Eritrean Rural Water Supply &
Environmental Sanitation Program
Water Resources Department

UNICEF
Eritrea

FOCUSING ON HYGIENE AND ENVIRONMENTAL SANITATION IN ERITREA

(DRAFT)

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ACRONYMS AND ABBREVIATIONS

CHA	Community Health Agent
DHS	Demographic Health Survey 1995
ECDF	Eritrean Community Development Fund
ECS	Eritrean Catholic Secretariat
EPLF	Eritrean People's Liberation Front
ERIWESP	Eritrean Rural Water Supply and Environmental Sanitation Programme
IEC	Information, Education and Communication
lpcd	litres per capita per day
MOE	Ministry of Education
MOH	Ministry of Health
NGO	Non-Governmental Organization
PHC	Primary Health Care
TBA	Traditional Birth Attendant
UNICEF	United Nations Children's Fund
VLOM	Village Level Operation and Maintenance
WES	Water and Environmental Sanitation
WRD	Water Resources Department
Zoba	Region, Regional Administration

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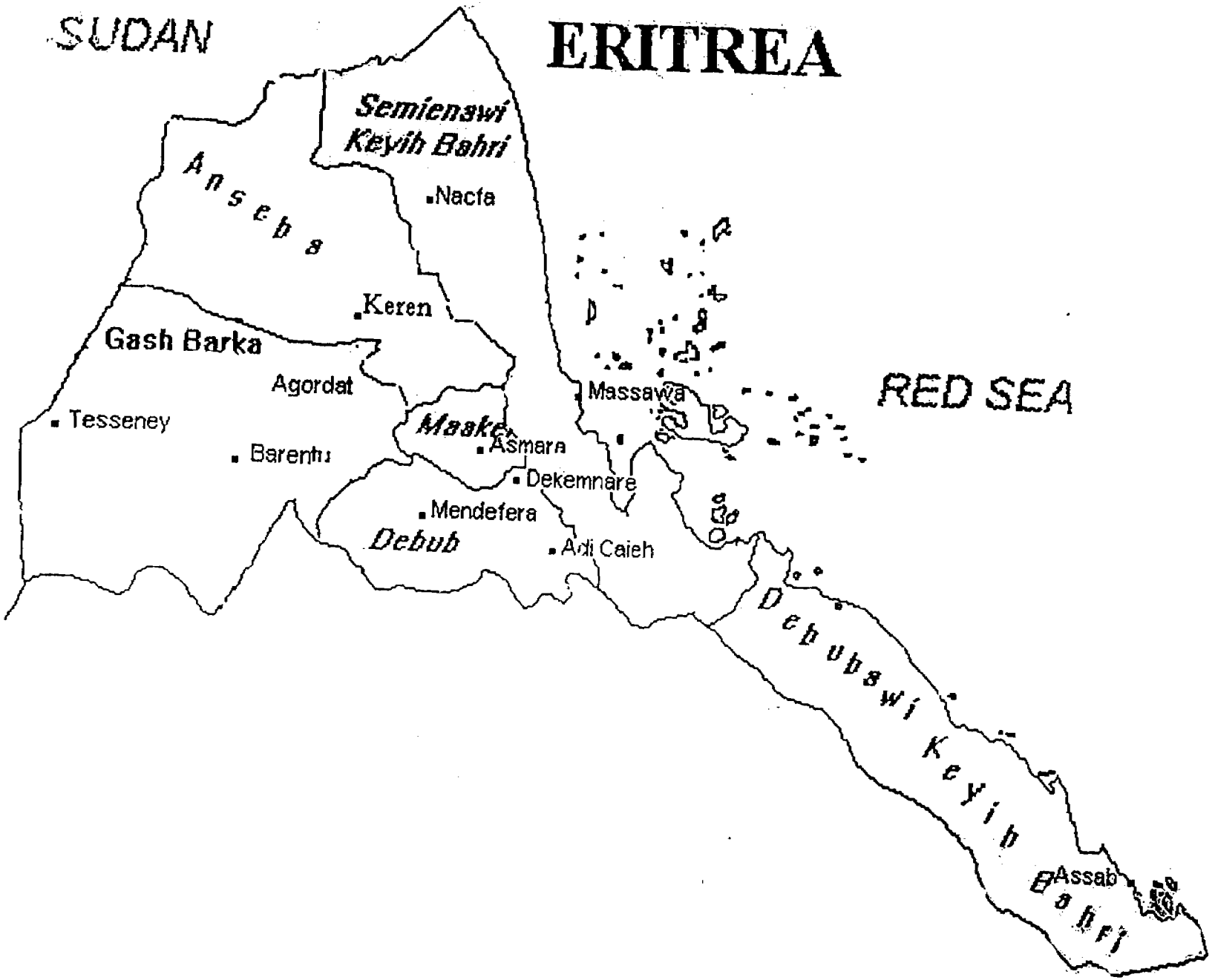
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EXECUTIVE SUMMARY

This study was carried out from 4 November through 4 December 1996. The task, as set by ERIWESP (the Eritrean Rural Water and Environmental Sanitation Programme) and UNICEF was to analyse conditions relating to hygiene and environmental sanitation in rural areas and identify effective and feasible strategies for improving hygiene practices and for increasing coverage of sanitation facilities.

Consistent hygiene and sanitation practices are necessary for ensuring the health and productivity of the next generation of Eritreans. With a concentration on putting infrastructure in place over the past few years, relatively less systematic work has been done in relation to environmental sanitation and hygiene at the community, household and family levels, including maintenance of water sources and all the mobilization and participation processes needed for these. Thus this report should be seen as an initial step. Its focus is on building capacities, identifying strategies which might be tried out and, above all, providing a framework which may be adapted and improved in the future.

Through visits to villages and a review of literature, an attempt was made to examine key features of water, hygiene and sanitation situations in villages as well as potentials. Approaches and plans were discussed with personnel from more than 20 governmental agencies and institutions. There sometimes appear differences or gaps between the visions and needs of groups in villages and the designs and plans produced, quite sincerely, by programme professionals.

Hygiene and sanitation practices

Based on this, a priority list was made of hygiene and sanitation practices. The criteria considered for this were:

- **Will the practice preserve or improve health ? Is it significant ?**
- **Is it compatible with the opinions of Eritrean professionals and governmental policies ?**
- **Are the necessary enabling factors present ? Is the practice/issue realistic ? feasible ?**
- **Is there a demand in villages ? If not, is this practice carried out by households which are identified as being "clean", "neat" by people in the community ?**
- **Does it differ by geographic location or by ethnic group?**

Enabling pre-conditions	Practices	Main Locations
	A. Water Sources	
	1. Protection of water sources (fence, apron, repair cracks in platform, no puddling, separate animals from source)	all
O&M and spares system functioning efficiently	2. Correct use as well as maintenance and repair	all
	3. Clean jerricans	all
	B. Water use and Personal Hygiene	
Water available for example, in less than 30 min. round-trip to source.	4. Increase quantity used to 15 to 20 litres per capita per day.	highlands and selected areas where water use is low
	5. Personal hygiene (washing hands, face, bathing, keep children clean)	all, but with different contents according to location & group.
	6. Home storage 2-cup system, clean vessel	selected
	C. Domestic and Environmental Hygiene	
needs further planning to develop strategies which are acceptable, low-cost	7. Remove animals from sleeping/eating area. Remove fresh animal faeces.	highlands
	D. Disposal of Human Faeces	
	8. Defecation sites away from house and walking paths.	all especially highlands
	9. Latrine construction, use, and maintenance	towns and crowded villages already having some demand.
	10. Disposal of infant and children's faeces.	all
	11. Hand washing after defecation and after cleaning children's bottoms and disposing children's faeces.	

Other practices related to health are, of course, also important. These include, for example, sufficient fluid intake/ORT for diarrhoea and supplementary feeding. However, the present study has limited itself to issues related to the water and sanitation sector.

Strategies and objectives

As part of the development of possible programming strategies, two well-known models of change (BASNEF by John Hubley and the development communications model of Neill McKee) were adapted to situations in Eritrea. An examination of these models demonstrated that too little is known about the contents, methods and management of hygiene and environmental sanitation issues in Eritrea to launch large-scale programmes at once. A greater pool of Eritrean experience and internal assessment is needed.

Thus the objective of the strategy that was developed is to strengthen capacity and try out new approaches within the current institutional frameworks through:

- setting in place community-based, small-scale programmes
- training
- improved technology development and choice
- building on current Eritrean experience and expertise in the governmental and non-governmental sectors.

Special consideration is also given to operation and maintenance of existing water facilities and service to very under-served areas.

The following pages describe sets of related activities which may help create this body of tested experience. One focus is on strengthening support for village-level work and learning. Management and training support from the zoba or sub-zoba administrations for the often new infrastructure and personnel at local levels are lacking. Specifically, there is a great need to fill gaps at the support level for those active in villages (village volunteers for water or health, teachers, health workers) so that the benefits of improved infrastructure in water, health care and education are translated into tangible hygiene, health and environmental sanitation improvement in communities and households.

This means enhancing the capacity of community groups and those who work directly with them. This would involve training and permanent deployment of a limited number of staff.

Another element consists of trial field programmes, pilot projects, at a sufficient scale to be adaptable for dissemination to large-scale. All of those discussed below have been proposed or are being tried out or have been tried out, but on a very small scale.

Possibilities for small-scale programme are described for:

- Water Resources Department (2 possibilities: a pilot programme and O&M upgrading with committee mobilization)
- Ministry of Health (2 possibilities: management support to health stations and latrine-with-mobilization in two sites)
- Ministry of Education (integrated environment clubs, including health clubs)

- **Women's Union (assessing and upgrading current family life education programme)**
- **Youth Union (participation in latrine-with-mobilization programme)**
- **IEC providers (message development, documentation in Eritrean languages and training for social marketing research)**

Please note that the designations of Ministries in this list is one of convenience. It should be understood that this includes Zoba and sub-Zoba personnel, and their colleagues charged, for example, with social services and infrastructure departments as well as ECDF colleagues.

Co-ordination mechanisms are needed. These, including one which may build on an already-operating technical committee, are also described subsequently. Three possible co-ordination mechanisms are mentioned:

- **the programme co-ordination unit (WRD)**
- **social and technical group for low-cost sanitation**
- **somewhat enhanced role for the existing IEC technical group**

These, taken together, are meant to set the stage in perhaps 2½ to 3 years, for significant social mobilization around hygiene and sanitation, of a design and in a way which is determined by Eritreans and their government, rather than being determined by outsiders. Some of the pilot work or initial efforts may, in fact, fail or proceed more slowly than envisaged. This should be expected and even encouraged as long as it leads to learning which is then used to modify and improve subsequent plans and activities. Secondly, these activities are meant to lead to larger-scale application, not to wither as happens to many smaller-scale efforts. With a view to this, an attempt has been made, where possible, to consider how the activities can be built into the on-going programmes of the various institutions at the national and zonal levels. This is particularly difficult as the new structures are just emerging and therefore far more thought and planning will be needed in this regard at a later date.

One gap remains unaddressed. There is a great need for one or more Eritrean professional groups that can provide inputs of high quality for participatory training, management and research. Such professional, non-governmental groups, which may be called resource and training centres, play a highly useful role in other nations (for example, Blair Institute in Zimbabwe, NETWAS and AMREF in Kenya, PAID in the Cameroons, CREPA in Burkina Faso) They also have documentation centres and can help provide expertise, training, research together with an institutional memory which is important. These groups, all of which started on a small scale, have grown in experience and expertise, benefiting also from outside input such as training, putting on joint training with selected external organisations, by working on collaborative projects with their governments and with external agencies, and so on. These same institutions can also provide useful service to Eritrea, but can not replace indigenous expertise. The development of an Eritrean resource centre, for example, for management, training, research relevant to water, sanitation and/or health would be highly useful.

Preface

This study was carried out in Eritrea from 4 November through 8 December 1996. The task, as set by the ERIWESP (Eritrean Rural Water and Environmental Sanitation Programme) and UNICEF, was to analyse conditions relating to hygiene in rural areas and identify the most effective and feasible strategies for increasing coverage of sanitation facilities and improving hygiene practices. This was done through a review of the literature and visits to nine selected villages in different regions. The visits were used to collect qualitative information, with semi-structured questionnaires. These were very useful in providing insights and entry points for the development of strategies which are discussed subsequently. In several cases, institutions were asked to identify sites which would be particularly interesting, illustrating useful styles of working. In addition, there were discussions with professionals from more than 20 different institutions and departments.

The author wishes to acknowledge her sincere gratitude for the collegiality, intellectual stimulation and venturing support provide by the ERIWESP project, its Director, Dr. Yemane Zecharias, Chief Technical Adviser, Dr. T. Giorgis Goitom, and secretary, Mrs. Alem Debesai. Special thanks are also due to colleagues of the Water Resources Department who, despite extremely busy schedules, were able to provide advice and assistance at critical moments. My appreciation must also be recorded to UNICEF, country Representative Dr. Kupano Mukelabai, Programme Planning Officer Dr. Isiye Ndombi, Planning and Evaluation Officer Mr. Turhan Saleh and particularly WES Project Officer Berhane Berhe for support during the study and insightful advice.

Introduction

From the devastation of war, the State of Eritrea has made remarkable progress in the short space of five years. Cities, such as Massawa, have been reconstructed and provide, or are about to provide, consistent basic services. In many areas where pastoralists live, service centres have been organized which are growing into villages and small towns. The Government has undertaken a major restructuring and reorganisation. An active agricultural extension service has been set up. By mid-1996 there were more than 170 clinics and health stations. The post-secondary system is being expanded and new faculties in the university have been set up. For water, which is a high priority in most villages, more than 950 water points have been constructed.

Inevitably, however, the challenges facing Eritrea remain significant, including problems of basic food security and water supply in this semi-arid nation of approximately 2.8 million people. The *Eritrea Demographic and Health Survey 1995* (DHS), a national sample survey, indicates that in the short period since independence, infant mortality (the proportion of infants dying before their first birthday) may have decreased by 25% and child mortality (children dying between the ages of 1 up to 5 years) may have decreased by 17%. This is a significant achievement. Nonetheless, the DHS has indicated that currently one in seven children dies before reaching his/her fifth birthday. In some areas this is one in four or five children. Unlike most countries, the death rate for children from one year up to five years is higher than for infants. This unusual and sad pattern is probably due to inter-related environmental factors such as: lack of food or lack of nutritious foods, malaria, lack of sufficient and safe water, weak environmental and household hygiene, and crowded housing, poor weaning practices.

Water and hygiene-related illnesses figure prominently in this equation of malnutrition-illness and sometimes death. One in four families report that their children experienced diarrhoea within the past two weeks in two different studies (DHS and KAP[1]). Of the leading causes of illness reported for out-patient health care, largely water-washed and water-borne diseases of the skin, diarrhoea and eye infections (including trachoma) accounted for more than one-fifth (22%) of the total (Health Profile, 95-96). Access to safe water is difficult to determine with accuracy, and estimates range below 25% for rural areas. More than 80% of the total population and 99% in rural areas practice open-air defecation.

Without doubt, the population of Eritrea will become healthier, live longer and more productively. The question is how this can be achieved as soon as possible, and as efficientiy as possible for all groups. Thus this report focuses on one part of the challenge: water, hygiene and sanitation. It provides some possible vision for medium-term strategies and some suggestions for short-term activities. With a concentration on putting basic infrastructure in place over the past few years, relatively little systematic work has been done in relation to maintaining water sources, environmental and personal hygiene, or into the education, mobilisation and communication processes needed for these. Thus this report should be seen as a first step. Its focus is on building capacities, identifying strategies which might be tried out and, above all, providing an initial framework which Eritrean professionals may adapt and improve upon in the future.

[1] Nyamwaya, David et al. *Report on knowledge, attitude and practice study relating to water, sanitation and control of diarrhoeal diseases in Eritrea.* Water Resources Department and UNICEF, Asmara, 1996. 169 pages. A summary of the major findings from this study are shown in appendix 1.

