NETWAS

Network for Water and Sanitation

7th Annual Regional Seminar

19—24 September 1993, Nazareth, Ethiopia

Theme: Management for Sustainability Water Supply and Sanitation Projects

Seminar Proceedings

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AMREF

AFRICAN MEDICAL AND RESEARCH FOUNDATION

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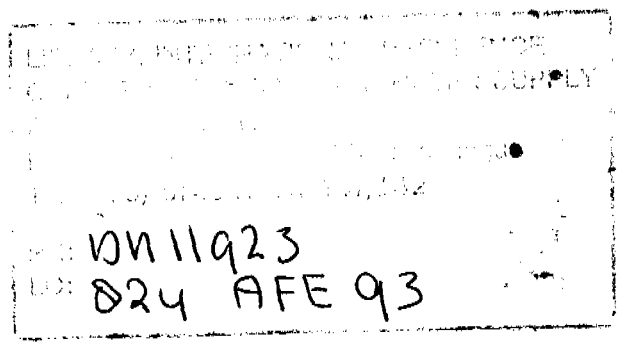

The Seventh Annual Regional Seminar

1 Introduction

The 7th Annual seminar was held in Nazareth, Ethiopia from the 19—24 September 1993. Participants came from 6 countries namely Kenya, Uganda, Tanzania, Ethiopia, Eritrea, Sudan from Ministries Health, Water, training institutions and NGOs'.

The seminar will be organized in a workshop format. Traditionally a theme is pre-selected and some participants are asked to present case studies to help the seminar focus on the theme. This year's theme was " Management for sustainability of water supply and sanitation programme". The participants expressed their expectations on the seminar as synthesis of factor contributing to sustanability, sharing of experiences, identify roles of actors at different levels, focus O&M in respect to sustanability and drawing up of workable recommendations.

Case studies from various field in different countries were presented. Participants from each country prepared country presentations in "country groups" to highlights issues/factors that contribute to the theme. Two areas were focused "Management" and "Sustainability". A field visit was to Dodota water project was organised. Issues emerging from the case studies and the country presentations were synthesized, discussed in groups and presented in plenaries.

Recommendation were drawn up for the regional level in groups and presented in plenary for adoption. Country representatives scanned the regional recommendations to formulate country specific recommendations.

Secretariat: Consisted NETWAS staff, chaired by I.O. Oenga, Members are Theresa Riunge and Zachary Bigirimana. Secretarial services were coordinated by Mrs. Agnes Masila.

1.1 Recommendations

The seminar participants made the following recommendations in the areas of management and sustainability.

1.1.1 Management

- The community and particularly women, be involved at all stages of the projects, especially in areas of decision making. To this end the community should be sensitized and trained.

- Communities should be encouraged to make by laws and regulations dealing with land easement, water utilization, facilities protection and socio-economic factors that affect the project.

- It is recommended that planners and implements encourage the cultivation of a sense of ownership by the beneficiaries of the project.

- Trained, qualified and motivated local staff should be encouraged to be employed in the project. Ensure qualified and competent external personnel transfer the skills and knowledge to the local counter parts.

- Quality control, for instance water quality, pollution, civil construction, hygiene, should be enhanced using effective monitoring systems.

- The responsible body should ensure adequate stocking, distribution of spare parts and accessories at the project level and encourage privatization.

- Monitoring & Evaluation participatory tools and follow-up should be carried out by both project personnel and beneficiaries at all stages of project cycle on regular basis.

1.1.2 Sustainability

- Water and sanitation committees should be composed of both genders, registered and recognised as legal entities, to act as a link between the beneficiaries and outside agencies, on project management issues.

- It is recommended that the initial funding is sufficient, to meet the required needs for sustainability. This should be governed by continues funding through fun & raising, water revenue collection and income generating activities which should be encouraged at the project level of cost recovery.

- Project planning should be based on community needs assessment in terms of materials, finances and human resources. The roles & responsibilities of all involved spelt out clearly.

