar es Salaam (UDSM)

The Faculty of Engineering at the UDSM is composed of the Departments of Civil Engineering, Electrical Engineering, Mechanical Engineering and Chemical and Processing Engineering.

Each Department offers a four-year B.S. Degree. The Department of Civil Engineering has a current capacity of 160 students. At present, there are 30 students in the fourth year, 60 in the third year, and 60 in the second year of civil engineering studies. The basic entry requirement for all engineering programs is Form VI with principal passes in chemistry, physics and mathematics. There are 28 teaching faculty members in civil engineering who average 30 contact hours per week. Almost all of the engineering faculty are expatriates.

The civil engineering program follows a general curriculum with little specialization in any one area. All students spend a good part of their first year receiving hands-on training in carpentry, masonry, electricity, and welding workshops. In the third year, there is a course on low-cost sanitation, and in the fourth year, the students choose between a water and transportation emphasis. Overall, however, the Department of Civil Engineering does not attempt to provide specialist education at the B.Sc. level, although such specialization is available at the graduate level. There are approximately seven to ten students in M.Sc. programs and four students pursuing Ph.D. studies.

2.3.2 Ardhi Institute

The Ardhi Institute currently offers a series of three-year programs leading to diplomas in the areas of land surveying, urban and rural planning, land economics, building design, and building economics. There also is a two-year certificate course in land surveying. The entry requirements for the diploma program are the same as the University of Dar es Salaam: Form VI plus principal passes in specified subjects. Each of the five departments accepts 25 students yearly out of approximately 200 applications. The Institute has about 50 resident academic staff, of which more than one-half are Tanzanian.

The diploma offered by the Institute is accepted by the GOT as being equivalent to the B.Sc. in engineering offered by the University of Dar es Salaam. Entry requirements and initial government scale salaries for both university graduates and institute diplomates are the same. The programs at the Institute, however, are even more specialized in scope and practical in content than those at the University. A diplomate of the Ardhi Institute is not a broad-based engineer, but rather a highly trained individual capable of doing professional work in one specialized area of land development.

2.3.3 Schools of Hygiene, Ministry of Health

Health Officers are trained in Dar es Salaam and Tanga. Currently, 50 students annually enter the three-year program leading to a Diploma in Environmental Health Science and approximately 40 students successfully complete the requirements each year. To enter the program, a student must have attended Form IV. There are about 180 Health Officers throughout Tanzania working under the Medical Officers of Health in the rural areas, under the District Medical Officers in townships, and under the Regional Medical Officers in the regional towns. Health Officers are responsible for all environmental sanitation activities in their areas, and they directly supervise the work of Health Assistants.

Health Assistants are trained at six locations in Tanzania. The current intake is 150 students per year for the two-year program. The minimum entry requirement is Standard 7 with some work experience. There are 300 to 400 Health Assistants in Tanzania working in both urban and rural areas. In the urban areas, they are employed by town councils, while in rural areas, they are employed by regional offices. The routine work of Health Assistants includes water supplies, sanitation, rodent control, vaccinations, food inspection, and latrine construction campaigns.

There is a small cadre of six Health Educators in Tanzania. The requirements for this position include a Health Officer diploma plus a one-year health education course at the University of Ibadan in Nigeria. There are no facilities for such training in Tanzania at present.

2.3.4 Water Resources Institute

The Water Research Institute offers a three-year course in Civil Engineering and leads to a Full Technician Certificate (FTC). This course was taken directly from that which is offered at the Dar es Salaam Technical College and was included to complement the latter's production of engineering technicians.

The students are admitted with a Form IV entry requirement, but must also have demonstrated strength in the areas of physics, chemistry and mathematics. In this FTC course, the first two years are fundamental to civil engineering and the third year students are provided the option of specializing in either hydrology, hydro-geology, water quality or water supply. Those who have completed this course may be admitted to the University of Dar es Salaam for professional study in civil engineering.

The present enrollment is 120 students per year with no more than 5% attrition. The present facility and staff capability (28 teachers) limit the enrollment to this amount.

At this time, the graduates are primarily absorbed by the Ministry of Water and Energy, with some being employed by the Ministry of Lands, Housing and Urban Development.

-

The Institute also has a Project Preparation Division which has a large laboratory and provides technical services to the Ministry. This same laboratory is utilized for training

technicians in a new Laboratory Water Technician course. The Ministry intends to develop a network of water testing laboratories on a zoned or regional basis. The success of this plan hinges on the availability of trained technicians.