CHAPTER 1. VIEWS FROM INSTITUTIONS AND VILLAGES

Through visits to villages and a review of literature, an attempt was made to examine key features of water, hygiene and sanitation situations in villages. In addition, observations and plans relevant to hygiene and environmental sanitation were discussed with personnel from more than 20 governmental agencies and institutions.

1.1 Institutions

Organisations which are involved in implementation related to the drinking water, hygiene and sanitation sector include, among others: Water Resources Department, Ministry of Health, Ministry of Agriculture, Ministry of Education, Eritrean Community Development Fund, Eritrean Women's Union, Eritrean Youth Union, College of Public Health of the University of Asmara, Eritrean radio, Eritrean Catholic Secretariat, Kale Hiwot, Acord, Lutheran World Federation and the private drilling companies. Some of their observations are noted below:

Water

- The Eritrean Rural Water and Environmental Sanitation Programme (ERIWESP) has noted "*Water is a basic human need whose development should be demand-driven, sensitive to equity considerations, strongly supportive of community empowerment...*" (ERIWESP p. 1, 13). Government policy emphasises demand. Furthermore, the policy of the Water Resources Department is to provide 'some for all'. In the challenging semi-arid environment of Eritrea, the Department has opted for policy based on the premise that *"Access to a minimum level of water and sanitation (WES) services is a basic human need"*. At the ERIWESP planning and programming workshop, it was suggested that eligibility be defined as those whose present water supply is less than 10 litres per capita per day, whose distance to a water source is greater than one kilometre and where terrain is difficult (p. 30). For existing water points, O&M systems for spares, training and logistics are not yet in place. This is a priority activity for the Department.

- Some health professionals (and people in villages) point out that one necessary condition for hygiene education is the availability of sufficient water. This, implies that current water sources must function; and communities must be able to operate them correctly and have them repaired quickly. Health professionals agree that health/hygiene education should focus on areas where there is sufficient water. Thus, WRD professionals also stressed the priority need for O&M to ensure the functioning of the standpost and the community organization in support of this.

- Some professionals in NGOs have questioned the reliance on handpump technology stating that villagers favour simpler technology which they can repair easily. It was suggested that the handpump and motor-pump technology gives villages (and women in particular) less control over their water resources. Health and water professionals favour a hand-pump or motor pump solution.

Hygiene and sanitation

- Food security, along with water supply, are the highest priorities in many, if not most, villages. Programmes should reflect this. Professionals noted that hygiene and environmental sanitation programmes are not priorities if basic needs remain unmet. One general goal mentioned is that safe water be available and be used for drinking, cooking and personal hygiene, particularly to prevent diarrhoeal disease.

- Hygiene and sanitation activities must be relevant to the area and ethnic group. For example, many highland villages are densely populated, with domestic animals sharing dwellings with people. Communicable diseases can be a threat in these conditions. The highland villages would therefore be an initial priority for hygiene and sanitation activities. More water tends to be used for personal hygiene in lowland areas, for religious or other reasons. In lowland areas where the under-fives mortality level is higher, deaths of children tend to be related to under-nutrition, malaria. This illustrates one reason why programmes should be differentiated.

- Some professionals note that little has been done with respect to hygiene education and environmental sanitation. An organised start is needed. Other professionals state that the EPLF was active in health and hygiene education, providing a good initial example of outreach into villages.

- A key question is: Does sanitation cover a broad range of subjects and require community involvement and motivation? Some professionals stress the need for sensitive and interactive education; others say that talking to the villagers for a half day or so will be enough to convince them about latrines. Still others say they don't know what to do because, they state, the capacity of the government at all levels is limited. Capacity is limited at all levels. Many posts remain unfilled; and therefore, further small-scale work is needed before launching a large-scale programmes.

- Some professionals note that the VIP latrine is the best technical option for health reasons as it eliminates contamination from flies. Others say that it is inconvenient and too costly.

- Many professionals who are interested in design and construction of latrines are aware of the failure of latrine construction programmes in other countries because of low demand, lack of use, poor programme management. However, this realisation has not yet been translated into programmatic planning.

Strategy and management

- Involvement of, and decision-making by, women is essential in water and sanitation programmes; however, this is difficult to bring about in reality. Ensuring the participation of women in water and health committees is one way to help ensure the participation of women.

- According to its policy, the Ministry of Health (MOH) should be the lead agency for hygiene education and for environmental sanitation. Implementation is planned to be through its network of health stations, clinics and hospitals. The MOH Sanitarian Unit which has only one staff member, is slated by the MOH to be the leading group in environmental sanitation but work with others. Environmental health specialists, trained at the new College of Health sciences in the University of Asmara, will be located in health clinics and would manage sanitation programmes. The first batch will be graduated in three to four years.

- The Ministry of Education, with an important mandate for the education of the future generation, is initiating a pilot integrated environmental programme which will include a focus on health and hygiene.

- Environmental sanitation and hygiene education in rural areas is not a very high priority of either the Ministry of Health or Water Resources Department compared with other infrastructural and basic training needs. Both institutions have limited manpower.

- Government clinics and schools are being constructed near water sources in most cases. Thus, many do not have water. In the schools visited, school teachers do not allow children to use the latrines, where they exist, if there is no water.

1.2 Villages

The following observations derive from (a) the KAP (Knowledge Attitudes and Practice related to health and hygiene) study which was completed in June 1996; (b) village visits including discussions with local administration, water committees, members of local institutions, observations in households, at well sites, clinics and schools; and (c) discussions with field workers. Some of these observations may seem somewhat negative; however, this must be balanced against the fact that a great deal has, in fact, been accomplished in a short time.

Water

- Food security and water were the highest priorities in several villages. There is a strong demand for greater quantity of water within villages. The Knowledge Attitude and Practice (KAP) study recommended far greater emphasis on provision of improved water supplies. There is less demand for improved quality of water (KAP), and that is usually from village administration, rather than users.

- Unprotected sources are the most frequently used sources.

- Many people know that handpump water is meant for drinking; but the amount of water used is governed largely by the distance to source, functionality of the source and cost.

- Where there are improved water points, operation and maintenance (O&M) and spare parts systems are urgently needed to ensure sustained functioning (without which there will be little health impact). Community members are worried about breakdowns and are afraid of the costs for replacement of equipment.

- Current policy emphasizes that ownership of water facilities should be with the community. Ownership appears, however, more complicated with technologies which the villagers can't repair easily. For example, villagers reported that they own open wells. The perceived ownership for hand pumps was more varied (government, local administration, water committee, attendant, the community). Motorised systems were viewed as the responsibility of the government or the water committee. There are a number of privately-constructed open wells which villagers use.

- In areas where there are houses near the source or there are many children and animals, the water points with hand pumps or motors had attendants. There are several different approaches to organizing this such as: women taking turns guarding the pump against children and animals; caretakers who are paid in grain by user families once every few months; caretakers who charge by the jerrican or are paid by village administration (for example, 50 Birr a month up to 300 Birr a month). The new technology is more costly than the old.

- Where users paid by the jerrican, costs were 0.10 to 0.20 cents per jerrican. With this amount of payment, it was seen that poorer people use less water or try to go to other sources if they are available. The water committee members also confirmed this.

- There are longer queues at handpumps than at open wells. Sanitation around all sources, including handpump well sites, is usually poor. Users do not know how to pump correctly and have not have been informed.

- A good report from the review meeting of animators describes in detail the problems faced in organizing water committees. These same observations were seen during the field visits (lack of co-ordination between committees and with the local administration, lack of follow-up...)

- Villagers are not generally consulted on location of water sources.

Hygiene and sanitation

- In highland areas visited fresh animal excreta with many flies, were near or inside houses. Chickens were located in houses. Women and children tend to defecate near the house at night. Personal hygiene needs to be improved, particularly for young children in the highland villages visited. This was also emphasized by health professionals.

- The KAP reported an average of 9 litres per capita per day (lpcd) of water is used for personal and domestic purposes. In the present study, water use in the highlands was usually 1.5 lpcd to 9 lpcd[2]. In lowland areas, domestic use was 10 to 25 lpcd (excluding cloth washing). The difference is significant.

- More than 90% of the people practice open-air defecation. Reasons given in the KAP study were include: (a) there is plenty of open space, (b) limited water means the latrines will get

[2] ... with the exception of two households in the highlands where water use was 20 lpcd.

dirty, (c) not know how to construct, (d) not common in Eritrea, (e) no national programme, (f) people are too poor and have other priorities, (g) latrines are irrelevant for nomadic people.

- Health workers visiting households and giving education/information was only reported for the EPLF workers before Independence, except in one site. There is a similar observation in the KAP study.

1.3 Findings and conclusions

These findings and conclusions were formulated during the present set of visits; however, they are only reported if they also correspond to observations made in the Knowledge Attitude and Practice (KAP) study.

Water

- Highest priority should be given to water-deficit villages and to O&M of water points.

- Distance to water points, functionality and cost of water are primary indicators of how much water will be used. As the Knowledge Attitude and Practice (KAP) study noted: Among many poor people, and in highlands in particular, there is too little water used per capita to enable adequate household and personal hygiene.

  In semi-arid countries, an increase in the quantity of water used is usually an indicator of improved hygiene. Use of more water should be a focus of hygiene education activities in Eritrea, particularly the highlands. Specifically, this would refer to drinking enough fluids, face washing (particularly children), handwashing, bathing, washing the cooking and eating utensils. When monetary payment for each jerrican is too high, people use less water. This defeats the objective of the WRD programme. KAP study reported that one-third of the sample paid 0.25 cents to 1.00 Birr for one jerrican of water (20 litres). The present study showed 0.10 to 0.20 cents per jerrican charged by village committees for government- and mission- installed water sources. Note that in Asmara, the cost of household connections amounts to only 0.05 cents per jerrican while water brought in trucks by vendors costs 0.03 to 0.05 cents per jerrican in Asmara. Thus, for fairness and equity as well as health, the price of water (if charged by the jerrican) should not be more than 0.05 cents per 20 liters. (This would, for example, amount to 10 Birr a month, or 120 Birr a year, for a household of 6 people using 20 lpcd.) Therefore, water and sanitation committees must be helped to set fair prices which for reasons of equally and health, should not be higher than people in Asmara pay for water at household connections.

- Caretakers: At 0.05 Birr per jerrican, an average of 100 cans should be drawn each day to cover a monthly salary of 150 Birr for the caretaker. Monthly payment or payment in kind may be preferable. Observations are needed to ensure that women have adequate access to water points when there is a caretaker. In some countries, women are only allowed to draw water for a few hours a day, and of limited amount when there is a caretaker.

- It is important to provide a list of repair costs and to make a budget with each water and sanitation committee. A clear policy decision is needed about who pays and to what extent when major replacement of equipment is needed.

- WRD has no staff based at the zoba, sub-zoba or village level. For water suipply, field staff are essential at least at the Zoba level. They should be skilled in community organization. Without staff who can follow up at the village level, there will probably continue to be a rundown of investment and capital.

- In a major effort, 254 water committees have been set up to manage water points. They receive very little follow-up support and some (or many) may not longer be operational. In some communities however, it was seen that they can be powerful. New approaches to formation, organisation, training and orientation are needed to ensure that the committees remain active and act to the benefit of the water users. Committee members need training and orientation. The mandate of the committees could cover operation and maintenance, organization and motivation for maintaining the quality of water, community self-help around water and sanitation. Committees should oversee the cleanliness around all water sources.

- From the perspective of the villages, WRD and Zoba staff should also deal with water hygiene from source to mouth. This means cleanliness at source, cleanliness of jerricans, safe storage at home. WRD and Zoba staff should be involved in education or information activities for this. All drinking sources (improved and not improved) should be the focus of education activities.

- Designs of the standpoints should be improved. For example, because there is no pedestal on which to set the jerrican, a large amount of water is wasted, usually creating puddles as there are no aprons and carrying the excreta from animals back into the ground near the wells. Efficient drainage and cattle troughs that can easily be used, and cleaned, are needed.

- Planning and village selection for new water points seems to take place at several uncoordinated levels (Department, animators with surveys, zonal baito, zonal administration). This can cause disappointment and confusion among villagers. Clear terms of reference including the details about the responsibilities of all parties should be included in the contracts with communities. Sites should be selected for wells in consultation with the community, including women.

- Locations of schools and clinics should be selected on the basis of getting sufficient, safe water at low cost. Clear guidelines for planning site selection should be established by the government.

Hygiene and sanitation

- With particular reference to highland villages, latrines are not logical interventions until the fresh excreta of humans and animals are removed from the sleeping area and compound. A latrine-with-education programme usually starts where there is already some demand, for

example, where one-fourth or one-third of the population practices defecation at a site. Demand and need are greatest in towns.

- Construction is easier than good programming. Latrines demand investment, maintenance and continued use (and handwashing) on the part of the household. Therefore, the 'software' aspects such as community organisation and education are as important (if not more important) than technology selection. Experience has shown that motivation for latrines should not primarily be based on health messages. Other issues such as privacy and convenience may be more important to potential adopters. Motivation and demand should be stimulated through all relevant channels before construction. This refers also to programme mechanisms which promote the use of latrines. The VIP latrine is too expensive and complicated to serve as a 'first' latrine for rural areas, and for the lower economic groups in towns.

- Hand washing is not emphasised. This is difficult to motivate; however, the health advantage would probably be significant. People tend to wash hands before eating; however the amount of water and friction (which provides a significant health advantage) is questionable. Cleansing agents not used generally for handwashing. The KAP showed that only 1 in 5 respondents in the sample of 2118 people said they were aware that it is important to wash hands after defecation. However, almost all knew it is important to wash hands before eating.

Institutions

- The concept of "community" needs to be taken into account in programming. The word "community" itself tends to disguise the fact that different interest and economic groups live together, sometimes uneasily, in many villages. During the period of the struggle for freedom, some differences may have been submerged that surface now, during the period of peace and nation building. For example, observations about village priorities can differ for men and women, richer and poorer farmers, village administration and traditional leadership. For water, in particular, it was seen that women and girls may be more concerned than men with walking distance, with waiting time at the source and ease of walking over often rough paths. Investments in villages which do not attend to such differences can actually increase burdens for women and girls. This was seen, for example, in Takita and Hibo villages.

- An often fragile relation exits between usually new institutions and people in villages. Clinic staff require more support through in-service training and supervision to enter the communities and fulfil the potential of the primary health care model. Joint planning with community members could be very useful.

- Women are not consulted sufficiently. They lack time and status and are perceived to lack skills. The current guidelines for water committees contains criteria which favour men, not women, for the important positions in the committee. In addition, government and NGO staff visiting villages should make a special effort to meet with women in more and in less affluent households and at the site of the water point. Women should be asked specific questions. There appears to be a discrepancy between the sincere acknowledgement by

government staff of the need to involve women in contrast to the behaviour of the staff during field visits. How to address this discrepancy deserves to be the focus in training.

- School teachers need training in use and maintenance of latrines, how to manage latrines and water sources with students, as well as the organisation of school health and environment clubs.

- All villages can help themselves to some extent in improving water and hygiene practices. Some villages had considerable resources (garden wells, pumps and pipeline for irrigation, tractors, vehicles, secondary schools, health stations) but had not undertaken some obvious improvements such as: to increase the number of water sources beyond one for domestic use for the entire village, or possibly negotiate with a farmer for partial use of the irrigation well, or to improve cleanliness around existing water sources, or make the paths leading to the sources more convenient for women and children. The village administration seemed to feel that investments should come from the government or a mission, even if local resources existed. This is an issue for discussion with the Ministry of Local Government as well as with community groups and local administration in these villages.

- Professionals working in Asmara and at the Zoba level must visit villages more frequently. It is important to remain in touch. These trips should include visits to households, discussion with people at water source and users of the services.

- For hygiene and sanitation, all partners are needed and all appropriate channels of communication should be used (radio, TBA's, CHA's, water committees, zonal baito). One example of this: TBA's and CHA's could take part hygiene and sanitation programmes.