- Promotion of health education to effect behaviourial change among community members should be inco-operated in all projects.

- To ensure smooth functioning O&M of projects, there is need to establish capacity building at community level, training, stocking of supplies, with great emphasis on preventive maintenance.

- Use appropriate technology need be encouraged.

- To ensure sustainablity, the community should be involved in decision making management, operation & maintenance of the project.

1.1.3 Other recommendations

- A technical committee composed of the six member countries, be set up, to assess and evaluate, the extent to which the recommendations from the work shop have been adopted & implemented.
- Men should be sensitized to take over, some of the responsibilities from the already over burdened women.
- The regional Seminal should in future invite some experts, from other parts of the world particularly Africa to participate.
- NETWAS should facilitate effective information gathering & dissemination in the region.

1.2 Workshop evaluation and suggested themes for 1994 annual seminar

Sharing of experiences and good response to participants expectations ranked highest in the evaluation by the participants. The seminar theme and methodology used in the deliberations were applauded by the seminar participants. Time and out of pocket allowances were considered by most participants as insufficient.

The 1994 Seminar themes were suggested as follows:-

- Grassroot community communication and information exchange.
- Improved databank for effective planning and management of WSS
- Towards community management and O&M of rural WSS
- Defining roles and responsibilities of the government, the donor and the beneficiary

The suggested venue by the seminar participants was as herebelow:-

1st Choice (3 points)	2nd Choice (2 points)	3rd Choice (1 point)	Total points
Eritrea (4)	Eritrea (7)	Eritrea (7)	Eritrea 33
Uganda (4)	Uganda (3)	Uganda (4)	Uganda 22
Kenya (3)	Kenya (4)	Kenya (6)	Kenya 23
Sudan (3)	Sudan (5)	Sudan (4)	Sudan 23
Tanzania (2)	Tanzania (4)	Tanzania (2)	Tanzania 16
Ethiopia (0)	Ethiopia (0)	Ethiopia (0)	Ethiopia 0

Ethiopia hosted the 1993 Annual Seminar.

2 Presentation of selected cases

2.1 Kenya Finland Western Water Supply Programme by Mr. Kaniaru

The programme is located in the Western Kenya. It is funded by Finnish Government, started in 1981. Initially it was covering an area of 5000 km^2 and population of 2.2 million people and later expended to an area of 8000 km^2 with a population of 3.1 million. The population density varies from 365 to 1000 people per km^2. Over 92% of the population live in the rural area, with approximately 2 hectares of land used for subsistence agriculture. The per capita income is quite low. The area has enough water both surface and subsurface sources. Rainfall ranges between 1000 - 2000 mm a year.

The programme objective were to improve water & sanitation and contribute to the improvement of health and economic development of the area.

The programme is to be implemented in four (4) phases in the period 1981 - 95. The project started with a supply driven approach with limited community participation and low involvement of local experts. The beneficiaries i.e. the communities were assigned the responsibility of operating and maintaining the water facilities and the out come was a break down of most of the facilities. In 1984 the community department was formed and involved in all phases of implementation in order to alleviate this situation. The role of the project was redefined. The district development committee monitors the distribution of the water points. Recently a demand driven approach was adopted.

Factors that have contributed to the success of the programme include sense of ownership by the beneficiaries, training of local artisans, information exchange and management by the communities. Community education through meetings has played a significant role. Involving communities in identifying, planning design implementation and monitoring of the projects and adopting the approach of partnership in discussions, sharing ideas have greatly contributed to the sustainability of the programme.

Communities manage, operate and maintain the systems. Training of local repairers, artisans, pump attendants (10% are women) has enhanced local capacity buildings. A mobile team from the programme provides supportive capacity to pump attendants. A total of 5 hardware and 3 women groups supply spare parts in the region. Presently the project is supplying the spares to the local shops but in the near future spares will be available from local manufactures. Over 3000 water points have been handed over to water communities. Communities can upgrade water points to piped water schemes. The communities manage their own funds.