2.3.5 Dar es Salaam Technical College

The Dar es Salaam Technical College offers programs leading to a Full Technician Certificate and a Diploma in Engineering in the areas of civil, mechanical, electrical, and electronics and telecommunications. The Full Technician Certificate is a three-year program with Form IV as the entry requirement. The diploma in engineering is also a three-year program, but has a Form VI entry requirement. Government entry level salaries for these two levels are TSh. 1035/month for certificate holders and TSh. 1865/month for diploma holders. The diploma from the Technical College is considered to be equivalent to both the diploma of the Ardhi Institute and the B.Sc. degree from the University of Dar es Salaam. At present, the output of the Civil Engineering Department is approximately 75 Full Technician Certificate holders per year and 20 diploma holders per year.

2.4. Local Conditions and Facilities

2.4.1 Environmental Conditions

There is a dire need for improved environmental sanitation throughout Tanzania. The urgency of the situation in both urban and rural areas was clearly demonstrated by available planning reports, field visits to nearby residential areas, and statements of concerned GOT officials.

Inadequate sanitation facilities in Tanzania result in a degraded physical environment and high rates of infectious diseases. In Dar es Salaam, for example, 80 percent of the

population uses some form of on-site sanitation system, the vast majority being pit latrines. However, few of these systems are properly designed and maintained to prevent fly breeding and the escape of foul odors. Many are located in soils of low permeability or a high groundwater table with the result that pits often fill up rapidly and then overflow onto the ground surface. In some areas, broken sewer pipes allow raw wastes to seep to the surface and form semi-permanent pools of sewage. These problems are most severe in the low income and squatter areas, but to some extent, they are found in all areas of the capital. According to reports, similar conditions can be found in most urban centers of Tanzania.

Sanitation conditions in the rural areas are equally severe. The World Health Organization has reported that, in general, there are no improved waste disposal facilities in the rural areas. It is estimated that one-fourth of the rural population is without some form of constructed sanitary facility. The common practice of defecation near the village or in the field has become increasingly hazardous as population concentrations grow under the Ujamaa Village program of the GOT.

High rates of various infectious diseases are the natural consequence of poor sanitation. Schistosomiasis prevalence is estimated at 20 percent nationwide, while the prevalence of hookworm approaches 70 percent in some regions. Tanzania has suffered five outbreaks of cholera since 1974; the 1977-78 epidemic killed over 1500 people. To illustrate the range of sanitation-related diseases which can affect a single area, one need only look at Dar es Salaam where can be found cholera, Typhoid, infectious hepatitis, ascariasis, ankylostomiasis, filariasis, malaria, schistosomiasis, and general diarrheal diseases.

2.4.2 Governmental Facilities

In general, all governmental ministries, and departments and divisions within them, are severely understaffed and inadequately equipped to carry out any sanitation-related programs. Manpower shortages are present at all levels. There are inadequate numbers of public health engineers, public health technicians, health officers, health assistants, and health educators. These shortages are due, in varying degrees, depending on the level of personnel, to a lack of educational programs in Tanzania (public health engineers, public health technicians, and health educators), insufficient capacity (health officers and health assistants), and insufficient funds (all levels).

A few examples will serve to illustrate the personnel shortages. There is only one qualified Tanzania public health engineer in the country. Moreover, there are a few engineering technicians capable of undertaking sanitary engineering works. In the crucial area of health education, there are only six qualified Tanzanian health educators.

2.4.3 Educational Institutions

All institutions providing environmental sanitation education are currently operating at full capacity. These include the University of Dar es Salaam, Ardhi Institute, Water Resources Institute, the technical colleges, and the schools of hygiene. In some cases, however, there are plans to expand or add sanitation-related educational programs.

In the case of the University of Dar es Salaam, the main constraint to expanding undergraduate programs is the limited workshop capacity for first year students. Furthermore, not more than ten civil engineering students per year could be

directed into a public health engineering program if the necessary courses were provided. Other possibilities would be to establish a M.Sc. program in public health engineering or to offer three-month intensive short courses in environmental sanitation. According to Professor N. A. Parker, the Head of the Department of Civil Engineering, it would be easier to establish a new graduate program in public health engineering than to expand the existing undergraduate curriculum.

Recently, a Master Plan for the Faculty of Engineering was completed, but the consultant team was unable to obtain a copy during the visit.

Starting in July 1981, the Ardhi Institute will offer for the first time a three-year curriculum leading to a Diploma in Public Health Engineering. The initial intake of students will be 25 the first year and 50 in succeeding years. The program will emphasize low-cost sanitation, particularly in rural areas. Because of its rapid growth, the Institute is experiencing minor deficiencies in classroom space and major shortages of teaching staff.