1.4 Programme resources

There are valuable experiences that could be built on within Eritrea. These begin with the unusual village health activities that were valued by villagers during the liberation struggle. Currently, there are at least four resources that could assist the Government in hygiene and sanitation efforts. These are :

Youth and Women's Unions could be valued collaborators for sanitation and hygiene education in many towns and some rural areas. The current training of trainers by the Women's Union may deserve further support and the inclusion some further water/hygiene topics.

The Catholic Secretariat's experiment with management of outreach from the public health station is an excellent initiative. This is worth disseminating. In selecting possible locations to extend this experiment, manpower and availability of water at the station should be taken into account. Some targeted hygiene and sanitation activities could be included.

The LFA training undertaken by Kale Hiwot has improved the analytical and planning skills of its staff. This training could be a very useful for WRD staff, animators, sanitation staff and colleagues in other ministries. At another level such as the baito, the development of problem trees and objectives trees related to water and sanitation topics would be useful for training.

The UNICEF-supported socio-economic team in Keren could, with some further support be a useful testing ground for organisation around water and sanitation issues.

CHAPTER 2. HYGIENE PRACTICES AND ENABLING FACTORS

2.1 Key hygiene behaviours and practices

Behaviours and practices refer, quite simply, to what people do. A comprehensive list of hygiene issues and behaviours as appears frequently in the literature is shown in appendix 2. One challenge, in any situation, however, is to identify the *key practices*, which have the greatest impact on health, rather than trying to deal with a very wide range of issues. This is practical and also saves resources. Furthermore, experience in many countries has shown that when too many behaviours are targeted at one time in water and hygiene promotion, then often little is accomplished. On the other hand, research has shown that there is no single practice will give as great a health benefit as a mix of practices. For example, the use of latrines alone tends to have a limited impact on diseases which are transmitted through faecal-oral routes. However, latrines together with personal hygiene (thorough hand and face-washing) have a significant impact (Cairncross, 1983, p. 16, See appendix 3). Thus, a challenge is to identify the most significant practices and issues that, together, may have a health impact.

Key behaviours will, of course, change over time. They also differ from one location to another. This is noted, for example, in the new curriculum for the environmental health technicians training programme of the University of Asmara, which states: *More than 80% of the common ailments in Eritrea are infectious and communicable diseases... In many highland areas, villages are densely populated and lack basic sanitary facilities. In the lowland areas, shelter is inadequate and unhealthy, and coupled with the major problem of malnutrition, very often leads to increased susceptibility to diseases...*
As this implies, key water, sanitation and hygiene issues tend to differ between highland areas and lowland areas, among others. It is with such considerations in mind that, a draft list was made of key hygiene and sanitation practices. The criteria considered for this were:

- Will the practice (or mix of practices) preserve or improve health ? Are they significant ?
- Does the practice or issue differ by geographic location or by ethnic group?
- Is the practice compatible with the opinions of Eritrean professionals and governmental policies ?
- Are the necessary enabling factors present ?
- Is the practice/issue realistic ? feasible ?
- Is there a demand in villages ? If not, is this practice carried out by households which are identified as being "clean", "neat" by people in the community ?

The following draft list should not be considered as final: It could serve as a starting point, to be refined by agency staff, village animators, health workers, teachers, community members. It should be modified according to circumstances.

Enabling pre-conditions	Practices	Main Locations
	A. Water Sources	
	1. Protection of water sources (fence, apron, repair cracks in platform, no puddling, separate animals from source)	all
O&M and spares system functioning efficiently	2. Correct use as well as maintenance and repair	all
	3. Clean jerricans	all
	B. Water use and Personal Hygiene	
Water available for example, in less than 30 min. round-trip to source.	4. Increase quantity used to 15 to 20 litres per capita per day.	highlands and selected areas where water use is low
	5. Personal hygiene (washing hands, face, bathing, keep children clean)	all, but with different contents according to location & group.
	6. Home storage 2-cup system, clean vessel	selected
	C. Domestic and Environmental Hygiene	
needs further planning to develop strategies which are acceptable, low-cost	7. Remove animals from sleeping/eating area. Remove fresh animal faeces.	highlands
	D. Disposal of Human Faeces	
	8. Defecation sites away from house and walking pat s.	all especially highlands
	9. Latrine construction, use, and maintenance	towns and crowded villages already having some demand.
	10. Disposal of infant and children's faeces.	all
	11. Hand washing after defecation and after cleaning children's bottoms and disposing children's faeces.	

A few explanatory notes on the items (numbers 1 to 11) in this table may be helpful:

1. *Protection of water sources*

- It should be noted that about two-thirds to three-fourths of the respondents in the KAP study used unprotected sources (KAP, pp. 90-91). In principle, most unprotected water sources and all open wells may be considered to be contaminated. See appendix 4 which describes research results on bacterial contamination. While it is not be realistic to expect that open wells can be free from contamination, the level of contamination can be reduced by relatively simple measures including: provision of an apron and walls, eliminating puddles, removing animals from the immediate vicinity of the well, rope and bucket discipline using, for example, a windlass and suspended bucket. In a bacterial testing study of 150 open wells in India, the author found that approximately 20%, the best managed wells, had faecal coliform counts of only 25 to 100 per 100 millilitres. Badly managed wells had f. coliform counts of 500 to 4000 per 100 ml of water. Thus the protection of open wells can provide a significant hygiene benefit.
- Handpumps create a sealed system which should give very high quality water. However, contamination can occur, for example, when there is seepage from the ground or through cracked platforms. This requires improved maintenance and/or design.
- It is generally considered that routine surveillance improves the control and protection of the water source. As WHO has noted, in poor areas, sanitary inspection by trained community members, usually based on checklists, 'may constitute the only feasible form of routine surveillance." (Helmer, p. 118). Sample checklists are shown in appendix 5.

2. *O&M of water sources.* As has been noted earlier, a system which enables access to spare parts at fair prices and availability of trained mechanics is essential to ensure continued operation of the improved water sources. Handpump users do not seem to have been trained in how to pump. Current pumping practices seems likely to damage equipment; and therefore, correct pumping needs to be demonstrated and explained.

3. *Clean jerricans.* Jerricans should be rinsed or rinsed with an abrasive such as small washed pebbles. This was also highlighted in the KAP study.

4. *Quantity of water used* In those cases where water availability has been dramatically improved, an increase in water consumption may be taken as an indication of hygiene improvements (Boot and Cairncross, 1993, p. 95). Research in Africa has demonstrated that the amount of water used for domestic purposes tends to increase to a range of 15 to 20 litres per capita per day when the round-trip water collection journey drops to 30 minutes (Cairncross, 1990, p. 26). For about one-half of the households investigated by the KAP study, during the rainy season, the trip to the domestic water source took 30 minutes or less (KAP, p. 95). These households may be focal points for water hygiene education. Those further away may lack sufficient water to make education messages relevant. Hygiene education, in other words, may have to follow water availability.

5. *Personal hygiene* Most of these 'key' hygiene practices can be understood as ways of creating barriers to--or ways of interrupting--disease transmission. See appendix 4 which provides a diagram showing faecal transmission routes which can lead to disease. Washing hands has been the subject of considerable research. To clean hands requires friction (rubbing) and preferably a cleaning agent such as soap, sand or ash. Consistent face washing will prevent many eye and skin infections, for example, trachoma.

6. *Storage of water in household.* Using only one cup for dipping and drinking has already received some attention by WRD animators working in villages.

7. *Removal animal excreta.* The main suggested focus in in the Highlands. This issue should be discussed with community members who already do (and do not) separate animals. Realistic options for change must be low-cost in terms of both money and effort. At minimum, fresh faecal matter should be swept to the far corner of the compound, as far from the house as possible, each day. More emphasis is needed on dangers of infection from flies and dangers for children playing with fresh faecal matter of chickens, for example.

9. *Latrine construction and use.* It is suggested that latrine programmes begin in carefully selected sites where there is already some demand. Demand in other locations will follow if the initial programmes are well-organized, affordable, and other enabling conditions are met. It is very important to note that dirty latrines do not offer a health advantage and have been shown to be more dangerous than open-air defecation under some conditions.

10. *Safe disposal of children's excreta.* This is difficult as, in most countries, it is assumed that children's faeces are less dangerous than those of adults, whereas they tend to carry a higher load of pathogens (disease causing agents).

11. *Hand-washing.* Hand-washing at 'critical' times has come to be seen as an important step in blocking infections. Unfortunately handwashing can be difficult to organise within households.

2.2 Enabling factors

As John Hubley has noted: *You should try to avoid putting the blame for a failure of a health education programme on lack of interest or motivation on the part of the community. The distinguished health educator Lawrence Green developed a useful concept that he called enabling factors. Sometimes a person may intend to perform a behaviour but still not do so. This is because of the influence of enabling factors such as time, money, equipment, skills or health services.* (Hubley, p. 27)

Thus, enabling conditions include the availability of water and food. People in areas of severe food deficit or absolute lack of water are unable and unwilling to respond to hygiene promotion. An effective O&M system, which ensures that improved water sources continue to function is another necessary condition. It is suggested that hygiene education be systematically undertaken only in places where population has access to sufficient water... where walking time for women is less than 30 min with one jerrican... or where people are already using more than 15 litres per capita per day.

The question was raised in the first ERIWESP workshop as to whether or not women's time spent collecting water (which would increase if more water is used) is more or less important than the health benefits deriving directly from having more water available in the household. (p.11 ERIWESP) This does not seem to be a relevant question. It would appear that more water sources, and more safe water sources are needed within a half hour's round-trip from the household (including time spent standing in a queue at the pump). Then both needs, that of improved hygiene possibilities and increased convenience for women will begin to be met.

Quantity of water utilized for domestic purposes

To determine approximate water use, ask women, or those who fetch water, how much many jerricans were taken on the preceding day, (but not a clothes washing day). It is helpful to ask richer (using draught animals) and poorer households. For example, during the present set of visits, it appeared that some richer households and poorer households used about the same amount of water in highland villages, even though the capacity of the richer households to obtain water was greater. This did not appear to be the case in the lowland villages visited where wealth and ownership of draught donkeys and camels appeared to be related to the amount of water used. If this observation is correct, then it implies that further hygiene promotion has priority for highland groups.

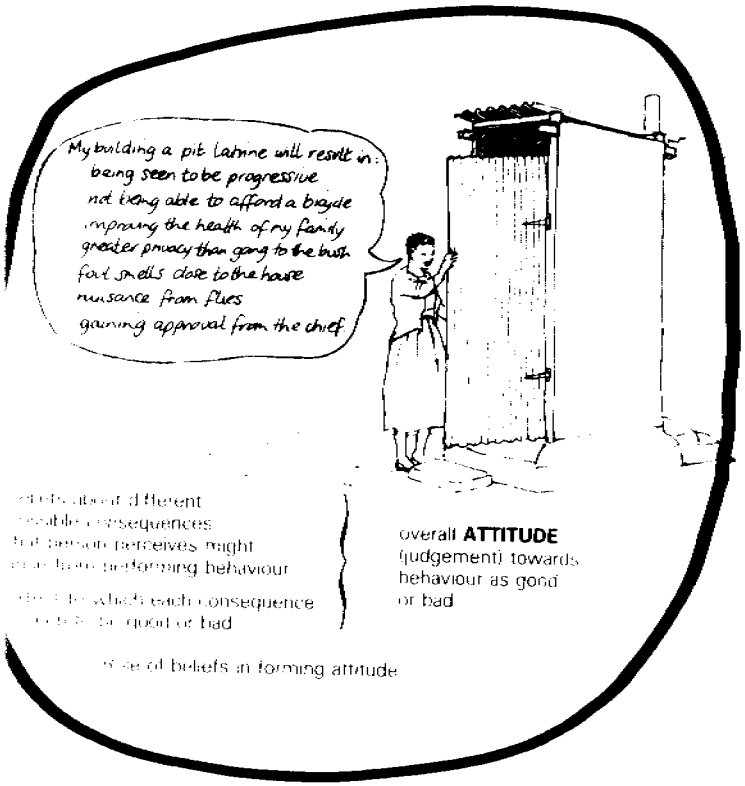
2.3 Improving hygiene behaviours

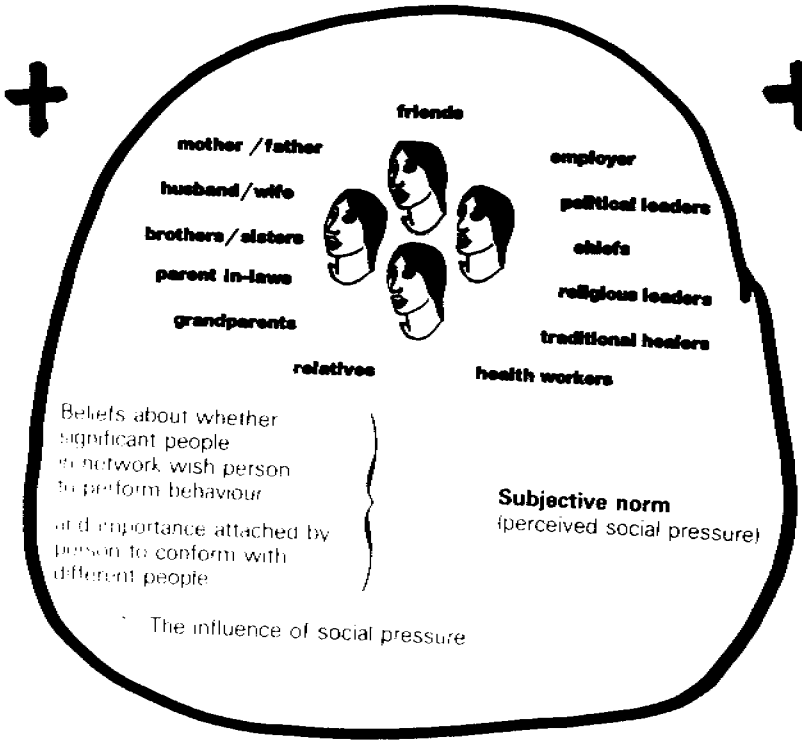
As part of the development of possible programming strategies, two well-known models of change (BASNEF by John Hubley and the development communications model of Neill McKee) were adapted to situations in Eritrea. The word BASNEF derives from the first letters of Beliefs, Attitudes, Subjective Norms and Enabling Factors. The BASNEF model (shown on the next page) provides a framework related to changes in practices and behaviours. It provides a vision of the 'micro' level of change related to practices among individuals, households and small communities. In this, it emphasises the importance of enabling factors, the cultural contexts, beliefs and social pressure from others in the environment and beliefs about the consequences of undertaking a practice or behaviour. It can enrich thinking about hygiene and sanitation. For example, the model implies that:

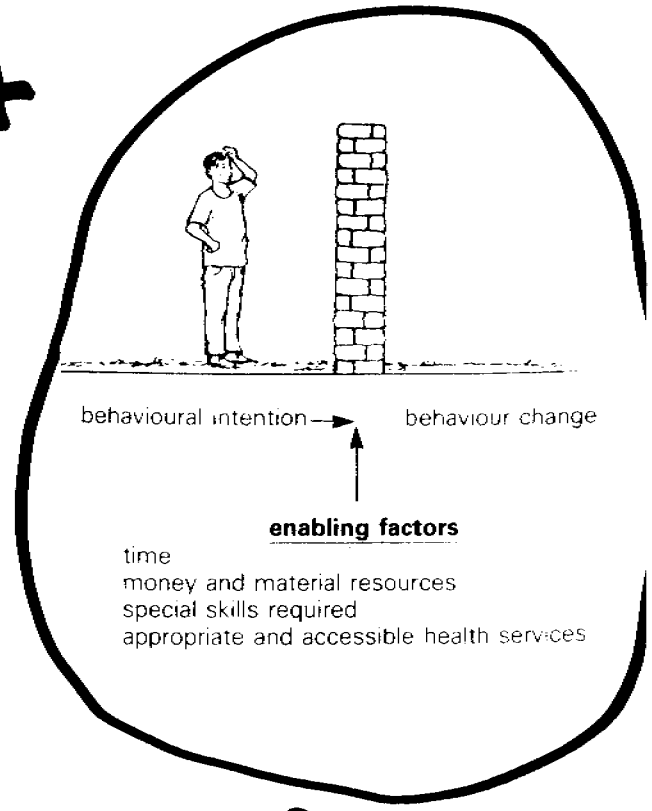
- Motivation for a new hygiene or sanitation practice is not necessarily or even primarily based on health issues, something which field workers should be sensitive to.
- The total network of people in a village are important for change. Thus, convincing local administration about the need for change and making a speech before the village assembly may not be sufficient.
- As noted above, basic enabling conditions must be ensured before change can take place.