A discussion followed at the end of the presentation. Some of the questions were:
1. To what extend are women involved?
2. What is the per capita cost of the options offered ?
3. Is Hygiene education carried out?
4. Which criteria or standards are used ?

The responses were:
1. Women were involved, nearly 90% of committee members are women.
2. The per capita costs are not ascertained yet.
3. Appropriate technologies are used ie. springs, shallow-wells, boreholes, piped water schemes pumped and gravity. Solar pumps are installed in some boreholes.
4. The standards are adopted from Ministry of Water. For water quality WHO guidelines were adopted.

2.2 HESAWA - Tanzania - by Mr. Mugenyi.

HESAWA project, started in 1984, covering three regions, Mara, Mwanza and Kagera. The case study presented cover Kagera Region, with an area of 28,000 km^2 with 3 districts, There is a population of 1.3 million with a growth rate of 2.3% . It has a rainfall of 300 - 2000 mm per annum. Temperature range between 16 - 20° c. The occupation is mainly subsistence farming.

There are abundant water sources. Most communities live within one 1 km. proximity of a spring. Rain water harvesting is employed in Karagwe district. There are a total of 68 borehole in Kagera 30 of which are privately owned, 38 are community/government owned. 60% of the pumps are partly operational due to poor maintenance, only 30% are well-operated. The local population has resorted to natural source such rivers and stream with all the sanitary risks, since the catchment areas of these source are grazing land and also areas of human abuse. Discontented communities vandalised water schemes.

In 1982 an agreement was signed between Sweden and Tanzania to supply water to three (3) regions with objectives of improving the health of the people through sanitation and water. This will enhance economic development. The programme utilises shallow wells, gravity schemes, rainwater harvesting and spring protection (improvement of traditional water sources). Hydraulic hydrams and solar pumps are sometimes used.

The government policy is that communities should participate in all stages of the project ie. Planning, implementation, monitoring, evaluation and maintenance of the water sources. The government will play a supportive role and motivate the technical staff. Decentralization of planning, implementation operation & maintenance, involvement of the community and improve the status of women enhance sustainability.

The presenter showed slides covering protection of a gravity flow source and construction of gravity main, VIP latrines, production of water jars and rain water collection and storage facilities.

2.3 DODOTA - Ethiopia - by Mr. Amsalu Negussie

DODOTA project is a water supply system operated by women. The project is located in Awarada district, in the plains with no underground water potential. After discussions the women in Dodota agreed that water was their priority.

Surveys were carried out to Identify water sources. Two springs were identified in the highlands bordering Dodota. With the assistance from CIDA, these sources were developed into a gravity scheme to serve 56,000 people. The project cost was US$ 1.0 million 14% was community contribution while 86% was from CIDA. Project duration was three years 1982-85. It was implemented in three phases 131 women were selected and trained 51 of whom became permanent workers on the scheme.

The community established an autonomous body which manages the scheme. Each water point has an attendant and is a metered. All water users pay for water drawn. The funds are used to pay the workers. The scheme has been in operation for the last 9 years. Evaluation was carried out recently and it established that the project is reliable, people have more water, women use less time fetching water. The training within the project enabled the beneficiaries O&M, offered job opportunities and enhanced the sense of

responsibility. The consumers pay for services rendered. Since the start of Dodota, four other projects have been established on the Dodota model.

Questions/ Answers

1. Was hygiene Education carried out? - Project planning, Hygiene education was opted for but due to no clear roles of the participating ministries, not much information was available.

2. What was the men's influence in the project? - both peasant and women association worked together for prosperity.

3. Were all the people who participated in the project paid fully or partially? Full time workers are fully paid for the services rendered, communities provide free labour on short term as a contribution.

4. Are new settlers catered for ?- Is there a system for cost recovery ? Who pays for water consumed by institutions ? Does the supply meet the current demand ? How are private connections treated ?