The schools of hygiene run by AFYA in Dar es Salaam, Tanga, and other up-country towns suffer from inadequate lecture space, a lack of workshops, shortages of staff, and insufficient transport for field work. As a result, the annual output of qualified Health Officers and Health Assistants is only about one-fourth the total required on a sustained basis. Furthermore, there are no facilities for training Health Educators in Tanzania.

2.5 Manpower Requirements

Comprehensive manpower planning in the area of environmental sanitation has not yet been completed in Tanzania. However, a detailed draft proposal for sanitation education was recently (February 1981) prepared by ARDHI for the current International Drinking Water Supply and Sanitation Decade. According to this proposal, the urban areas of Tanzania by 1990 will need 150 Public Health Engineers, 600 Public Health Engineering Technicians, 150 Health Officers, 450 Health Assistants, and 24 Health Educators. As described in earlier paragraphs, very few of these trained personnel exist in Tanzania today.

The ARDHI proposal also outlined an educational program intended to produce the above personnel totals by 1990. To reach these goals, the first year's student intake should be 50 Public Health Engineers, 150 Public Health Engineering Technicians, 25 Health Officers, and 8 Health Educators. The estimated training, equipment, and support costs for this first group of students was TSh. 30.1 million.

Comparable manpower projections for the rural areas have not been developed.

2.6 Future Development Plans

Those planned programs presently underway or scheduled in the immediate future which will result in the need for qualified environmental sanitation personnel must be considered as part of the existing situation.

Presently, design studies for sewerage are underway in the towns of Moshi, Mwanza, Arusha and Morogoro. Similarly, a contract is soon to be finalized with a consulting firm which is to rehabilitate the presently inoperative sewer system in Dar es Salaam.

There is an increased emphasis on sanitation as a direct result of the International Drinking Water Supply and Sanitation Decade. Tanzania, like most developing countries throughout the world, will continue to take on projects directed at meeting the Decade objectives. The Government of Tanzania intends to extend low cost sanitation methods to urban fringe and low income areas of many cities and towns. In Dar es Salaam, a preliminary design and feasibility study for sewerage and low cost sanitation (mostly improved pit latrines) has been completed.

All of these and other projects will require a host of qualified personnel in the next decade. Once sewers are in place and operating, technicians will be required to operate and maintain the pumping stations, keep the sewers clear and flowing and make house connections. Managers will be required to oversee large-scale sanitary works and service the needs of a growing population.

SECTION THREE

NEED FOR EDUCATIONAL MASTER PLAN

The investigations described in Section Two begin to identify the intense need for a realistic educational Master Plan in the field of environmental sanitation. Since the investigations thus far have been limited, the remainder of this section is related only to general observations.

3.1 Ministries

Discussions with all ministry officials reflected an urgent need for qualified Tanzanian personnel. As an example, the Minister of Lands, Housing and Urban Development (ARDHI) has only one qualified Tanzanian sanitary engineer and this ministry serves the entire nation. Other ministries experience the similar shortages, and the end result is an unstable dependence on expatriate personnel. The turnover is constant since most expatriates serve two- to three-year assignments. It is generally accepted that it normally takes a full year before an individual learns to operate within a new environment. Typically, by the time an expatriate gets some constructive activities underway, his assignment has terminated.

Further, the shortage of qualified personnel limits the progress that can be made in existing programs. In a nation victimized by cholera in epidemic proportions, where education of the public in the use of sanitary methods can save thousands of lives, all of Tanzania has six qualified Health Educators. From the standpoint of the ministries, the demand for a well conceived and effectively managed national Master Plan for the education of environmental sanitation personnel is clearly evident.

3.2 Educational Institutions

The need for a Master Plan is equally necessary when viewed from the perspective of the academic institutions. By its very nature, organization is inherent in a plan, and this is particularly important under the present system which includes a university, institutes, schools of hygiene, and technical colleges.

Compounding the number of institutions involved in environmental sanitation education are other related factors. No single ministry has the responsibility for orchestrating academic programs at all of the above institutions. The Ministry of Education is only responsible for the university and two technical colleges. At the same time, ministries such as ARDHI have their own institutes which operate apart from and independent of those managed by other ministries.

It remains to be determined to what extent the output of the educational institutions parallel the country's development plan. Ideally, the priorities utilized in directly funding support for specific academic programs are established on the basis of national requirements on a broader scale. The development of an educational Master Plan can assist in clarifying those priorities.