The second model, for development communications, has a larger focus: on changes over a region or throughout the entire country. It is illustrated through a diagram showing the groups involved in the Bangladesh sanitation programme. This model, developed by Neill McKee, involves all potential partners at the national, regional and village level. An example for Eritrea may be the campaigns for EPI which have been developed with the support of UNICEF. However, for hygiene practices and sanitation, such as latrine programmes, it may be too early to develop such mass programmes. Further training, capacity development, testing of small-scale or demonstration programmes are needed first. For the WRD, which has no staff at the zoba, sub-zoba or community level, basic staff resources probably must first be assured and O&M activities need to be put in place.

Thus, the BASNEF model may be seen as a first step, leading to larger-scale efforts, such as the development communications approach, at a later stage. This is illustrated on the following pages.







Beliefs about the consequences of performing a behaviour and the value placed on each possible consequence

ATTITUDE (judgement) towards behaviour

Beliefs about whether other people would wish person to perform behaviour and the influence of the other persons

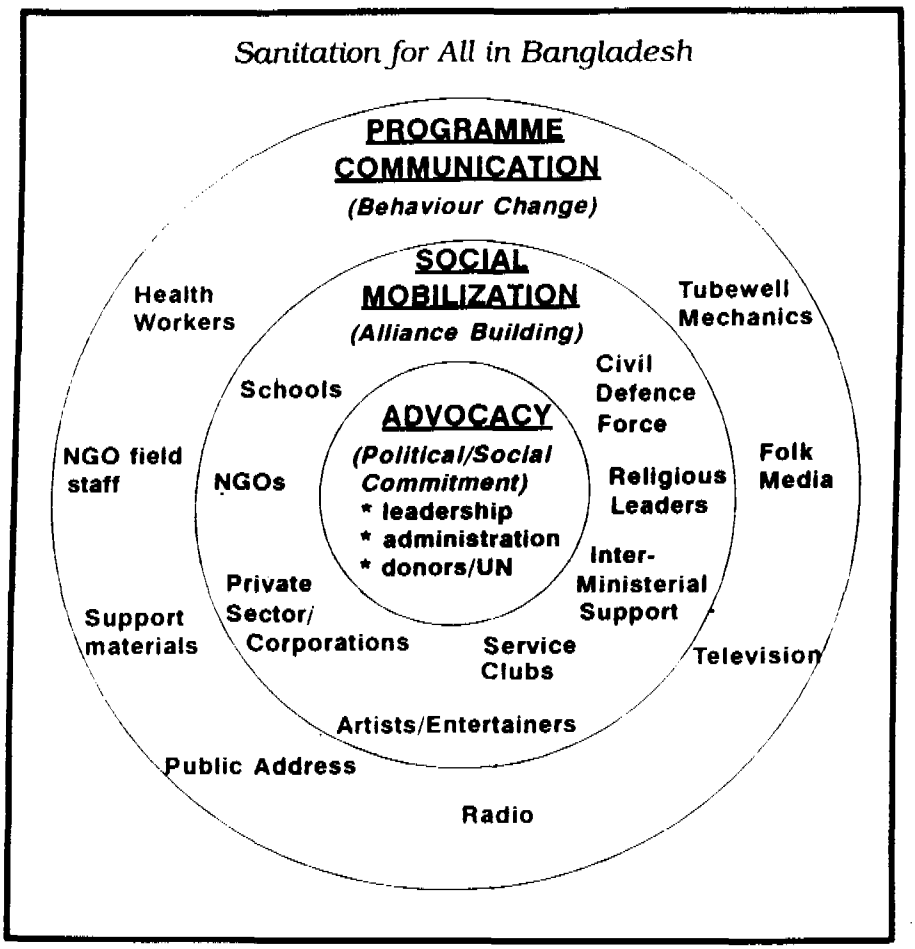
SUBJECTIVE NORM

Behavioural intention → Behaviour change

Enabling factors

Enabling factors

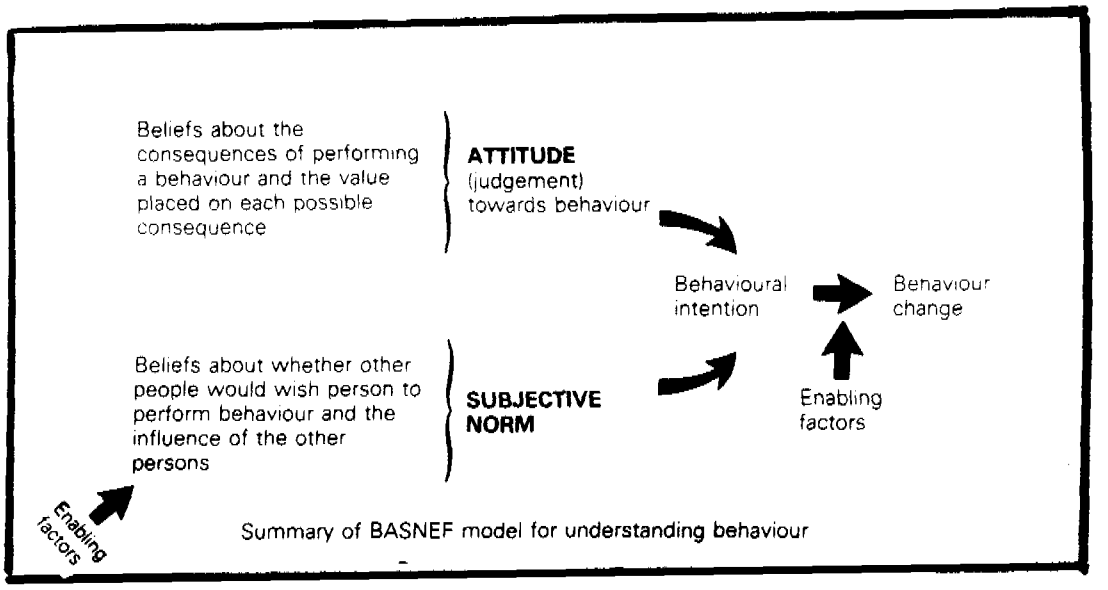
Summary of BASNEF model for understanding behaviour

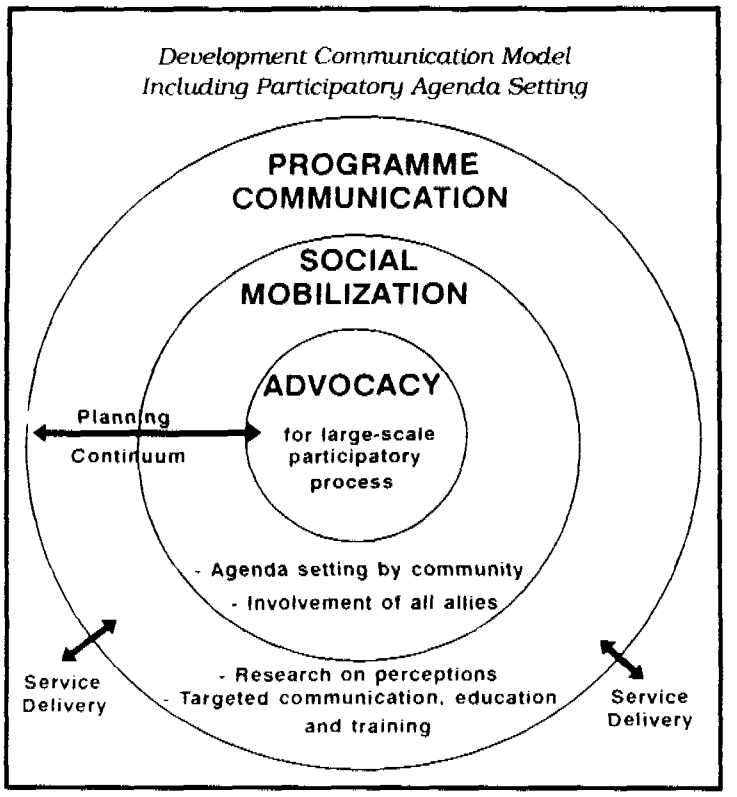


Advocacy consists of the organization of information into argument to be communicated through various interpersonal and media channels with a view to gaining political and social leadership acceptance and preparing a society for a particular development programme.

Social mobilization is the process of bringing together all feasible and practical inter-sectoral social allies to raise people's awareness of and demand for a particular development programme, to assist in the delivery of resources and services and to strengthen community participation for sustainability and self-reliance.

Programme communication is the process of identifying, segmenting and targeting specific groups/audiences with particular strategies, messages or training programmes through various mass media and interpersonal channels, traditional and non-traditional.


Beliefs about the consequences of performing a behaviour and the value placed on each possible consequence
ATTITUDE (judgement) towards behaviour
Behavioural intention
Behaviour change
Beliefs about whether other people would wish person to perform behaviour and the influence of the other persons
SUBJECTIVE NORM
Enabling factors
Enabling factors
Summary of BASNEF model for understanding behaviour


Development Communication Model
Including Participatory Agenda Setting
PROGRAMME COMMUNICATION
SOCIAL MOBILIZATION
ADVOCACY
Planning Continuum
for large-scale participatory process
- Agenda setting by community
- Involvement of all allies
- Research on perceptions
- Targeted communication, education and training
Service Delivery
Service Delivery

CHAPTER 3: STRATEGIES

Before launching hygiene and environmental sanitation activities on a large scale, it is felt that a greater pool of tested Eritrean experience and internal assessment is needed. The activities outlined on the following pages focus on building capacity through training, small-scale research, experimental and demonstration programmes. With the exception of on-site sanitation (that is, latrines-with-mobilisation) the strategy suggested is one of infusion, that is, integrating hygiene contents into on-going programmes. In some cases, implementation and management support may also be needed, to ensure that the infusion approach can work.

The following pages describe sets of related activities meant to create this body of tested experience. One focus is on strengthening action in villages. Further management and training support from the zoba or sub-zoba are needed for the often new infrastructure and personnel in the village. Specifically, there is a need for more support for those active in villages (village volunteers for water or health, teachers, health workers) so that the benefits of improved infrastructure are translated into tangible hygiene, health and environmental sanitation improvements. This means enhancing the capacity of community groups and those who work directly with them.

Another element of the approaches proposed are trial field programmes, pilot projects, at a sufficient scale to be adaptable for dissemination to large-scale. All of those which are discussed subsequently have been proposed, are being tried out or have been tried out but on a very small scale. Some suggestions for each of these activities are provided in the following chapter.

Co-ordination mechanisms are needed. These, including one of which may build on an already-operating technical committee, are also described subsequently.

These activities, taken together, are meant to set the stage in perhaps two-and-half to three years, for significant social mobilization around hygiene and sanitation, of a design and in a way which is determined by Eritreans and their government. Some of the pilot work or initial efforts may, in fact, fail or proceed more slowly than envisaged. This should be expected and even encouraged as long as it leads to learning which is then used to modify and improve subsequent plans and activities. These activities are meant to lead to larger-scale application, not to wither as happens to many smaller-scale efforts. With a view to this, an attempt has been made, where possible, to consider how the activities can be built into the on-going programmes of the various institutions at the national and zonal levels. This is particularly difficult as the new structures are just emerging and therefore more thought and planning will be needed in this regard at a later date.

One gap remains unaddressed. There is a great need for one or more Eritrean professional groups that can provide inputs of high quality for participatory training, management and applied research. Such professional, non-governmental groups, which may be called resource and training centres, play a highly useful role in other nations (for example, Blair Institute in Zimbabwe, NETWAS in Kenya, PAID in the Cameroons, CREPA in Burkina Faso) where they also have documentation centres and can help provide expertise, training, research together with the institutional memory which is important. These regional institutions can also provide useful service to Eritrea, but can not replace indigenous expertise. These groups, all of which started on a small scale, have grown in experience and expertise, benefiting from

outside input such as joint training with selected external organisations, by working on collaborative projects with their governments and with external agencies, and so on. The development of an Eritrean resource centre for management, training and research relevant to water, sanitation and/or health would be highly useful.

CHAPTER 4. POSSIBLE ACTIVITIES AND APPROACHES

Hygiene and environmental sanitation are not yet high priorities in many villages or among Governmental agencies at this time. Within the Government, the greater focus is with putting effective basic infrastructure and operating procedures in place. Nonetheless, both hygiene and sanitation are necessary to ensure that the investments in infrastructure fulfil the promise they hold. Thus, for example, consistent hygienic practices are needed at the water source, in transport and storage of water at the household to ensure that the quality of water is maintained.

Hygiene and environmental sanitation require certain enabling factors, as has been mentioned. Thus, it is important to target interventions on areas where these preconditions exist or will soon exist. For this, it is suggested that:

- activities for improved household and personal 'water hygiene' practices focus on villages where water can be obtained within a 30 minute round trip by a woman walking or at least by a donkey/camels baring water.
- hygiene improvements around the water points be targeted on all water points
- latrine construction focus on areas where there is already some demand, for example, one-fourth to one-third of the population already practices localised defecation or uses rudimentary latrines. This implies that initiating latrine programmes where there is no demand is a less effective use of resources than beginning in larger, crowded villages or towns where there is a felt need. It may be easier to launch latrine programmes in large towns such as Keren and smaller but crowded villages.

4.1 Department of Water Resources (WRD)

Effective community mobilization and O&M systems along with community ownership will help ensure that the intended benefits of water points can be realised. It will also save resources in the long run, by reducing the run-down of equipment and number of repairs and replacements. In addition to activities such as policy development and legislation, the Department intends to emphasize training for O&M and community participation in the immediate future.

Community organisation/education activities could focus, firstly, on O&M and sanitation around the standpost and, secondly, on community self-help and relevant hygiene/environmental sanitation activities. The period before the water source is installed or upgraded, and the months afterward, when the system is working well, is usually 'opportunity time' when there is considerable interest and motivation. During this period, the communities are open to information and activities related to water and sanitation, for example, how to use the pump, safe storage of water, cleaning jerricans, washing hands (and faces of children) and so on.

4.1.1 *Water and sanitation committees*

'At the community level, responsibility will be through Water and Sanitation Committees...' (from the section on the proposed institutional framework for rural water and sanitation services, ERIWESP, p. 26). It is certainly worth the effort for the WRD and its counterparts at Zoba and local levels to promote water hygiene around all drinking sources. This refers to the maintenance of water quality from source to mouth. In education activities, it does not make sense to community members if this applies only to handpumps while no reference is made to open wells in the village which are usually very contaminated. Thus, the mandate of the Water and Sanitation Committee could extend to all drinking sources in a community. The Department and Zobas should not omit water hygiene promotion as an integral part of the water programme, because at present the very poor hygiene reduces the value of the investment in safe water.

However, the committees, 254 of which have been formed, should only be initiated when an improved water source already exists or will definitely be implemented. Organising them where there is no local improvement may be disillusioning. In addition, an important lesson learned too late in several other countries is that electing a group of people does not make a working committee. Committees require support, some training and follow-up.

Possible roles of the water and sanitation committee

1. Organizing repairs and finance for repairs/replacements.
   This refers to issues such as: Does the community, for example, have the will and organisational capacity to make major repairs and replacements ? Can people afford to pay for replacement? For example, if the replacement of a handpump costs 10,000 Birr for a village with 100 households, people should be aware of this level of cost (100 Birr per household) at the outset.