The project is not able to assess the issue of cost recovery but it cannot be abandoned. The supply meets the current demand. Various institutions pay for public sector. Private connections were highly charged in order to discourage it. The project was designed with 4% rate of population growth over 15 yrs. Water use is not limited to human consumption, the committee has to decide.

2.4 RUWASA - Uganda by Mr. Samuel Mutono

RUWASA is rural water and sanitation in Eastern Uganda funded by DANIDA since 1991 and designed to last ten years. There was a prior planning for 1 ½ year before embanking on the project. It covers 8 districts with 4 million people. The target out put is 1200 points each year.

Implementing ministries are Natural Resources, Health, Local Government, Women in Development and Finance, Planning & Economic Development.

The objectives of the project include:-
- To improve the quality of life by sustainable reduction in water borne disease.
- To improve Health
- To reduce the burden of collecting water.
- Ruwasa definition of sustainability as "the water points should be maintained even after completion.

Strategies :

- Giving O & M higher priorities from the start.
- Using and developing existing institutions.
- Promoting community involvement.
- Promoting the role of women.
- Using affordable and maintainable technology.
- Using objective oriented approach.

Question :

1) What's the donor - project relationship?
2) How is the people's attitude ?
3) Are there any efforts by the private sectors to support the water project ?
4) Are there any institutionalized process for spare parts ?

Response :

For the spare parts, the District Committee has revolving fund and lower levels shopkeepers on the technical advise of RUWASA. A local manufacture (Fabricator) has been identified. Quality control is by government policy to adhere to the Uganda national bureau of standards.

Behavioral change :

There is improved hygiene component by having community health workers mass-media has helped a lot.

3 Management and Sustainability

Each participant was given a set of cards coloured pink, green & yellow: Pink to denote national level; green to denote middle level and yellow- project level. Each participant was to write issues on each card relevant to management or sustainability activities on a corresponding level. The cards were posted to a wall under the heading national, middle & project levels. The issues were to reflect on the presented cases and participants own experience. The issues so raised were discussed in groups and presented in plenary. The groups to discuss issues relating to management and sustainability was done in a participatory manner. Each participating country was allocated a colour code as follows:-

Pink - Kenya
Green - Uganda
White + Green Star - Tanzania
White + Blue dot in a blue square - Eritrea
Plane White - Ethiopia
White + Black dote - Netwas
White + ? - Sudan

Names of participants from participating countries were written on corresponding cards. Cards written A, B, C, on one side and groups 1, 2, 3, & 4 on the other side were placed in a horizontal row against a wall. Each participant was required to paste his/her card on either of the four cards in such a way that the number of participants in each group from one country was balanced. To start with the group letter coding was discussed, then the group members were the same at the end of the exercise.

3.1 Issues at national and middle level: Group I

Summary Table

Management	Sustainability
• Planning at the national level • Monitoring - Evaluation & modification • Capacity building - Institutional - Human resources • Enabling Environment (policy formation) - Legal issues - Cost recovery - Standardization & guidelines - Community involvement - Operation & maintenance/spare parts - Resource allocation (local & external) - Political will • Information systems (WASAMS)	• Appropriate technology • Community and local expert involvement • Funding

3.1.1 Management at national level

Planning: Identify and prioritise the needs, set targets, assess the required vis-a-vis the avai resources, identify possible sources of funds and resources - internal/external and set strategie for planning and implementation. Monitoring, evaluation & modification: There is need to establi a monitoring system at the national level going down to the community level to maintain continu information flow

Capacity building: At national level we need infrastructure and a policy on the human reso requirements. Enabling environment (Policy formulation): Each government should endeavour to have a clear policy regarding the items listed under enabling environment (above).

Information systems: The usefulness of WASAMS (Water Supply and Sanitation Monitoring Syst is recognised as a useful tool in planning & management.

3.1.2 Sustainability at the national level

Definition: This implies the continuous delivery of services and/or goods to an acceptable level over the design period supported by effective management.