A Master Plan and the organizations that would characteristically be embodied in such a plan was generally accepted as necessary by all those who were interviewed.

3.3 Educational System

For the purposes of discussion in this report, it is suggested that the institutions which presently offer courses in the field of environmental sanitation be viewed as part of an educational system. Once this assumption is made, the total system can be seen as containing faculty, staff, facilities, equipment, and operating budget resources.

An educational Master Plan in environmental sanitation, if properly designed, should maximize the use of the valuable resources within the educational system. It would suggest, for an example, where funding can be utilized to achieve established goals by minimizing unnecessary duplication, planning for the future, considering documented needs and supporting on-going projects. The educational system, however, will fall short of its potential unless a scheme is designed to make the goals realistic. Such a scheme is an educational Master Plan.

3.4 Local Conditions

As described in Section Two, local conditions are reaching a major state of urgency and immediate relief is essential. As an example, except for facilities at the university and at a military installation, 15 of 17 pumping stations in the Dar es Salaam sewerage system are inoperative. Small children play in ankle- to knee-deep sewage. Untreated excreta is dumped in inhabited areas and diseases continue to spread.

To make any inroads at all toward easing these and other local conditions, a workforce of trained personnel must be put to work on these problems. Pumping stations and treatment plant works will be made operable under a contract soon to be implemented. However, if the system is not maintained on a regular basis, it will soon shut down and revert to a state of uselessness. Utilization of expatriate personnel should not be considered on a long-term basis in the operation and maintenance area. Thus, it is imperative that local staff be trained and that training begin at the earliest possible time.

SECTION FOUR

FURTHER INFORMATION REQUIRED

Preliminary to the design of any educational plan, it is necessary that a needs assessment be made in order to determine exactly what skills should be provided. A plan designed for one country will seldom meet with equal success in another since each country's location, conditions and environment make its needs unique. To be successful, educational programs should be equally unique for each country. In Tanzania, additional insights are required in order to fully complete the needs assessment.

4.1 Ministries

Within the Tanzanian Government, there exists a number of ministries, each concerned with the management of a major element of the total national organization. In order to quantify the need for trained personnel and to further specify the particular skills which are required, the following determination should be made:

1. Define the role of each ministry and its responsibility in the field of environmental sanitation.
2. Identify areas of mutual interest between the above ministries.
3. Describe the occupational categories (numbers and titles) within each ministry.
4. Identify each ministry's objectives and priority interests.
5. Highlight those areas where objectives cannot or may not be met due to inadequate personnel resources.

4.2 Academic Institutions

To fully appreciate the extent to which local academic institutions can contribute toward satisfying manpower requirements in environmental sanitation, a comprehensive assessment should be made of the following:

1. Inventory current curricula and their degree of relevance to environmental sanitation. Identify instances of duplication and plans for changes and additions.
2. Assess the capability and capacity of local technical institutes, particularly those operated for and by the ministries, i.e., Ardhi Institute.
3. Determine areas of personal interest and capability and, number and composition of local faculties.
4. Investigate the extent to which existing facilities and equipment resources may be made available in future programs.
5. Review any development plans that each educational institution may have adopted which may limit their ability to support environmental sanitation education programs.

4.3 Local Factors

Somewhat less tangible, but yet equally important to the success of an education plan, is the effect local conditions may have upon its implementation. Therefore:

1. An analysis should be made relating transportation systems and the locations of existing and projected training facilities.
2. The attitudes and opinions of GOT administrative personnel should be assessed and projections made regarding their commitment to maintaining and supporting a long-term Master Plan.

3. Social-cultural-economic factors should be outlined and incorporated in the planning.
4. Climatic cycles should be assessed to avoid delays in learning system schedules, i.e., field trips during the rainy season.

4.4 Manpower Projections

Comprehensive planning is normally difficult, and it becomes even more so in the absence of baseline data. Often job descriptions do not exist, records do not reflect past hiring trends, and public and private sector long-range plans may not be realistic. Yet, education plans must be aimed at meeting defined objectives. At a minimum, the following investigations should be undertaken:

1. Identify priority environmental sanitation projects (on-going and future) within each ministry and determine the anticipated manpower requirements by employment classification and with respect to time.
2. Survey the private sector (although small) to determine the need for trained personnel in equivalent classifications.
3. Determine a "reasonable" attrition rate which can be assumed for planning purposes (attrition would include deaths, transfers, retirements, etc.).
4. Establish levels of manpower requirements on a priority basis; i.e., it is necessary within the first two years to add no less than 20 Health Officers.