2. Proper operation & maintenance of handpumps and equipment.
   Included in this is pumping in a proper way, control of animals at the standpost. Where there are attendants, the question of payment often arises. Payment should not be at such a high level that poorer people reduce the amount of water used. This defeats one important purpose of the new water source which is improved health and hygiene through improved access to safe water.

3. Maintaining the quality of water from source to mouth
   This would include cleanliness around water sources, aprons without cracks around standposts, eliminating puddling and faecal matter of animals around the source, walls with windlasses or hanging buckets around open wells. It would also include with promotion of cleaning jerricans and safe storage of water at home.

4. Self-help and community self-improvement for communities with sufficient resources.
   Some communities which have a reasonable level of resources had done very little, or nothing, for themselves to provide new water sources or improve access to existing ones. This was observed in Demas, Hebo, Engerne, Takita. These were villages which have resources, though un-mobilized. They could be organised for activities such as: improving the path (and therefore access) to the new water source; upgrading, or even implementing traditional water sources; negotiating with owners of garden wells for public access; organizing latrine programmes.

The current water committees are supposed to follow written guidelines which were issued by the Ministry of Local Government and the Water Resources Department. In many countries such centralised guidelines are often not tested and not relevant to all geographic regions and ethnic groups. Guidelines should, therefore, be reviewed and if possible re-written, building on observations in villages, including observations of power structures. The following ideas may deserve consideration as well for water and sanitation committees:

- About the formation of committees, John Hubley, a leader in health education, has suggested: *Select people already respected by the community, such as leaders of programmes, TBAs, traditional healers, those who represent groups the programme is trying to reach. Give them practical training and regular follow-up.* (pp. 121,125). Several (though perhaps not all) members of the committee should represent groups in the community such as the school, health station, Women's Union, Youth Union, religious groups. This could add stability and the capacity for greater mobilisation or outreach into the community.

-Local administration should be represented or head the committee. It was noted during the visits and, as had earlier been described by the animators (see their meeting report) that the relation of the village administration with the committees can be difficult. One useful device to balance the power of members of the local administration who are on water and sanitation committees, might be to have a separate convenor, such as the committee secretary. Further consideration is needed about this.

-All committee meetings should be open to the public, require a quorum of at least 4 members. All decisions should be agreed unanimously among all members and recorded. This should be true even if local administration leads the committee.

- A member who does not attend, for example, 3 meetings is dropped. A committee that does not meet in, for example, 4 months, can be reformed.

- All committee members need orientation on several issues such as: how to operate a pump; how and where to report breakdown; maintenance with a checklist (one page with pictures) to remind them of maintenance and standpost hygiene rules. Furthermore, they need to be involved in discussions about the goals of wart supply, including improving hygiene and health aspects of water, including use for household and personal hygiene, if not also sanitation issues.

-The contract with the community should clearly describe the duties of both parties, including responsibility for repair (community). An upward referral procedure is needed so that, if department staff or area mechanics do not carry out their responsibility, then there is recourse to a higher authority.

-It may be important to provide each committee with a list (and careful explanation) of costs for spares and replacement of entire handpump equipment. In addition, the current policy which states that replacement is the community responsibility requires careful capacity-building at the community level.

4.1.2 Management of water interventions

The government should fund all software elements such as training in O&M, management support and IEC as these are the foundation for achieving sustainable community management of rural WES systems (ERIWESP, p.34).

Presently, the WRD has no staff at regional, sub-regional or village level. The animators (field personnel working with communities) are on short-term contracts which provide no consistent field-level follow-up. However, to achieve effective O&M and community organisation, a permanent field presence is needed at least at the Zoba level. This presence, whose purpose is effective mobilisation, requires community workers and not technicians or engineers. Thus, a possible minimum staff loading at the Zoba level would be one technician and 2 or 3 animators. In terms of their work, the data collection activities of animators should be limited to include only that which is needed and will be used in programming.

Community organisation and participation takes time and planning. A trajectory of steps for work with the community should be planned, based not on a fixed number of visits, but on the completion of each step. Allowing an average of 5 visits (one full day plus 4 visits of 3 to 4 hours), means that it might take three animators about a one year (based on 20 days in the field) to work with the committees in the 150 sites being upgraded in the current programme in Gash-Barka. In addition, at least 2 to 4 visits are needed (once each 6 months) after installation/mobilisation activities are complete. This is not an excessive number of visits compared with some other programmes.

It is not clear if the committees are told to have attendants but are then left to determine their own means of payment. It may not always be necessary to have a caretaker at the site. As was noted, some projects have had the experience that access for women is more limited when there are male caretakers who, for example, set opening times and charge by the jerrican.. For reasons related to equity and good hygiene, payment in money should be kept to a minimum (a maximum of 0.05 cents a jerrican was earlier suggested). "*The basic principle for the provision of WES services should be a demand driven approach*" (ERIWESP, p.13). This seems to work well for the selection of communities; however, the 'demand' factor for water means that poor villagers will reduce the amount of water used before they complain about high charges since there are usually few alternative sources. Thus it was seen in the community visits that higher charges can eliminate the health advantage offered by the improved source. Alternate payment in kind (grain, for example) is already being implemented in some areas.

Planning with respect to prioritising villages for implementation of new or improved water points seems to take place at several relatively uncoordinated level. Baito personnel are apparently engaged in prioritising requests for new water points; while animators were collecting data for the same task. Unattended requests from local assemblies can lead to disillusionment (as has happened in some countries which are in the process of decentralising). Nations such as Ghana have mounted education activities for their district assemblies related to water, hygiene and health to good effect.

Site selection should be done in consultation with the community. There were several complaints about this not being done by villagers.

The Water Resources Department should be congratulated on its sincere effort to involve women in the management aspects of water systems, reportedly often with good results. Nonetheless, women who usually fetch water and care for families, are much less involved in decision-making about their water sources. One barrier to this may be that the guidelines for the water committees emphasize literacy and numeracy skills to such an extent that most women will not be eligible for the key positions such chairperson, treasurer or secretary. It may be easier to bring women into committees if the guidelines are changed. It is also suggested that during their field trips, Department staff and animators visit at least one household and talk with women around the water point. This is one small way to obtain feedback from community women which may normally be lacking.

"A project approach is understood to mean the funding of discrete projects either on a self-standing basis or within the context of an established national rural water supply and sanitation programme" (ERIWESP, p.34). Minimum guidelines are needed for all External Support Agencies that may become involved in water and sanitation projects within Eritrea. Such guidelines might relate, not only to technology choice, but also to the need for committee formation, O&M systems, consultation with community members and not only the local administration.

The preceding ideas do not, however, answer the major demand of communities for more water. One approach to providing more water is to upgrade technologies for motorised systems to bring water nearer the user. The two motorised systems seem will probably not last long under community management. Unfortunately, as is the experience in other countries, motorised systems must be approached very carefully and with strong, continuing management input from the department, particularly at the beginning. This means that motorized systems require much higher investments of field worker's time and higher investments for O&M training as well as spares. The over-head needed to sustain motorized systems is much higher.

Another issue related to the demand for more water are the villages, usually far from roads, which do not yet have even the minimum of provision within one hour's round trip. Many of these have apparently been identified but not all have been acted upon.

These ideas and others being developed within the ERIWESP and the Department require critical appraisal, testing and refinement. It is strongly recommended that a demonstration activity be organized with villages selected as testing areas for the Ministry and Zoba administrations. This would also enable the recommendations of the ERIWESP programme to applied practically. Locations should preferably be clustered in different regions of the country. It is also suggested that ECDF be involved as a partner and that some sites be the same as those where health management and school environmental pilots may be undertaken. A zoba-level office should be set up for this. A period of two to three years is recommended.

Monitoring and assessment

"For purpose of accountability, there should be scope for the participation of stakeholders in the development, application and evaluation of regulations (p. 14, ERIWESP).

Evaluatoin and monitoring, until the past decade, have tended to focus of financial utilization and construction outputs. Less emphasis has been given, in most countries, to assessing the 'effectiveness' of interventions, for example, continued functioning, maintaining the quality of

the service, the use of facilities and the impact of utilization. These issues can be complex to monitor; and, given the extremely limited manpower available in government service, can best be monitored by community groups and those who work directly with them. The participation of user groups and field staff in assessment can also be used to control or improve the implementation and management of facilities. A few concrete examples of such an approach are:

- Establishing written contracts which detail the main responsibilities of all parties (including the contractors and government staff), also including means for referring problems to higher authorities.
- Providing a maintenance/hygiene checklist for the water source to the field worker and to the water and sanitation committee, together with training in its use. Some projects develop such checklists with communities. Checklists can also be made in a picture format for illiterate groups.
- Checking the quantity of water used by asking women how many jerricans of water they used the day before. Dividing this by the number of people in a household gives an adequate idea of the amount of water used for hygiene and domestic purposes. The indicator of achievement could be: increasing the quantity to 20 lpcd.
- Having a greater proportion of committees in which women hold leadership positions.

4.1.3 Training

"On HRD issues, the workshop was truck by the gap which exists between the current pool of human resources (numbers, skills and experiences) and the minimum requirements which need to be satisfied for effective functioning of the rural WES sector. (p. 3 ERIWESP).

Field staff and Ministry staff require training and opportunities for joint planning as well as information sharing. Useful training activities could include:

- *Logical Framework Analysis* or problem-and-objective trees as, for example, was carried out for Kale Hiwot staff to very good advantage.

  Benefits: Helps participants connect concepts and activities; thereby improving analytical skills, can be used for planning.
  Focus : Only one subject at a time, such as sanitation or hygiene.
  For whom : In different versions this training can be very useful for WRD staff, field workers, Zoba Development and social services Division, selected Baito members.
  Trainers : Eritrean preferable (check Kali-Hiwot). If none available; co-training with external trainers. Duration : 3 days to 5 days.

- Training in *participatory approaches*

  Benefits: will improve communication skills of staff working with communities, stimulate 2-way communication, community-based planning.
  Focus : training on participatory approaches and community/committee mobilisation, including simple things such as how to 'talk' with community groups. Also: site selection, committee organization, training of community members, committees and attendants.
  For whom: All field staff, engineers, hydrologists, selected staff from ECDF and Zoba

Trainers : Capacity exists in Eritrea, for example, Norwegian Church Aid.
Duration : Variable, less than 2 weeks. To be repeated.

- *Repair, Operation*
  Benefit: will reduce down-time, speed repairs
  Focus: correct pumping of hand pump, greasing & maintenance, simple reapirs, how to report breaks/faults, how to collect funds, funds needed, specific planning for these, major repairs. Include hygiene information.
  For whom: separate training for water and sanitation committees (2 days), attendants (2 days); and for area mechanics.
  Trainers : WRD and Zoba staff

- Workshop on "Community management for O&M and water hygiene"
  Benefits: Consensus can be agreed on WRD mandate and plans made for "software" aspects.
  Focus: Planning workshop on all software aspects under WRD/Zoba mandate such as community mobilization and water hygiene.
  For whom: all WRD and ERIWESP staff with selected animators, selected Zoba and ECDF staff.
  Trainers: external facilitators could be useful to enable experience from other nations.

- Baito Training (see following sections)

- Mobilization for low-cost sanitation (see following sections)

- periodic meetings of field staff, every few months, at different Zoba's to review and plan activities, and upgrade on specific topics could be very useful (and allow for field visits to other locations).

4.2 Ministry of Health

The extraordinary effort to put in place a primary health care system throughout the country is remarkable. As happens with such new systems in other countries, outreach from the clinics and health stations needs further development. This is important in relation to preventive measures which usually require health personnel to go to the community (rather than the other way around). The Ministry has developed comprehensive plans and policy guidelines for upgrading staff and putting in place mechanisms meant to activate effectively all aspects of its primary health care approach. At this moment, its manpower capacity may constrain immediate implementation. It is with this in view that one modest activity is suggested which draws upon existing Eritrean experience and current manpower resources. The purpose of this is to activate through inservice and on-site support for personnel in selected health stations to reach out into communities and to train and motivate selected community members. The focus of these activities are preventive health practices including improved hygiene and sanitation.

Hygiene during deliveries could easily be improved through training of TBA's and family members. (Eritrean Health Profile, 95-96, p. 10)

Beginning in 1994, a PHC upgrading pilot activity was undertaken and evaluated by the Catholic Secretariat in Zaghir and surrounding villages (catchment about 11,000 people). This is a promising, low-cost approach based on short-term training of clinic personnel, TBAs, and CHAs during monthly participatory planning and review meetings. Other inputs included some limited supplies from UNICEF and facilitator/supervisor training once a month. In this approach, water and hygiene are part of the package that may include EPI, diarrhoea control, ante-natal care. The approach is particularly interesting as it emphasises group planning, not standardised programming. An impact study was done of the intervention which demonstrated its effectiveness. This was also seen during a field visit. As a potentially useful approach to stimulate and plan community outreach for hygiene, sanitation and other issues, it is recommended that this pilot be extended to carefully selected health stations operated by the government, with the Catholic Secretariat adviser/personnel continuing to supervise and facilitate.

Pilot project on primary health care at Zaghir, Eritrean Catholic Secretariat

The project was set up in the second half of 1994 in 6 villages with a view to improving the effectiveness of primary health care. The purpose, as reported in the evaluation of the project, was to study the best mechanism for implementation of PHC programmes. No quantitative goals were set. A five member PHC committee was set u in each village with five animators(CHAs) or more traditional birth attendants (TBAs). They were trained in two 3-day sessions on PHC subjects. In-service training was provided informally by health station staff during monthly meetings which were attended by one representative of the TBAs and one representative of the CHAs in each village. The monthly meetings were supervised by ERCS Health Department staff. The purpose of the monthly meetings was to train, do joint planning and to motivation of the volunteers. Each group (committee, TBAs, health station) gave a monthly report and discussed problems, ways of solving them and future activities. There were also monthly growth monitoring activities with health education sessions in the villages. Mothers were motivated for ante-natal care, immunisation, growth monitoring, sanitation. successful boreholes were implemented in 4 villages by the Water Resources Department and traditional water sources were repaired.

Reported outcomes and learning's included:
-measurable increase in ante-natal attendance, decrease in reported number of diarrhoea episodes, reported increase in listening to radio broadcasts on health, dramatic increase in immunisations, no adoption of latrines.
-high level of motivation by PHC members, animators and TBAs
-"Communities should...be given the opportunity to define their own needs and should be helped to plan, implement and even evaluate their own programmes."
-"Continuous monitoring and supervision of the programme with the community involved in the process is an absolute necessity to the success of the project ..."

The following suggestions might be considered or adapted:

1. The pilot as done in Zaghir needs some refinement. This could include:
    - paying special attention to training/orientation of the staff in the health station;
    - focusing on the hygiene issues mentioned earlier (rather than on latrines, for example),

- orienting and involving the supervisors of the health station staff;
- trying out the gradual introduction of local purchase of materials such as more soap, dippers, gloves/gauze/razors for TBAs (this could also serve as an income-generation for the volunteers);
- including more hygiene content in the TBA training;
- visiting a small number of households for monitoring purposes during the days of the monthly meetings.

2. Select locations where the health stations have sufficient staff (and they are interested in the pilot activity), sufficient facilities and materials. Villages which are facing drought or several food insecurity should not be selected. Water resources in villages selected should be basically adequate: for example, water should be available in a half hour walk or less for the majority of the houses. Selection of villages where these criteria are not met for a preventive health intervention may doom the activity to failure from the beginning. At least some of the sites should be the same as those where the Water Resources Department is or will be undertaking new activities (such as in Gash-Barka or the proposed pilot programme).
3. A technical and monitoring group from the Ministry of Health and Catholic Secretariat should be set up for the pilot.

Other issues

As safe water supply is essential for health facilities, it is a concern that many health stations lack water supply points. All clinics and health stations in Eritrea should have water and sanitation facilities. The site selection procedures currently used for new facilities are not transparent. Trying to bring water to health facilities after construction is not a satisfactory or least-expensive option.