Appropriate technology: Importance of having some guideline regarding the use of approp technology and standardised equipment.

Community and local expert involvement: Need to indicate the importance of involving the commu and local experts at all stages of the project

Funding: Need for governments to allocate sufficient funds to enable project sustenance an to encourage donors to allocate funds at appropriate levels of the sector.

3.1.3 Management middle level

Summary Table

Management	Sustainability
• Personnel • Other Resources • Monitoring & Evaluation • Decision making	• Technical Support

Definition: Middle level understood to mean regional and/or district level

Personnel: Identify, quantify, assign and develop personnel as required by project.

Other resources: Ensure equitable allocation of funds and other resources and implementing a system of collecting payments from community

Monitoring & evaluation: Middle level is the focal point for monitoring and evaluation of projects, collection of information for report compilation in order to satisfy government and/or donor requirements.

Decision making: The middle level should be empowered to make decisions concerning the project eg. management, technology, evaluation etc.

3.1.4 Sustainability in the middle level

Technical support: Support to be provided at middle level to include planning, implementation, O&M, monitoring and evaluation of projects. This is to be in the form of training, technical know-how, community mobilization and monitoring and evaluation skills.

3.2 Issues related to management & sustainability at project level: Group 3

3.2.1 Management issues

Women involvement: Traditionally women were marginalized and even ignored in decision making process though they are the most affected in WSS. Women need to be sensitized on leadership, decision making and management. Training is necessary.

Legal issues: Several legal issues present themselves. These include land easement for the project, water & sanitary by-laws, legal status for water committee and Socio-economic factors should be taken in to considerations

Ownership: Ownership maybe enhanced by allowing direct beneficiaries get involved in all stages on the project Contributing in cash, kings, labour is a key factor.

Staffing: Identify project needs and maximum involvement of the water users (unskilled and semi-skilled).

Training: Train the local community in both technical and non-technical skills eg. (management and communication).

Remuneration of attendants: Payment in cash or kind is necessary. Funds need to be praised by selling the services rendered by the project.

Standardization: Design, pumps, generators, tools, to minimize types is necessary for sustainability.

Quality control: Includes construction or workmanship, equipment and materials, water quality (software activities), services offered and software activities (eg. training, hygiene education.

Spareparts: The production or acquisition, stocking and distribution is to be taken at the national and middle levels. The project level could develop/use local skills for production of certain spareparts, encourage private shop keepers or other institutions to stock spare parts and discourage government/project free/subsidized supply of spares.

Monitoring & evaluation: Should be done at all stages ensuring the involvement of users. It should be used as a management tool. Indicators such as record keeping, stock taking, staff performance, should be established. Reporting and feedback (information flow) could assist in data gathering.

3.2.2 Sustainability issues

Women involvement: Should be given management skills, O&M, revenue collection, book-keeping, income generating, members of WSS committees

Water & sanitation committees: Composition both genders from the beneficiaries. They link or liaison between the concerned outside agencies and the communities and General supervision and management of the system.

Training: Technical & non-technical training is necessary especially software aspects.

Spare parts: Ensure continuous availability and supply - affordability and accessability. Privatization is a desired step.

Funding: Project appraisal to be done with the community to encourage community to contribute in funds.

Project planning: Who does what ? when? where? role definition and responsibility. Ensure beneficiaries involvement.

Hygiene sanitation practices: To derive full benefits from the project there must be hygiene & sanitary education to effect behavioral changes among users. Healthy users is the pre-requisite for sustainability

O&M: Develop skills, supply of materials, promote on-the job training, ensure institutionalized capacity at community level. Full responsibility for O&M must be given to users.

Technology: Appropriate, affordable and accessible is the desirable technology.

Revenue/cost recovery: Encourage communities to start income generating activities, charge for water used and sell water (vending)

Community involvement: At all stage of the project is crucial sustainability and proper management thereof.