4.5 Trainers/Educators

A very necessary part of any educational Master Plan is the implementation process. And of that, a critical issue is the instructional and administrative capacity that must be developed in order to ensure the long-term success of the plan.

The following items require further attention:

1. Determine the extent to which future instructional capability is being developed.
2. Assess the existing ability to develop the managerial talent for a national technical educational scheme.
3. Inventory the locally available knowledge and experience in the planning, design, and construction of educational facilities.

SECTION FIVE

SUMMARY CONCLUSIONS

In the light of the investigations conducted thus far, this report has briefly described the present situation, a needs assessment (which required more in-depth study) and implications regarding the urgent need for a broader environmental sanitation education program in Tanzania. These studies have been directed at key issues derived from the request for assistance originated by the Government of Tanzania. The associated responses to those issues are described as follows:

5.1 Key Issues

1. Is there a need for environmental sanitation education in Tanzania?

Response: The local conditions described in Section Two attest to the need for trained personnel who can bring immediate and long-term relief to a critical situation.

2. Is there a need for the upgrading and/or expansion of existing educational facilities, staff, and programs?

Response: Each of the academic institutions is presently operating at the limit of its capability and only accepting 25-30 percent of the qualified applicants for its respective programs.

3. Is there a need for improved coordination and cooperation between the academic institutions?

Response: There does not appear to be very much coordinated interaction between the academic institutions. Greater cooperation could result in more cost-effective utilization of resources, facilities and staff; broader curricular development and establishment of common academic guidelines.

4. Is there a need for comprehensive national planning of environmental sanitation education?

Response: A well conceived plan will increase the degree to which education coordinates with and supports GOT objectives, such as socio-economic growth and development, financial management and sanitary services, and does so in a cost-effective manner.

5. Can the USAID/WASH Project assist in this process?

Response: The personnel associated with the USAID/WASH Project have within its ranks specialists in all aspects of environmental sanitation education who can be made available upon request to assist in the development of a national Environmental Sanitation Master Plan.

5.2 Procedure to be Followed

In Figure 1, a General Planning and Development Model is presented in order to graphically describe the process to be followed in developing the Master Plan. As noted earlier in this report, the problems are well recognized (Step 1); many objectives have been identified (Step 2); and some data have already been gathered (Step 3).

Through the adoption and implementation of the recommendations presented in the next section, the remainder of the Planning and Development Cycle can proceed.