In general, the quality of pictures used in posters and flipcharts needs to be controlled. This is important because the understanding and perception of pictures by illiterate audiences can be different from the understanding by literate groups. Training is needed for selected personnel in picture/image preparation and protesting. UNICEF, which has pioneered this, beginning with the 1977 study "understanding pictures in Nepal " should be in a position to provide some small training input, particularly for the IEC leader (MOH), who can then WRD/MOH colleagues.

4.3 **Sanitation** (latrines)

Latrines are meant to separate human faecal matter from human contact. However, they will usually only offer a real health advantage if coverage is sufficiently high (a figure of 70% for household latrine coverage is often quoted), if maintenance is good, if the latrines are used by all members of the family, and are associated with hand washing after defecation. Thus latrines represent a range of very new and complex behaviours for the household and community which currently practices open-air defecation.

4.3.1 Community mobilization for low-cost sanitation

Initial latrine programmes have usually failed in most countries because of insufficient community mobilisation, irrelevant or too costly technology, and bad management.

Construction is only half the challenge faced by a successful programme. Motivation, education and management form the other half of the equation. The following may be useful in planning the first such "latrine-with-mobilization" programmes in Eritrea:

1. *Select technology:* This is described in the following section in further detail. For a town such as Keren, it is suggested that two choices be offered: a sanplat with cover for hole, with superstructure to be built by the household and a VIP.

2. Identify the *towns and villages of work* in the country. The rule of the thumb is to begin a latrine-with-mobilization programme in an area where some demand exists. For example, one-fourth to one-third of the households should already be practising some form of localised defecation or already use some form of pit (or other) latrine. It is suggested that this programme begin modestly with, for example, Keren and one smaller town. In general no town or village should be selected if the population is facing severe stress (food security, drought...).

3. The *target* for a latrine-with-mobilisation programme should be determined in advance (for example, 25% to 50% of those without a latrine or with an unsanitary pit latrine). Thus, it is assumed that the programme will not concentrate only on the richer families but will also seek out and serve those at or near the poverty line.

4. *Staffing:* A meaningful first latrine programme can not be managed and executed by one or two people. These programmes usually employ temporary workers on a short-term contract or piece-work basis. Within the Ministry of Health, a *senior staff member* is needed who has extensive experience in working with communities or is a specialist in community mobilisation. Previous technical expertise is less important for on-site sanitation programmes.

5. Undertake the programme on an *area-by-area basis*. Programmes are usually localised, moving systematically from one neighbourhood to another. This makes communication and education activities more efficient, reduces transport costs, and makes supervision of workers more effective.

6. During the *mobilization phase*, (a) construct demonstration latrines and (b) form and train the main local organising groups. For example, in villages, a committee (perhaps an existing water committee) on which a member of the local administration sits, could be the local organising committee for each 100 households. In towns where it may be more difficult to form committees, the Youth Union and/or Women's Union might be engaged with a members working (for a stipend) with each of 100 or 200 households.

7. *Costing and payment*: Preliminary data coming from the ERIWESP willingness-to-pay study, seemed to indicate that payment in cash from low-income families should be about 50 Birr to 75 Birr plus support for construction in the sanplat model, and about 800 Birr for the simplified VIP model. The subsidy required would hopefully be a maximum of 150 to 200 Birr for the sanplat. This is calculated on the basis of 25 Birr for cubic meter of digging plus the same for square meter of lining using country-baked or natural bricks at a fairly shallow depth of 2 1/2 meters. To reduce subsidies, the first meter or meter-and-a-half could be excavated by the home owner. Household subsidy usually is reduced during 'second rounds' of work in the same neighbourhood. For the VIP, an improved version of

the model built in Keren might be tried, giving a 200 to 300 Birr subsidy. The householder's payment and purchase is usually most successful if done before construction, during the phase of mobilization. Local outlets for platforms and transport of platforms and commodities to site should be organized to be used by the householder or committee.

8. The length of the mobilization period, that is, the period before construction is usually *4 to 9 months* in most projects. For the first areas or neighbourhoods of about 100 or 200 houses each, the mobilization will be slow, for example a minimum of 6 months. If the programme is well-managed and begins to have an established name, then mobilisation always goes faster in subsequent areas. Thus, it is important to have tight, honest and caring management from the beginning, which implies quite a lot of labour input at first.

9. *Motivation* is needed through all channels (health clinics, hospital, CHAs, Youth Union, local government, vendors, religious groups, Women's Associations). When, as in Keren, the programme is accompanied by a school latrine programme, then children can also inform their families, or participate in other ways. Motivation and payment of money, if any, is needed at the right time with respect to the rains so that construction can take place during the dry season. Motivation and campaigns usually begin, in the more successful programmes, with some audience research, no matter how rudimentary. For this the target groups are usually segmented or separated (renter and owners, men who are heads of families, mature women, younger women, for example). For those who have sanitary latrines, and then pit latrines, certain questions can be asked: Why did they decide to have the latrine? How much did it cost to make or how long did it take to make it? Does everyone use it? How old is it? Are they satisfied with it? The answers to such questions are very useful for motivation activities which are focused on that age and target group. Ideas about construction will also appear.

10. A *contract* should be done with local authorities or implementing groups after the first couple of areas are completed. This will enable the programme to refine its strategy for the programme, technology and education/mobilisation. It will also enable it to establish credibility so that local government and potential implementing groups **want** to enter into a contractual relationship. Such contracts usually stipulate the responsibilities of each party and, if possible, indicate the contribution in staff, materials and/or money from the local government and implementing groups.

    Training in social marketing techniques, including audience segmentation, would be very useful. It is suggest that trainees include members of the IEC technical committee, radio, and at least one sanitation person who is experienced in working with communities.

4.3.2 *Technical Aspects*

In Eritrea, there have already been some problems encountered with the expense and technical complexity of the VIP (ventilated improved pit) latrine. Some observations made by sanitarians and others were: the VIP is dark and not convenient; the 'Sudan' design is not bad but uses lots of wood; some people think the VIP is for urination only or only for sick people. Observations during the field trips showed, indeed, that VIPs and other latrines in rural areas are used by the sick, the handicapped, mothers who have just given birth, and are built by people who have returned from other countries. In other words, the latrine may be associated

with 'special cases'. Furthermore, the VIP is very expensive (1000 Birr to 2500 Birr have been mentioned).

Thus, a step-by-step approach is suggested for launching household sanitation which builds on demand and affordability of potential user groups. The steps increase in cost and complexity:

1) *Remove animals* from sleeping areas and fresh excreta from household compounds (highlands) and some lowland areas. This could be a feature of the proposed health station management out-reach programme, school education and feature as a content in the Water and Sanitation Committee/Community orientation. Research may be very useful. For example, it would be useful to visit highland villages, to develop and try out with villagers some practical and low-cost ideas to remove animals or fresh animal excreta from contact with humans in the household. Strategies might be simple (such as pushing fresh excreta to the corner of the compound in each morning and putting a small woven 'cover' over chickens) or more complex (such as some type of construction). The time required for such research might be about 2 months and involvement of an anthropologist may be useful.

2) *Dig-and-bury human faeces* including that of children. Defecate away from the house and bury faeces each time. This is sometimes a first step in environmental sanitation programmes involving sensitising people to the nuisance and danger of human faecal matter, and the great power of flies in spreading disease. Attention is needed to communicate the point that human faecal matter is more dangerous to humans than that of cows, camels or donkeys (the same may not hold true for excreta of chickens and pigs). Digging is usually done at the time of defecation with anything that is handy such as a stick. The hole should, of course, be as deep as possible; however, this is not always feasible. Before launching any activities related to this, a mobilization programme should be tried out on a small scale. This might include asking a group about the issue in general, then providing some health information and then asking about the idea.

3. *Pit with sanplat and hole cover* against flies. Initial locations should be areas where there are already some pit latrines in use (for example, Keren, a small town, a crowded village). As a rule of the thumb (and this should be checked by asking in an area) when about one-fourth of the households start using something like a pit latrine or a more sophisticated facility, then sufficient demand has been built to launch a major campaign. Care must be taken regarding the use of latrines by all members of the household (one or more latrines for daughters-in-laws, men and women and so on). Programmes that have overlooked this feature find that use of the latrine is limited in the family. Users are generally targeted who practice open air defecation or have rudimentary pits. Cost should be kept low so that renters have access. In many programmes in Africa, the cost of digging, lining the pit and the superstructure are for the household, while the platform is subsidised. An interesting variation might be to subsidise the digging and lining but sell the sanplat (or have it purchased in local shops but with quality control on manufacture). The benefit of this could be the privatisation of the platform sales. Cost should be kept low. The sanplat may cost about 50 to 60 Birr, while pit digging and lining is much higher. One way to reduce cost if there is a substantial campaign is to pay those who dig and line pits by piece-work rather than by the hour.

   Technically, the pit lining, depth and support for the sanplat can be problems. Partial lining or shallower pits (2 meters) might be an option, particularly since the sanplat can be moved.

For moving, lift-rings could perhaps be built in. In addition there is no capacity to make a sanplat without a wooden substructure in Eritrea at this time. A consultant is needed for this.

4. *Pit latrine with sanplat, cover and vent pipe.* This is a low-cost VIP without the superstructure. Sometimes the hole covers are not used: they can be too heavy, get dirty or the handles can break. This should (also for the preceding option) be checked. The cost of this model is more than the preceding. It may (or may not) prove to be a viable option.

5. *VIP latrine* will, given the cost of above 1000 Birr, only be for those who can pay. The double-pit version which was built experimentally in Keren may be viable. It requires water and needs a smooth platform. For some reason, this latrine and two others seen during this visit have holes that are either too small or incorrectly placed to be used by women. None of these latrines appeared to have been used. It is very important that masons who make latrines, and people who design them also have the experience of using them.

5. Water closet (with septic tank or city sewerage). It is very helpful to have plans available, with costing, as a public service when new waste water and sewerage systems come, as is apparently planned in Keren. This may save the home owner money and improve the quality of construction.

College of Public Health

The College's profile of the environmental health technician has objectives which fit well with the type of latrine-with-education programme described here. However, the profile itself does not quite seem to match the objectives of the programme. The profile has four substantive sections, parts of the curriculum for training. Most of the items are technical or urban in orientation. There are no contents related to skills needed for working with communities or villages, to participatory skills, community organisation and mobilisation.

4.4 Ministry of Education

In the rural schools visited there was no water and therefore children were not allowed to use the latrines where these existed. As with health stations, schools need water. It is strongly suggested that site selection procedures take this into account. The appropriate use and cleaning of a school latrine requires water but also training for children as well as teachers.

The MOE is launching a small experiment on integrated environmental education through school clubs. This may have potential for child-to-child activities (older children teach or supervise the younger), for improved school and personal hygiene, among others. It would be very useful if this initiative were targeted to at least a few schools located where there are new water sources coming or other interventions mentioned earlier. It may also be useful to prepare a proposal in the near future for the refinement and implementation of the environmental clubs which should, in part, be targeted to hygienic use of latrines and hand-washing.

There is considerable experience in school environmental, agricultural co-curricular activities and health clubs in other countries. Interestingly the best of these have a planned programme of annual or semi-annual teacher training and joint lesson activity planning. Several such

school programmes (in southern India, East Malaysia, parts of Kenya) have failed because the necessary inputs were lacking (water near the school, materials, trained teachers, orientation of supervisors and head teachers) and periodic on-site supervision and support were not provided.

With respect to the use of latrines, most schools, quite naturally, follow the cultural patterns of the areas in which they operate. For economic reasons, most schools give the pupils no chance to clean themselves except with little scraps of notebook paper. It is easiest and cleanest if all students use water for anal cleaning with a cup in the toilet (and bucket of water nearby). This does, however, present other logistics problems (how to store the cup and bucket, for example).

With respect to adult education, post-literacy booklets are being prepared which include relevant topics. Specific booklets about latrines and latrine construction might be useful in towns and urban areas.

4.5 Women's Union and Youth Union

The Women's Union and Youth Union have been mentioned earlier in the context of (a) membership on water committees and (b) mobilisation for low-cost sanitation.

The Women's Union is currently implementing a small Family Life Education programme which relies on training voluntary trainers who return to their locations after an extended workshop. The programme is being assessed at the end of 1996 during time which issues may be dealt with such as incentive payments for the volunteer trainers and follow-up support at the field level. This activity is deserving of further support: it is one practical and realistic vehicle for hygiene promotion, among other things.

It might be worthwhile for the Women's Union and donors to consider additional programming strategies relevant to water, hygiene and sanitation which have been undertaken in some other countries. These include: mixing skills/income training and health/hygiene issues such as selling dippers for water storage. Another small experiment might be to provide loans for traditional water sources with monthly playback from user families (carried out on a small scale in Thailand). In India, members of the local Unions have, for payment, undertaken the monitoring of latrines which were newly constructed (one month, six months and one year) after construction. This stimulated good maintenance and also identified technical problems. Also in India women have been trained in some projects as masons for latrine construction work, making a good income.

Youth Unions have been very successfully involved in sanitation activities in a number of countries. During latrine campaigns, there is usually financial support needed for mobilising communities before construction and later, during the construction period.

4.6 *Eritrean Community Development Fund*

It is recommended that site selection procedures be improved for health and educational facilities with a view to ensuring their water supply. Clinics without water will not be successful and at a certain moment will necessitate a large capital investments.

Certain training programmes which were suggested earlier for staff of the WRD could also usefully be made available to Zonal ECDF personnel. In addition, links between ECDF and the proposed pilot activities of the WRD could assist both groups in ensuring good implementation while enriching field-based ECDF staff in software aspects of rural water supply.

The design of some ECDF-constructed latrines may need follow-up. Those seen at two health stations had too many cabins and small holes which were too small to be used. The experience in other countries where latrines are relatively new is that those constructing the latrines may not be familiar with the facility.

4.7 Local Government and National Collaboration

4.7.1 Zoba

At the Zoba level, water is in the Infrastructure Development Department, while health and education are within the Social Service Department. Efficient co-ordination at the Zoba level between the two departments can be useful, for example, in mobilising health or education staff when a new water point is coming to a community. Further, the various activities described above (related to water committees, schools, health stations) will have a much greater impact if co-ordinated, for example, being implemented in a village at the same time. Thus, the upgrading of a water point and mobilisation of the outreach from a health station can help ensure that the new water is used for drinking and that the source is maintained. The outreach from the health station can reinforce the work with the water committee. This over-lapping is an intended consequence of the model described in chapter 2 of this report.

In Mr. Koehn's consultancy paper on decentralisation, an excellent point was made regarding capacity building within the baito to enhance the planning mechanisms being put in place at the local level. It was noted: "*Along with the training sessions, all baito members should be exposed to regular education sessions offered by national and international experts on development issues such as population growth and control, the impact of female education, child survival and development, the importance of environmental sanitation and basic preventive health care principles.*" (Koehn, p. 14.) It is hoped that the WRD staff can assist Zoba staff with such exercises.

Similarly, for the Zoba personnel, further training opportunities are required. If, for reasons of language competence Zoba personnel can not participate in current training programmes being offered in other countries, one option would be to include translators to assist participants during the visits. Another option would be to 'import' and adapt such training programmes to suit local circumstances. Within the water and sanitation sector, such short-term training programmes that exist within and outside the region include training on management of water resources, monitoring and evaluation, management for sustainability, low-cost sanitation, health promotion.

4.7.2 Inter-ministerial and inter-agency collaboration

The ERIWESP project noted: "*The development of WES services should be designed, managed and evaluated in an integrated manner, consistent with community decision-making prerogatives, in the following areas:*

-water and sanitation...

-multisectoral co-ordination and collaboration at all levels.

-the co-ordinated involvement of all stakeholders." (p. 13 ERIWESP)

In the water and sanitation sector in many countries, effective collaboration among ministries and ESA's has been difficult to achieve. Collaboration is usually easier within local government and, of course, at the village level. Co-ordination works best when it is targeted to specific and concrete tasks.