3.3 Management and Sustainability issues at national and middle level: Group 2

3.3.1 National level

Management

Inter-Agency Coordination: The group observed that in many countries there are steering committees responsible for discussing issues related to water and sanitation projects; but still inter-agency coordination is needed in order to ensure even distribution of services. (eg. donors tend to concentrate their support in certain area of the country). Which Ministry/Agency to coordinate will depend on the country in question.

Monitoring & Evaluation: Monitoring should be a continuous process, throughout the project phases at all levels, but the level of Evaluation will depend on the size of the project and could be done periodically.

Budget Allocation: Most of the overall budgets for water and sanitation projects are heavily subsidised by donors in all countries; in order to sustain the projects an increase in the local budget allocation and the governments to fulfil their commitments is necessary.

Institutional capacity building (Training): Training should involve various actors from different levels. eg. engineers, politicians, government leaders, and planners in order to enhance the sustainability. This could be achieved through seminars, workshops and improvement on the curriculum for implementors at various levels of training. Where there

is shortage of professional staff formal training should be arranged. This includes; training of engineers and sanitarians etc.

Legal issues: In some countries they are existing but not up dated also the issue of water right is not considered in other areas. Thus the group proposed the legislation at national level to regulate pollution control, water use and sanitation.

Information flow/exchange: They are existing but not properly documented. The horizontal and vertical information exchange is necessary. Also, Regional information flow is important. NETWAS is in this case is recommended to shoulder the task. Strengthening documentation centres in different countries is important. Data collection, storage and dissemination is the responsibility of the Ministries concerned.

Enabling environment (Policy): In order to have sustainable O&M set up; a water & sanitation policy emphasising on:

Standardisation of pumps and spares, privatisation in water and sanitation, design standards, cost recovery, community involvement women and water use is recommended.

Sustainability

External Funding Support: Agreed plans for the deadline and gradual phasing out of the external funding support is necessary for sustainability. This will give more time for recipient countries to organise themselves to take over the responsibilities.

Funding Levels: For sustainability of water and sanitation projects funding levels should be adequate. Subsidy from the government becomes necessary when cost recovery does not meet the running cost of the project (in rural areas).

Manufacturing spare parts: The manufacturing of pumps, spares and other accessories should go together with distribution of the same to the consumers.

3.3.2 Middle level

Management

Capacity building: Organise short term training courses for local attendants and co-ordinate training at project level. Staffing of personnel to projects to be handled by middle level in collaboration with national level.

Information flow/reporting: There should be a district data base centre created at middle level and information flow should be up, down and horizontal.

Decision making: Decision making has to be carried out at middle level and proposals submitted from project level to national level for approval.

Coordination of resources: Coordination of resources, equipment manpower and financing activities be carried out at middle level to facilitate implementation of projects,

Evaluation & Monitoring: Evaluation and monitoring should be done regularly to assist management of the projects.

Project Planning: It should follow appropriate technology to ensure good management.

Sustainability

Technical support: Projects will be given technical support with subsidy from middle level for operation and maintenance periods.

Project planning for O & M: For sustainability of projects it is essential and need be done by the beneficiaries directly or paying for the water charges.

Community participation: Formulation of strategies and mobilizing resources is important in order to facilitate community participation.

Training: It is important at the middle level to train extension field staffs and communities to participate in O & M activities.

Water Tariffs: It should be cost recovery for both urban and rural areas with rural areas initially given subsidy for a certain period of time.

3.4 Management and sustainability issues at project level: Group 4

3.4.1 Management issues

Women Involvement need cover decision making, problem identification, priorities siting, choice of technology tariffs. The project identification, planning, implementation, monitoring and evaluation, management of resources need involve women. Initiating, managing income generating activities, training and environment sanitation hygiene need target women.

Monitoring and evaluation: Training of project personnel and beneficiaries to monitor and evaluate their own projects. Beneficiaries need to operate & maintain accurate data and reports pertaining to their projects. Systematic information flow and sharing is necessary for proper management.