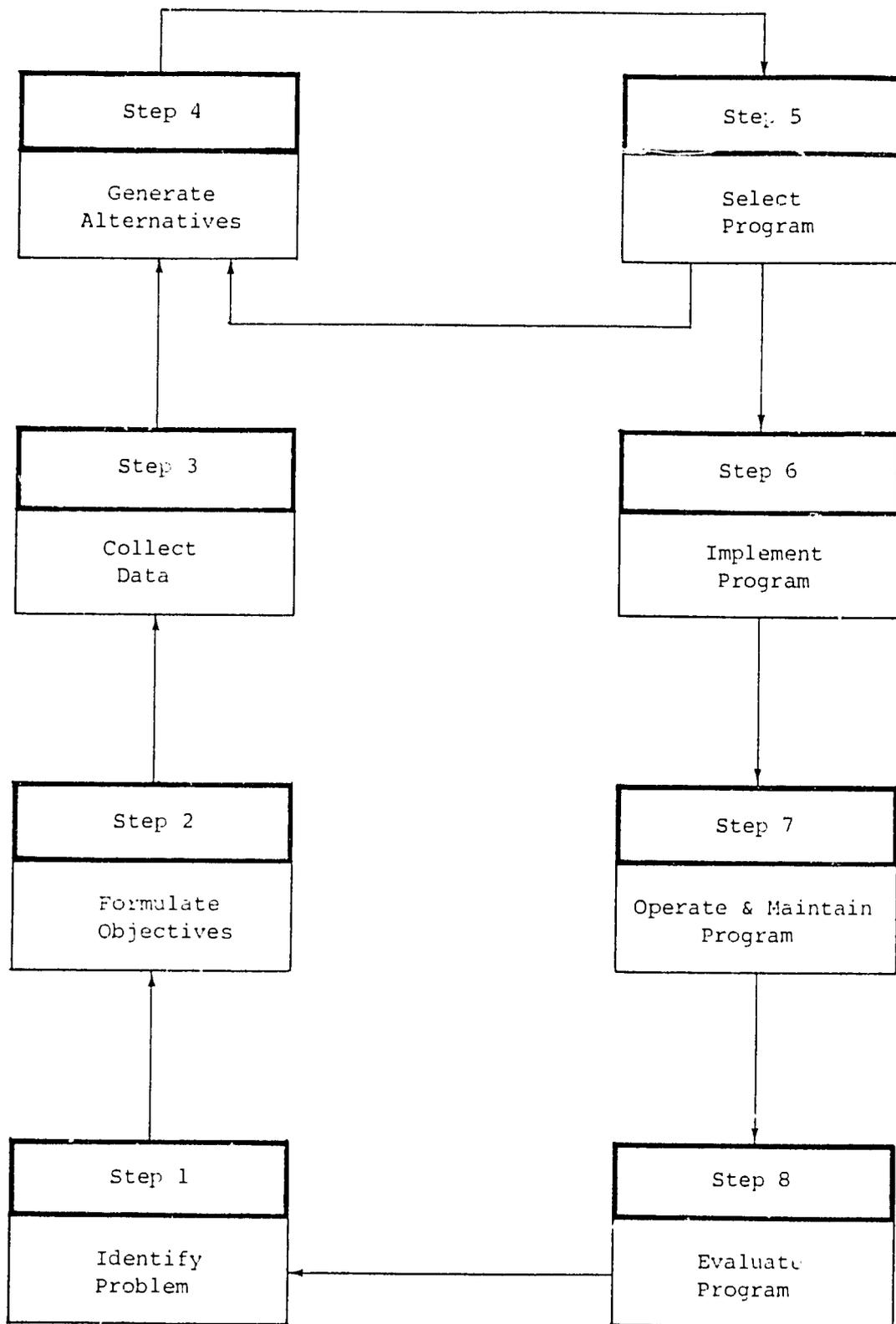


Figure 1

General Planning and Development Model

SECTION SIX

RECOMMENDATIONS

In light of the foregoing information obtained in this preliminary investigation, the following recommendations are submitted for consideration and action by the USAID Mission in Dar es Salaam.

1. A request should be made for the USAID/WASH Project to provide further assistance to the Government of Tanzania in the development of an Environmental Sanitation Education Master Plan.
2. The development of the Master Plan should be a cooperative effort between the Government of Tanzania and a team of up to three specialists in the field of environmental sanitation.
3. The team of educational specialists should include members who have between them the following areas of expertise:
 - Coordination and Planning.
 - Familiarity with educational systems.
 - Technical knowledge of sanitation engineering at the professional, para-professional, and non-professional levels.
 - Technical knowledge of health as it applies to sanitation, including health education.
 - Training/education methodology for developing countries.
4. The team of specialists should undertake a threefold investigation outlined below:

- (1) Complete the needs assessment for a national Master Plan in environmental sanitation education. Section Four of this report provides a basis for this investigation but should not limit the areas the team may pursue.
- (2) Formulate alternative approaches to the development of the Master Plan. Possibilities might include the following:
 - Establishing or designating an internal unit within the Ministry of Manpower Development and Administration as a central entity responsible for collecting/disseminating information relating to environmental sanitation education.
 - Designating NATTAC as the unit responsible for establishing policies related to environmental sanitation education at all institutions beyond secondary school.
 - Creating a separate office or autonomous institution that would have both the responsibility for managing the Master Plan and the authority to direct available resources to ensure long-term compliance with the Plan.
- (3) In cooperation with GOT administrators, finalize a national Master Plan for providing environmental sanitation education at appropriate levels in accordance with the completed needs assessment. The Plan should include, but not be limited to the following topics:
 - Master Plan Objectives.
 - Operational Strategies.
 - Participating Institutions.
 - Implementation Schedule.
 - Evaluation Procedures.
 - Financial Requirements.

5. An approximate schedule for the development of the Master Plan is summarized in Figure 2 and is described below:
- (1) The initial WASH report is delivered to the USAID Mission (9 April 1981).
 - (2) The USAID Mission and the GOT review and approve the initial WASH report. WASH is instructed to proceed with the report recommendations (9-30 March 1981).
 - (3) WASH assembles the Master Plan team (May 1981).
 - (4) The team spends three weeks in Tanzania to complete the needs assessment and prepare a series of preliminary options for the development of the Master Plan. A draft preliminary report describing these options is submitted to the USAID Mission (1-21 May 1981).
 - (5) Copies of the preliminary report are produced in Washington and delivered to the GOT (22 May - 15 June 1981).
 - (6) The GOT reviews the Master Plan options in the preliminary report (15 June - 15 July 1981).
 - (7) The GOT schedules a meeting with the USAID Mission and the team to review the preliminary report and to select the preferred Master Plan option (approximately 15 July 1981).
 - (8) Following the review meeting, the team remains in Tanzania for an additional two weeks to prepare the final Master Plan report in accordance with the preferred option. A draft final report is given to USAID Mission (15 - 31 July 1981).
 - (9) Copies of the final report are produced in Washington and delivered to the USAID Mission (1 - 21 August 1981).