Consideration may be given to three mechanisms for collaboration:

A) - **expanding the role of the current technical committee for IEC under the Ministry of Health**

In addition to monitoring materials for technical quality, three other aspects might be included in the committee's mandate : Preparation and pretesting of pictorial images, the relevance of the materials, and basic research methods for social marketing. Some preparation and training would be needed for both as has described earlier.

B) - **establishment of a programme co-ordination unit within the Water Resources Department**

This option is dealt with in greater detail by Ms. A. Dias, institutional consultant to ERIWESP. The proposed unit would be composed of representatives of relevant governmental departments and would, hopefully constitute temporary committees for, among others, water hygiene and community organization. The Unit could help organize professional and programming resources in support of WRD activities.

C) - **a technical (and social) committee for low-cost sanitation** should be constituted. The committee could include as permanent members: MOH sanitarian staff, head of IEC in the Ministry of Health, a representative from the new Division of Research and Training (Ministry of Land, Water and Environment); a representative from the WRD. As temporary members, the committee could invite representatives of all those agencies and groups which are involved in planning and implementing low-cost sanitation, including NGOs. In new efforts, the most innovative programming on low-cost sanitation usually develops first in the non-governmental sector. The Government sector is effective at application, refining and disseminating tested approaches. However, where so little has been done and so little is known, highly flexible pilots and experimental activities are first needed. Thus, this technical and social committee should be composed of representatives of groups such as NGOs which are directly involved in executing programmes in on-site sanitation. It is suggested that the committee not develop guidelines for technology or implementation until actual field experience has demonstrated that certain approaches have been proven to be effective in Eritrea. There may be one exception to this, however. It may be useful to recommend that on-site sanitation be developed with a

strong element of education/mobilisation and that the user or beneficiary of a subsidy also must contribute (in other words, no free latrines). Thus the mandate of this committee would include:

(a) Collaborating on and disseminating the results of the study on low-cost and acceptable approaches to separating animal/faecal matter from inside and near dwellings in highland villages, in which an anthropologist might take part.

(b) Stimulating training and sharing of experience on low-cost latrine - with - mobilization pilot activities.

(c) Participating in study visits and assessments of Eritrean programmes.

(d) Providing a forum for information - sharing.

(e) at a later date, preparing a major national high coverage programme for low-cost sanitation.

It would also be helpful if UNICEF could continue to facilitate learning's among its projects and others (Acord & Keren sanitation). This may be equally useful with other UN agencies as, for example, when another organisation has a consultant whose input, even if very brief, could be useful to various Eritrean groups. An example of this may be in the area of social marketing and testing of materials for which UNFPA is noted.

4.8 IEC (information, Education and Communication)

It is suggested that a workshop be organised by the IEC technical committee to investigate themes related to hygiene and, at a later date, on-site sanitation (latrines). Workshops to develop themes for different language groups have already been held in relation to other subject areas.

Posters and materials for the social animators should be tested. In addition, some training or action research should be initiated for this, drawing perhaps on the methods developed in the famous UNICEF study "Understanding pictures in Nepal", mentioned earlier. An example of the results of such testing can be seen in the UNFPA-supported posters prepared with the Ministry of Labour and Human Welfare. It would have been useful if the consultants who organized the testing of these posters had also provided a short workshop for the members of the IEC Working Group.

In preparation for activities related to social mobilisation which were mentioned earlier, it would be useful to provide training opportunities to selected members form the IEC Working Group and the radio to examine practical methods of audience research and segmentation relevant to social marketing from a development perspective. The possibility for segmentation of audiences is implied in this observation from an article in the Eritrean Review with respect to a highland village: *"When the men sit and listen to the radio, the women are either busy preparing food or collection firewood... the radio is a specifically male possession. ... Women do not listen to the radio as they go about their daily work, as men often do when sitting in the compound..."* (p. 29, Eritrean Review) One possible implication of such findings

would, for example, be the development of hygiene and sanitation programme items which are geared specifically to motivating men.

4.9 Training and capacity building

"On HRD issues, the workshop was struck by the gap which exists between the current pool of human resources (numbers, skills and experiences) and the minimum requirements which need to be satisfied for effective functioning of the rural WES sector. (p. 3 ERIWESP).

This paper has emphasised capacity building through small-scale trials, demonstration activities and training. Several training possibilities have been mentioned. High quality and relevant training will probably be used to good effect in Eritrea, implying that training is cost-effective in the long run. The items mentioned included:

- ◊ Logical Framework Analysis, problem and objective trees,
- ◊ participatory methods and ways of working with communities
- ◊ training and orientation for water and sanitation committees
- ◊ O&M including repair of handpumps and maintenance of motorised pumps (animators)
- ◊ baito orientation and training related to water, hygiene and sanitation
- ◊ hygiene promotion
- ◊ teacher training for management of school sanitation and health clubs
- ◊ social marketing skills, materials testing and picture development
- ◊ training in sanplat construction
- ◊ low-cost sanitation (training and planning workshop, for example)

"Eritrea should seek opportunities for collaboration with specialised training institutions like NETWAS and others (p. 16, ERIWESP) As has been mentioned earlier, it would be extremely useful to build national a training-of-trainers capacity beginning, for example, by 'co-training' with trainers from outside Eritrea working with local counterparts as has been done in many other organisations in other nations. However, this gap remains unaddressed. and there remains a great need for one or more Eritrean professional groups that can provide, or be helped to provide, inputs of high quality for participatory training, management and research.

Selected translations of the materials relevant to hygiene, water and environmental sanitation are urgently needed. This is particularly relevant with the current move toward decentralisation.

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Water Resources Department, "Report of the first ERIWESP Planning and Programming workshop, 16 - 20 April 1996". May 1996, Asmara. 54 pp

Appendix 2 Summary of findings from KAP study, 1995/6

Nyamwaya, David et al. *Report on knowledge, attitude and practice study relating to water, sanitation and control of diarrhoeal diseases in Eritrea.* Water Resources Department and UNICEF, June 1996, Asmara. 169 pages.
Recommendations, Conclusions and Findings, sclected detailed notes

CONCLUSIONS AND FINDINGS

Research in 80 villages. 90% respondents were women.

1. DIARRHOEAL DISEASES

- More than 1 in 4 indicted hat their children had diarrhoea in previous 2 weeks (that implies 6 episodes a year per child)
- Breastfeeding seem to decrease with higher parity (later born)
- Most respondents did not know preventive measures for CDD (clean water, safe disposal of faeces, handwashing, fresh/well cooked food.

2. ORAL REHYDRATION

- Only half of respondents could demonstrate how to prepare ORS.
- Use of ORS or SSS (sugar salt solution) is low (15% respondents)

3. WATER HYGIENE

- Where government provided well, all villagers believe that repairs/maintenance are government's responsibility.
- 3/4 respondents know that sharing water with animals will make it dirty/unsafe.
- There is strong demand for greater quantity, not better quality water.
- Open wells, rivers and streams are the most frequently used sources. Water quality is poor.
- Water hygiene at source and home not good 'dirty jerrycans, dirty covers, one cup dipping, dirty funnels, surroundings of source soggy with animal droppings.
- Several villages protect water sources to reduce animal pollution.
- Very little idea of handwashing. No idea of handwashing before breastfeeding.
- Average of 9 lpcd means there is little health advantage from water.

4. ENVIRONMENTAL SANITATION

- Children's stools were scattered overliving compounds in many villages. Adults defecate away from houses.
- >90% practice open air defecation. reasons include: (a) plenty of open space, (b) limited water means latrines will get dirty, c) not know how to construct, d) not common in Eritrea, e) no national programme, f) people are too poor and have other priorities food and g) nomadic people find latrines irrelevant.

- People seem concerned about environmental hygiene. They wanted to know more. There is very little link between knowledge of latrine use and health.
- In several villages, animals and people share dwellings.

5. OTHER

- Respondents had positive attitude to paying for water, although felt that tariffs (especially trucks) were high. Sense of ownership less for more complicated technology which villagers can't repair.
- Many/most handpumps were not working.

RECOMMENDATIONS: POLICY, PROGRAMMES, OPERATIONS

1. COLLABORATION
   - 1.1- Inter-ministerial policy needed
   - 1.2 organizational and structural linkages needed on water, sanitation, control of diarrhoeal disease (CDD)
   - 1.3 coordination & monitoring committees at national, provincial, sub-provincial levels
   - 1.4 coordinate among projects especially on educational materials
   - 1.5 social mobilization and advocacy (Kamchiwa)

2. TRAINING AND CAPACITY BUILDING
   - 2.1 infuse other programmes with contents of WES and CDD
   - 2.2 update all health workers
   - 2.3 hygiene education should be more participatory, not top-down
   - 2.4 infuse all service providers with contents on water use

3. HEALTH EDUCATION
   - 3.1 more emphasis needed on health education programmes
   - 3.2 implement school health with school sanitation and water facilities

4. CONTROL OF DIARRHOEAL DISEASES
   - 4.1 effective & integrated CDD programme needed
   - 4.2 test local preparations for diarrhoeal diseases
   - 4.3 ORT/SSS fluids and supplementary feeding needs to be promoted
   - 4.4 need greater actual use of ORT and SSS
   - 4.5 need national mobilization on CDD

5. WATER
   - 5.1 far greater emphasis on provision of improved water supplies
   - 5.2 water committees organized and trained to manage water points
   - 5.3 O&M and spare parts system urgently needed for sustained functioning
   - 5.4 greater government role in providing materials not locally attainable; community to provide labour and local materials
   - 5.5 MIS system the information from which is used at the lowest level
   - 5.6 improve water use & water hygiene

6. ENVIRONMENTAL SANITATION

6.1 implement national rural sanitation programme

6.2 have joint government/community contributions for facilities

7. OTHER

7.1 assess rural poverty

Appendix 3 Domain of hygiene behaviours, practices

From: Boot, Marieke and Sandy Cairncross, editors. *Actions speak: the study of hygiene behaviour in water and sanitation projects.* IRC International Water and Sanitation Centre and London School of Hygiene and Tropical Medicine, The Hague. 1993. 139 pages.

Overview of main behaviours in the five behavioural domains

A: Disposal of human faeces

- choice of place for defecation
- disposal of faeces
- anal cleansing
- disposal of cleansing material
- handwashing
- cleaning of the toilet/latrine
- maintenance of the toilet/latrine
- other activities related to faecal matter
  - use of faeces as fertilizer
  - use of faeces for fish production
  - animals eating faeces

B: Use and protection of water sources

- choice of water source
- water collection
- water transport
- water use at the source
- wastewater disposal and drainage
- water treatment
- water source protection and maintenance
- other activities related to water source
  - water conservation by prevention of water pollution
  - water conservation by prevention of ecological degradation

C. Water and personal hygiene

- water hygiene in the home
  - water handling
  - water storage
  - water treatment
  - water re-use
  - wastewater disposal
- personal hygiene
  - washing of hands/cleaning of nails
  - washing of face
  - body wash/bathing
  - hygiene after defecation
  - washing and use of clothes, towels and bedding
- personal hygiene during natural events, such as menstruation, birth, death, illness

D. Food hygiene

- handling practices
  - cleaning of kitchen/food preparation area
  - handwashing/use of clean hands
  - use of clean work-top and kitchen utensils
  - use of clean dishcloths/kitchen towels
  - use of safe water
  - disposal of wastewater and garbage
- preparation practices
  - washing of raw food and fruits
  - temperature/length of cooking
  - temperature/length of re-heating
  - speed of cooling
  - time of preparation
- storage practices
  - temperature/length of storage
  - location and coverage of stored food
  - storage of left-overs
  - storage of eating/kitchen utensils
- eating and feeding practices
  - handwashing/use of clean hands
  - use of clean eating utensils
  - feeding of babies and small children
  - times of eating and feeding
  - washing of eating/kitchen utensils

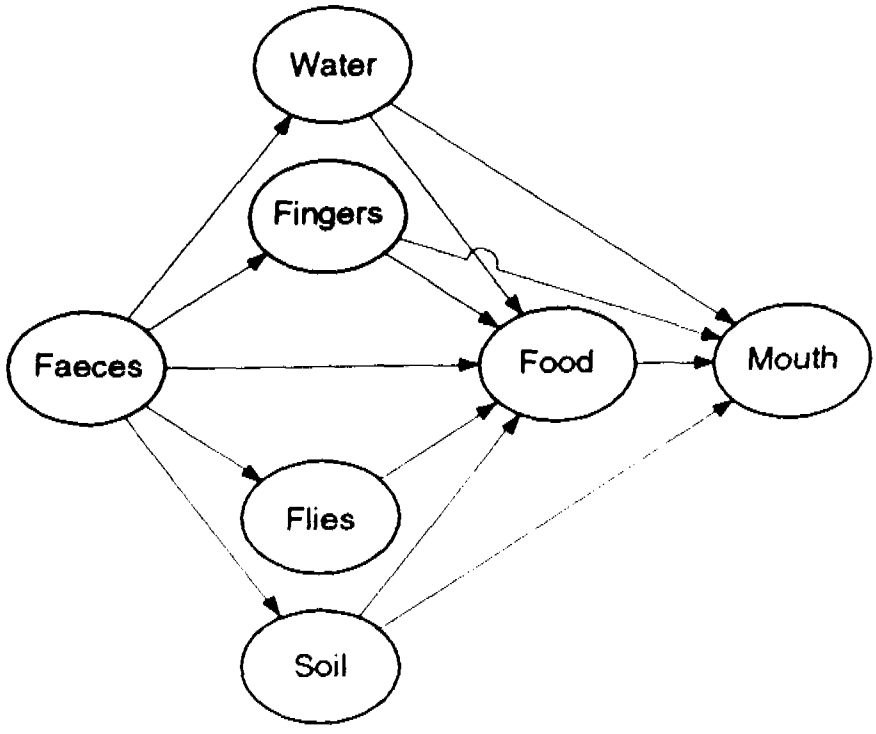
E. Domestic and environmental hygiene

- household hygiene
  - wiping of surfaces
  - sweeping and cleaning of floors/compounds
  - removal of shoes before entering the house
  - cleaning of children's play objects
  - insect control
- environmental hygiene
  - street cleanliness
  - wastewater disposal & drainage
  - solid waste disposal
  - hygiene at public places

animal management

- control of animals
- safe disposal of animal faeces

Appendix 4 Interventions breaking faecal-oral infections



Faecal-oral transmission routes.

Table : 1
Impact of the promotion of personal and domestic hygiene on diarrhoeal morbidity
(Huttly S, 1992)

Location	% Reduction in diarrhoeal morbidity	Reference
Handwashing		
Burma	30	Hand & Hlaing
USA	48	Black et al.
Bangladesh (Urban)	35*	Khan
Combination		
Bangladesh (Urban)	26	Stanton & Clemens
Bangladesh (Rural)	>40**	Alam et al.
Guatemala	14	Torun
Zaire	11	Haggerty et al.

* Impact on Shigellosis

** Impact seen in both intervention and control areas : reduction due to intervention is approximately 17 %

Appendix 5 Contamination of water sources

The following excerpts are taken from: Cairncross, Sandy and Richard G. Feachem. *Environmental health engineering in the tropics: an introductory text.* John Wiley & sons, Great Britain, 1983. 283 pages.