Spare parts: Produce/manufacture spare parts locally, make them available, accessible and affordable. (Efficient and fair distribution of spare parts). Train and encourage local artisans to produce spare parts. Ensure that a system for spare parts distribution is established.

Remuneration of attendants: The beneficiaries are to decide on the suitable/acceptable remuneration package. Project should provide guidelines where necessary.

Ownership: If the beneficiaries have to own the (system) project, they should be involved at all stages of the project cycle. Sensitization of beneficiaries about their responsibilities is necessary. Define ownership and role.

Staffing: Adequate, well trained and motivated staff are crucial for management. On job training & refresher courses, pre-service training, use of local expertise and remuneration of local counter parts are necessary prerequisites, define TOR's for external experts, design proper job descriptions for all staff, develop a guide to career path and career development.

Quality control: Quality of material supplies and equipment, water, construction work, personnel. Liaise with quality control bodies like the national bureau of standards,

government chemists, bacteriologists and health Inspectorate. Establish laboratories to monitor quality.

Standardization: Establish and adopt standards for materials & equipment. Policies to address standardisation at national level with recommendations from project level. Establish and seek approval of specifications of manufactured goods. Establish design guidelines.

Legal issues: Project ownership should be legalized. Project sites should delineated and legally recognised. Water rights should be obtained at the beginning of the project and be explained to the beneficiaries. Project to adhere to the prevailing water and sanitation regulations and increase awareness beneficiaries on existing regulations

3.4.2 Sustainability

Women Involvement: The safely, preventive maintenance, repair, sanitary conditions, upgrading of schemes need be vested in the women. Providing skills to women to do this is necessary.

Water users and committees need be created. The committees need be active with well defined roles and responsibilities. The need be re-elected periodically. The O&M, repair, seeking support and keeping the systems from damage need be vested in the committees.

Training: Emphasise participatory training for sustainability, assess the impact of training, determine training need, formulate a training programme and conduct structured seminars for water users and committees.

Spare parts: Train and encourage local artisans to produce spareparts. Encourage private distribution of spares.

Funding: Beneficiaries contribution (kind/cash). Adequate level funding. Solicit support from external sources to supplement the local efforts. Create revolving fund.

Project planning: Involvement of beneficiaries in all stages of project cycle. Project plan should fit in the overall national plan. Plan should focus on appropriate technology and use of locally available materials, to ensure sustainability.

Ownership: For sustainability, ownership of projects should be entrusted to beneficiaries where feasible and appropriate. Ownership should be legalised. Government should oversee smooth running of the project

Hygiene Practices: Health education should be intensified. Emphasis on behaviour change is crucial. Involve extension workers on supportive role. Protection of water sources and safe water use is necessary. Encourage communities to improve and maintain their environmental health, organising health committees at community level maybe useful.

Operation and maintenance: Community based O&M (village level operation and maintenance) enhances sustainability. Regular preventive maintenance, record keeping, adequate trained technicians, and spareparts are all necessary for proper O&M.

Technology: Use technology appropriate and affordable to user community enhances sustainability.

Revenue: Tariffs should be adequate to cover cost O&M and depreciation. Establish a water fund at community level.

Community involvement/participation at all stages including decision making helps increase sense of ownership.

4 Country Presentations

4.1 Discussion in Country groups

The participants formed one group per country. The following terms of reference were given to help guide the discussions.

(i) Display organisation of the sector
(ii) List types and levels of sector training institutions. Are there any felt gaps in training? Consider what graduates/trainees are called upon to do.
(iii) Outline the main aspects of sector policy and how it is operated. Are there relevant sector guidelines? e.g. sanitation guidelines.
(iv) At national level what are the policies related to women, training and development.
(v) Highlight any other special issues not covered above which you consider important.

The six groups conducted discussions based on the above TOR. Each group presented in plenary. During presentation Eritrea group expressed the fact that their country is new and at early stage of formulating national policies and strategies.