1981	March	April	May	June	July	August
Submit Initial WASH Report	☆					
Review of WASH Report by the USAID Mission and the GOT	<u>3 wks</u>					
Assemble the Master Plan Team		<u>4 wks</u>				
Prepare the Preliminary Master Plan Report (submit draft copy to Mission)			<u>3 wks</u> ☆			
Deliver Copies of the Preliminary Report to the GOT				☆		
Review of the Master Plan Options by the GOT				<u>4 wks</u>		
Review Meeting to Select the Final Master Plan Option					★	
Prepare the Final Master Plan Report (submit draft copy to the Mission)					<u>2 wks</u>	
Deliver Copies of the Final Report to the Mission						☆

☆ = Delivery of Report

★ = Review Meeting with GOT and Mission

Figure 2

Proposed Schedule for Preparation of the Master Plan

2/9

Appendix 1

February 13, 1981

MEMORANDUM

Water and Sanitation for Health Project
Order of Technical Direction (OTD) Number 26

TO: Mr. James Arbuthnot, P.E.
WASH Contract Project Director

FROM: Mr. Victor W.R. Wehman, Jr., P.E., R.S.
AID WASH Project Manager *VWR*

SUBJECT: Provision of Technical Assistance Under WASH Project Scope of Work
for USAID/Tanzania

Refs: A) Dar Es Salaam 00791, 2/9/81
B) Dar Es Salaam 00726, 2/4/81
C) Dar Es Salaam 00713, 2/3/81
D) WASH cable to Tanzania, 2/2/81
E) Dar Es Salaam 00509, 1/27/81
F) WASH Contact Report, 1/23/81
G) Ehmer/Warner Telcon, 1/22/81
H) Warner OTD Analysis, 1/21/81
I) State 005412, 1/9/81
J) Dar Es Salaam 1/8/81
K) Dar Es Salaam 06923, 2 pages of 2, 12/10/80
L) Dar Es Salaam 05634, 10/6/80
M) Dar Es Salaam 05033, 9/5/80
N) Dar Es Salaam 04960, 9/4/80
O) State 137429, 5/24/80
P) Hemp PID, 3/7/80

1. WASH contractor requested to provide technical assistance to USAID/Tanzania as per Ref. K, Ref. G, Ref. F, Ref. E, Ref. C, Ref. B, and Ref. A.
2. WASH contractor/subcontractor/consultants authorized to expend up to (130) person days effort over a six (6) month period to accomplish this technical assistance effort.
3. Contractor to provide final reports of all consultant visits to mission before leaving mission. Consultant should debrief mission and discuss report and follow-up action each time in country with USAID/Tanzania personnel.
4. Contractor to coordinate directly with Mr. Paul Ehmer in USAID/Tanzania on all project matters dealing with Hemp and training master plan aspects. Inform Mr. Tummarello (AFR/DR/ENGR), AFR/DR/HN and Tanzania desk officer of all coordination involving progress, especially ETA's and country clearance of consultants.
5. Make sure individuals in (4) above receive copies of this OTD.

30

6. Contractor authorized to pay for training materials plus graphics associated with the effort up to a total of \$12,000.
7. Contractor authorized 120 international per diem days.
8. WASH contractor authorized to allow consultants to make up to 8 round trips, in and out of Tanzania, as necessary over the next 6 months through Washington, D.C. to his/her home base as appropriate during the technical assistance effort. Consultants should come to Washington for debriefings with AFR Bureau and DS/HEA after each trip. Handle coordination by phone or cable/telex.
9. Mission should be contacted immediately and technical assistance initiated as soon as possible and convenient to USAID/Tanzania.
10. Appreciate your prompt attention to this matter. Good luck.