Some Reported Concentrations of Faecal Coliforms in Untreated Domestic Water Sources in Developing Countries

Source	*Escherichia coli* per 100 ml[a]
Gambia	
Open, hand-dug wells, 15–18 m deep	Up to 100 000
Indonesia:	
Canals in central Jakarta	3100–3100 000
Kenya:	
Springs	0
Dam	0–2
Waterhole	11–350
Large river	10–100 000
Lesotho:	
Unprotected springs	900
Waterholes	860
Small dams	260
Streams	5000
Protected springs	200
Tap water (springs)	9
Tap water (boreholes)	1
Nigeria	
Ponds	1300–1900
Open hand-dug wells,	200–580
Tap water (borehole)	Up to 35
Nigeria	
Ponds	4000 000[b]
Open hand-dug wells	
to 12 m deep	50 000[b]
Stored in home	100[b]
Papua New Guinea	
Streams	[illegible]
Tanzania	
Rain water	[illegible]
Waterholes	[illegible]
Ponds	[illegible]
Springs	[illegible]
[illegible]	[illegible]
Protected springs	[illegible]
Open wells	[illegible]
Protected wells	[illegible]
Boreholes	[illegible]
Treated tap water	[illegible]
Uganda	
Rivers	[illegible]
Streams	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
Hand-dug wells	[illegible]
Boreholes	[illegible]

[illegible] where a range is given it is a geometric mean

[illegible] thermotolerant rather than faecal coliforms

[illegible] are not necessarily typical of the domestic water quality in the countries concerned. They are measurements taken from selected sources [illegible] to illustrate the magnitudes. It is generally true, however, that people in [illegible] sources of open wells [illegible]

[illegible] Reproduced by permission of the Lancet

Microbiological standards

When considering a chlorinated and treated water supply the question of standards is a relatively straightforward one. The presence of even very low concentrations of coliforms is indicative of a failure in the treatment plant or subsequent pollution of the treated water. Therefore standards are typically very rigorous. The World Health Organization (WHO, 1971) suggest the following standards for treated drinking water:

(i) water entering the distribution system should contain no coliform organisms;
(ii) water at the tap should contain no coliforms in 95 per cent of samples taken in any one year and it should never contain more than 10 coliforms/100 ml or any *Escherichia coli*.

For untreated water supplies, and particularly for the water supplies of rural people in the tropics, the question of standards is much more difficult. Untreated water sources are almost invariably contaminated with faecal matter and contain faecal coliforms and other indicator bacteria. It is therefore more important to determine the concentration of indicator bacteria in a sample of water than simply to demonstrate their presence. Table 3.1 gives some typical values. In general, surface-water sources may be expected to be substantially polluted in any area with significant human or animal populations, whereas groundwater sources will often be of better quality. However, it would be almost inconceivable to find *any* untreated water supply in *any* village in *any* developing country in which one could not detect faecal coliforms and other faecal bacteria. Therefore, to apply standards as stringent as those laid down above would be to condemn the water supplies used by the great majority of the population of most developing countries.[1]

At the best, such a ruling will simply be ignored and thus bring similar regulations into disrepute: at the worst it may force people to abandon improved but lightly contaminated supplies in favour of the only alternative, which may be unimproved and heavily polluted sources of water. For example, there have been cases where overzealous health officials have closed down shallow tube wells because they were found to contain 50 faecal coliforms/100 ml and have thus forced villagers to use polluted irrigation canals containing 10^4 faecal coliforms/100 ml.

A useful role for bacteriological water quality testing in villages using untreated water supplies is to select between alternative sources of water. If a number of alternative sources are tested, it is possible to determine which consistently provides water of the best bacteriological quality — particularly after rain. This source may be used in any improvement or extension of the supply. If the improvement includes improved protection to the source, such as a well cap or spring box (see Chapter 5), this should considerably improve the quality of the water.

After a supply has been built, it requires regular monitoring. In the United Kingdom it is recommended that water from supplies serving less than 10,000 people should be tested weekly, and larger supplies daily. Few developing countries could attain this frequency, and the intensity of monitoring must be chosen to suit the resources and manpower available (WHO, 1976). Samples should preferably be taken several times a year for testing, certainly from supplies serving over 1000 people. An increase in the level of pollution in a particular supply, or a much higher level than found in other, similar supplies, is suggestive of a technical fault allowing undesirable contamination of the water.

A rather different use of bacteriological water testing is in the investigation of outbreaks of potentially water-borne disease. If an outbreak of a potentially water-borne disease (Table 1.2, Category 1) occurs, then it is appropriate to test for faecal bacteria in the various water supplies in the area where the outbreak occurred. This may well help the health authorities by showing whether or not there is a source of water which is substantially contaminated by faeces. In such an investigation, one is interested in finding levels of faecal pollution that are substantially above the general norm for that area. Simply to find a few faecal coliforms in the water supply of a village which has had an outbreak of typhoid is in no way a demonstration that the typhoid outbreak was water-borne.

In conclusion, it is necessary to exercise a good deal of common sense in the use and interpretation of bacteriological water quality standards for untreated waters in developing countries. Standards or goals should be set realistically and national authorities must decide themselves what are reasonable levels to aim for, given the particular environmental and economic circumstances of the country. Bacteriological water testing is expensive and should only be undertaken when practical decisions can be taken on the basis of the results

[1] The reader should note that WHO (1971) do suggest standards for untreated water supplies — namely less than 10 coliforms and no *Escherichia coli* 100 ml. We believe that these standards are too stringent to be helpful in most circumstances; many water supplies used by small communities and farms in the upland areas of the United Kingdom do not conform to them. We understand that more flexible standards will be proposed in the forthcoming WHO *Guidelines for Drinking Water Quality*.

Appendix 6 Sample checklists

Box 13: Dynamic Household Score Index in Nepal

UNICEF-Nepal started in 1989 to train village women volunteers to maintain their water systems and to promote sanitation. Two female sanitation fieldworkers visited all households to introduce the programme and to observe specific indicators of sanitary habits. This data was collected at the beginning, before project activities began. Positive answers to each of the observations were rewarded by one point. Volunteers were trained for every tapstand in the village. They also assisted the fieldworkers in organizing meetings or visiting houses on an informal basis and to talk about water and sanitation related diseases, to motivate villagers to build latrines, etc. When visiting the houses, indicators shown below were observed again. Scores in each area should improve over the duration of the programme. Where scores did not improve, new motivation or teaching techniques needed to be developed. Using this technique, both staff and volunteers were motivated with a sense of responsibility for improvement. Providing that information is shared, the whole community can become involved. The survey will be repeated after the project has been completed (Morgan, 1992:9-11, partly op cit.).

Dynamic household Score Index.
Project name . . . . . name of householder . . . . . .

Date . . . . . family size . . . . . .

Award positive observations or responses with one point.

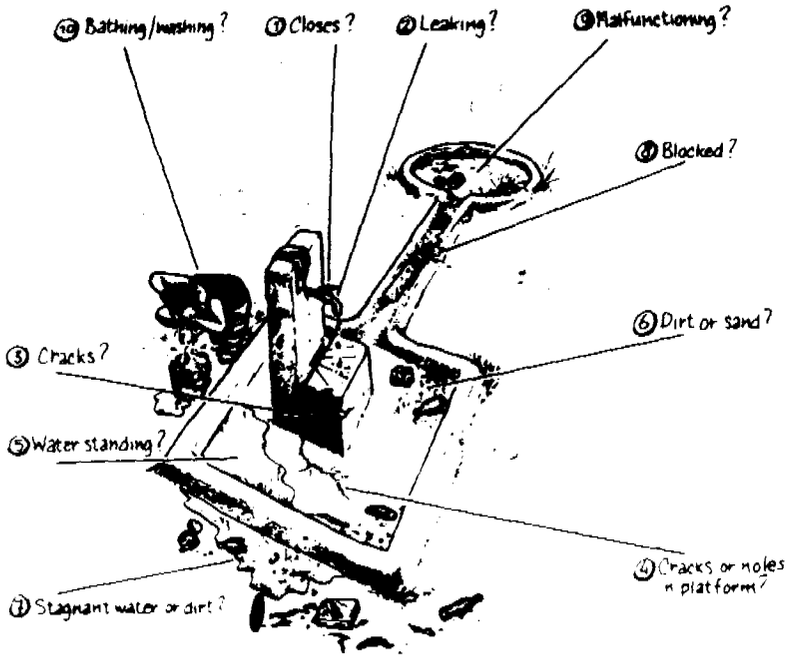
1. Do members of the household use one area for defecation?
2. Is this a sanitary latrine (one where flies are denied access to excreta)
3. Is the latrine slab dry, without faecal matter?
4. Is there anal cleansing material available in the latrine?
5. Do household members say that they wash their hands with soap or ash after defecation?
6. Do the insides of water containers look have dirt or solid matter?
7. Are water storage containers kept covered?
8. Is cooked food kept covered and thoroughly re-heated before consumption?
9. Is there a compost pit which looking used over the past 2 days?
10. Is the tapstand in working order?
11. Do tapstand surroundings have garbage or muddy water?
12. Does woman say waste-water is re-used for irrigation?
13. Can a member of the household recite the correct recipe for oral rehydration solution?
14. Can a member of the household name the correct day in the month when immunizations are given at the health post (or more locally)?
15. Do each of the children in the household have a current immunization record card?
16. Has the household shown interest in sanitation by other initiatives?
    ie a table for drying plates,
    clothes line in the sun,
    shower room,
    smokeless stove

Total the points to give to Dynamic Household Score Index:

Figure ?: Sample pump site score card from Zambia (PSCC)

1.	Is it impossible to close the tap?	y/n
2.	Is the tap leaking?	y/n
3.	Are there any cracks on the standpost?	y/n
4.	Are there any cracks or holes on the apron?	y/n
5.	Is water collecting on the apron?	y/n
6.	Is there dirt or sand accumulating on the apron?	y/n
7.	Is there any stagnant water or dirt around the apron?	y/n
8.	Is the drainage channel blocked?	y/n
9.	Is the soakaway system malfunctioning?	y/n
10.	Are there people bathing/washing near or on the standpost?	y/n
11.	Is the number of people seen at the platform at the time of monitoring more than eight?	y/n

TOTAL SCORE NO .....



: Observation sheet to observe sanitary conditions at the well-site

The following form has been both used by project extension staff and village health workers regarding sanitary conditions at the well-site. The results are used as a basis for discussion with other villagers and as a source of information to be processed and interpreted by the extension staff members to review progress of their programme (WADS project, 1989). This form has several **weaknesses**. The words **good, medium, much, mostly, clean, poor etc** are subjective leading to unreliable reporting. For example, one observer might find a fence to be in 'medium' condition, while another observer could think the same fence is in 'poor' condition. The form should be redesigned or be made precise by additional specification. for example, instead of clean latrines, one could state: no excreta of smears of excreta seen in pan, on floor and walls.

SANITARY CONDITIONS AT THE WELL-SITE

VILLAGE: VILLAGE COUNCIL: DATE:

RURAL COUNCIL: NAME EXT. WORKER: HYGIENE:

0) Waterlevel and time it was taken (preferably before 7 am. or at 4 pm.: ☐ waterlevel ☐ time

I

1) Fence: ☐ present ☐ not present

2) Fence condition: ☐ good ☐ medium ☐ bad

3) Animals within fence ☐ none ☐ few ☐ much

4) Laundry within fence ☐ no ☐ yes

5) Gate present ☐ no ☐ yes

6) Faeca. deposits within fence: ☐ no ☐ few ☐ much

II

7) Sand on the slab ☐ no ☐ little ☐ much

8) Water on the slab ☐ no ☐ little ☐ much

9) Dirt on the slab ☐ no ☐ little ☐ much

10) Muddy area around well ☐ no ☐ small ☐ large

11) Drainage clean ☐ no ☐ medium ☐ yes

12) Soaking pit ☐ not present ☐ present

III

13) Communal material used ☐ never ☐ mostly ☐ always

14) (if also private Are they cleaned before use ☐ never ☐ mostly ☐ always

IV

15) Watercontainers filled on the slab: ☐ none ☐ most ☐ all

TYPE OF DEVICE AND CONDITION CONDITION WELL:

CONDITION SLAB:

Appendix 7 Programme, persons met

UNICEF
Dr. Kopano Mulelabai, Country Representative
Dr. Isiye Ndombi, Programme Planning Officer
Mr. Turhan Saleh, Planning and Evaluation officer
Mr. Berhane Berhe, WES Project Officer
Mr. Momtazul Karim, Project Officer, Logistics, UNICEF

WATER RESOURCES DEPARTMENT
Mr. G. Micael Temnewo, Acting Director General, WRD
Mr. Tesfom Haile, Project Coordinator, WRD

ERIWESP
Dr. Yemane Zecharias, naitonal Project Director, ERIWESP
Dr. T. Georgis Goitom, Chief Technical Adivser, ERIWESP
Ms. Ayesha Dias, Environment lgal Adviser, natural Resoueces andEnvironment Managemetn Branch, Department for Development Support and Management Services, United nations

Field visits were made to:
Anseba: Keren
Central: Zaghir
Debub Region: Adi-Gefah, Takita, Dekemhare
Gash-Barka Region: Engerner, Adi-Berhan
Hibo
Northern Red Sea Region: Demas, Afta

Appendix 8 Terms of Reference

Title:	Health and Hygiene Expert
Duty Station:	Asmara, Eritrea
Duration:	Two person months in 1996
Qualifications:	Master of Sciences (M.S.) or above in Public Health or related fields.
Experience:	At least 10 years of professional and practical field level experience in the design, execution, monitoring and evaluation of hygiene education and environmental sanitation interventions in developing countries, of which 5 years or more in arid or semi-arid regions, preferably in Africa. Awareness of and involvement in the design and management of service delivery institutions as well as investigation and/or formulation of pricing and financing strategies would be particularly useful.
Language:	English, with strong writing skills.

I. Background

The Government of the State of Eritrea (GSE), in cooperation with the United Nations and other external support agencies (ESAs), is establishing a programme to substantially increase the provision of safe water supply and adequate environmental sanitation to the rural population. Since 85% of the population resides in rural areas, this programme is expected to contribute greatly to improved health status as well as generate other social and economic benefits including higher labour productivity and expanded agricultural production.

The proposed Eritrean Rural Water Supply and Environmental Sanitation Programme (ERIWESP) will address key issues related to sector policies, regulatory frameworks, institutional arrangements and the design, implementation and monitoring of interventions. It will contain, among other things, a review of Government policies and strategies, an evaluation of the performance of current water supply and environmental sanitation projects and an assessment of the water resources potential in the country for long-term sustainability in service coverage. Particular attention will be paid to two major issues: groundwater which will be the principal source of safe water supplies; and, in the area of programme design, active community participation at all important stages of planning, implementation and monitoring.

II. Objectives

Under the supervision of the Chief Technical Advisor (CTA), the National Project Director and UNICEF staff as well as in cooperation with other national and international staff of the Project, the consultant will be expected to carry out the tasks outlined below.

1. Analyse conditions relating to hygiene and environmental sanitation in the rural areas of the country; the design, funding, implementation and effectiveness of interventions currently being executed to address identified problems; and the capacity of institutions entrusted with responsibility for service delivery in this area (including information, education and communication/IE&C).

2. Identify the most effective and feasible strategies for increasing coverage of sanitation facilities, improving hygiene practices and, as a consequence, generating potential health and socio-economic benefits. They should address the following issues:

   - the design of a feasible service delivery structure at national and sub-national levels;
   - requirements for investments in capacity-building, paying due attention to the necessity for "lean" institutions, given serious resource constraints (especially with regard to financing of recurrent costs);
   - approaches to community level mobilisation and participation;
   - methods, modes and orientation of IE&C;
   - identification and testing of applicable sanitary technologies and related support infrastructure (for example, development of local artisanal capacity for slab manufacture) taking into consideration the varying cultural and socio-economic characteristics of Eritrean society;
   - estimated costs of a national programme on hygiene education and provision of environmental sanitation (building on the elements noted above); and
   - pricing policies (including issues of subsidies and credit) as well as financing options (embracing support through public expenditure, cost recovery and cost sharing, resources from ESAs and other possibilities).

III. Methodology

The consultancy assignment will be carried out through:

1. Interviews with Government officials (policy-makers, senior planners, technical staff and field personnel), representatives from donor and non-governmental organisations (NGOs), and the staff of private consulting firms engaged in the sector;

2. Review of the literature (policy papers, reports, studies, programme/project documents) on hygiene and environmental sanitation in rural Eritrea;