D. W.
DS/HEA:V.Weelman:ja:2/13/81

Appendix 2

ITINERARY

23 February	USAID Mission Ministry of Lands, Housing and Urban Development (ARDHI) Inspect sewerage and sanitation facilities in Gymkhana and Kinondoni areas and at ocean outfall
24 February	University of Dar es Salaam Muhimbili School of Hygiene USAID Mission
25 February	USIAD Mission National Scientific Research Council ARDHI
26 February	Ministry of Water and Energy (MAJI) Ardhi Institute U.S. Ambassador Ministry of Manpower Development and Administration
27 February	Dar es Salaam Technical College Ministry of Education (ELIMU) USAID Mission
2 March	USAID Mission
3 March	USAID Mission Water Resources Institute (MAJI)
4 March	USAID Mission
5 March	USAID Mission ARDHI
6 March	USAID Mission Ministry of Manpower Development and Administration
9 March	USAID Mission

23

Appendix 3

LIST OF OFFICIALS INTERVIEWED

USAID Mission

Luther House, City Drive, Box 9130, Dar es Salaam, Tel. 22531

Dr. Barry Riley	Deputy Mission Director
Mr. Paul Ehmer	Public Health Advisor
Mr. Cameron S. Bonner	Human Resources Development Officer

U.S. Embassy

Bagamoyo Road, Box 9123, Dar es Salaam

Mr. Richard Viets	U.S. Ambassador
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Ministry of Lands, Housing and Urban Development (ARDHI)

Ardhi House, Kivukoni Front, Box 9132, Dar es Salaam, Tel. 21241

Mr. E.M. Karabani	Director of Manpower Development and Administration
Mr. C.K. Sikri	Senior Executive Engineer, Sewerage and Drainage Division (SDD)
Mr. Fred Njau	Director, Sewer and Sanitation Division
Mr. John Ashworth	Manager, Low Cost Sanitation Unit, SDD
Ms. Hilda Vanlankveld	Sociologist, Low Cost Sanitation Unit, SDD
Mr. Charles Kuhenga	Health Officer, Low Cost Sanitation Unit, SDD
Mr. H.W. Rutachunzibwa	Principal Training Officer

Ministry of Water and Energy (MAJI)

City Drive, Box 9153, Dar es Salaam, Tel. 31433

Mr. S.P. Baraka	Agriculture Director, Manpower Development
Mr. M. Kivugo	Principal, Water Resources Institute
Mr. P. Kusare	Engineer, Water Resources Institute

Ministry of National Education (ELIMU)

Magogoni Road, Box 9121, Dar es Salaam, Tel. 27211

Mr. N.M. Mapunda	Directorate of Higher Education
Mr. E.F. Kiwele	Directorate of Higher Education

Ministry of Manpower Development and Administration

Kivukoni Front, Box 2483, Dar es Salaam, Tel. 20781

Mr. Nyakiragan'yi	Director, Manpower Development
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University of Dar es Salaam

Department of Civil Engineering, Box 35131, Dar es Salaam, Tel. 49145

Prof. Neville A. Parker	Head, Department of Civil Engineering
Mr. S. Gokcasu	Senior Lecturer
Mr. Martin Wegelin	Lecturer

Ardhi Institute

Observation Hill, Box 35176, Dar es Salaam, Tel. 49112

Dr. A.C. Moshi	Director of Studies
Mr. F. Kainamula	Agriculture Head, Department of Building Economics
Mr. Dick C. van Ginhoven	Senior Lecturer, U.N. Associate Expert
Mr. Elifuraha Mtalo	Asst. Lecturer

Dar es Salaam Technical College

Morogoro Road, Private Bag, Dar es Salaam, Tel. 28331

Mr. S.L. Mutesa	Principal
Mr. S.H. Msoma	Vice Principal
Mr. G.M.H. Gulamali	Agriculture Head, Department of Civil Engineering

Muhimbili School of Hygiene

Medical Training Centre, Box 65005, Dar es Salaam, Tel. 26211

Mr. N.J. Mwakipake	Lecturer
Mr. S. Kusko	Lecturer
Mr. S. Kajonji	Lecturer

National Scientific Research Council

Mr. I.A.N. Munisi	Senior Scientific Officer
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Ministry of Health (AFYA)

Box 9083, Dar es Salaam, Tel. 20261

Dr. W.K. Ntuyabeliwa	Ag. Principal Secretary
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Other

Dr. Michel J. Schultheis	Assoc. Prof., Economic Research Bureau, University of Dar es Salaam
Dr. David Baker	Chief Engineer, H.P. Cauff, Consulting Engineers, Dar es Salaam
Mr. Allen McAlpine	Resident Associate, John Burrows & Partners
Dr. Adolfo Mascarenhas	Director, Bureau of Resource Assessment and Land Use Planning, University of Dar es Salaam
Dr. Krisno Nimpuno	Bouwcentrum International Education

176