4.2 Ethiopia

Sector organisation

Water Resources Development is under the Ministry of Natural Resources Development & Environmental Protection. It comprises the following authorities Water Supply & Sewerage Authority (WSSA), National Meteorological Services Agency (NMSA) and Water Resources Development Authority (WRDA). The Addis Ababa Water Supply & Sewerage Authority is under the Municipality of Addis Ababa. At regional level Natural Resources Development & Environmental Protection Bureaus are responsible for design, planning, construction, budget & management. The central ministry offers technical support

Sanitation (Health)

Is under the Ministry of Health, Environmental Health Department. It has the water & waste water quality control and sanitary technology research division. At regional level the regional health bureau coordinate sanitation activities.

Training institutions

Training institutions which offers courses in water include Faculty of Technology (B.Sc. in Civil Engineering) (under the Higher Education Main Dept. of Min. of Educ.) - M.Sc. in Hydraulic engineering), the Arbaminch Water Technology Institute, (B.Sc. and Advanced Diploma in water Resources Eng).

Certificate level training in community water supply & sanitation (1 yr), practical water supply & sanitation (3Ms), community management (6Ms.), and small scale irrigation (6 Ms.) are also offered.

In addition a number of short courses, seminars, skills upgrading and on the job training are offered at sector level.

In the sanitation (health) training is done at Gondar college of Medical Sciences :- Dept. of Environmental Health, Diploma in Sanitary Science) 2 years, Jimma Institute of Medical Sciences: Dep.of Environmental Health. (Diploma in sanitary science) 2 1/2 years.

Main aspects of sector policy

The sector policy is under formulation for both water and sanitation. It is expected to include tariff, service level, standardisation, waste disposal, housing and institutional sanitation and water quality control.

Policies related to women training and development

Women Affairs office is under the Prime Minister's Office headed by woman minister. In the near future in all relevant line ministries will have women's affairs department. At the regional levels there will be women's affairs bureau. The proposal already drafted & to be presented to council of Ministers. Women in education generally 31% enroled are women, despite that a large number drop out.

Other Issues

Decentralisation and privatisation contributes significantly to the proper O & M of the many water schemes that are constructed. Coordination between the various ministries responsible for water and sanitation will enhance the status of sanitation as more emphasis is given to water at the present time. Donors need harmonise their requirements.

4.3 Uganda

Sector organisation

There are 3 major projects dealing in water and sanitation. RUWASA - supported by DANIDA - 8 districts, SWIP supported by UNICEF - 10 districts and WATSAN supported by UNICEF - 16 districts. Four districts not yet supported. There are NGOs in all parts of the country. All these projects are government approved and supported.

Ministry of Finance and Economic Planning (MOFEP) scrutinizes all projects to ensure they are in line with government priority areas and ensure that the project are financially viable and sustainable. Implementation is at district level. At national at level policies are developed. The water and sanitation monitoring systems (WASAMS) is being adopted.

Training Institutions

Makerere University offers degree courses in engineering including civil engineering, sociology, geology, chemistry, biochemistry and medicine among others. At post graduate level a master of arts in women studies in noteworthy.

The Uganda Polytechnic, Kyambogo, offers both higher, ordinary diploma and certificate level courses in civil/water engineering. Other colleges offering diploma and certificate courses include Elgon, Lira and Bushenyi. Mbale school of hygiene offers diploma in environmental health studies while Nsamizi training institute offers a diploma in social work. A number of technical institutions offer certificate courses in craftsmen and artisans.

Felt gaps in training include hydrogeologists, drillers, management and a degree in environmental health studies. Field practical training need to be enhanced.

Main sector policy

The main aspects of the central government policy include move from implementor to promoter, cost recovery especially in O & M, standardisation especially handpump, community involvement especially women, use of low cost technology, priority in preventive and promotive services and empowerment of community.

The national guidelines include national sanitation guidelines, decentralisation, privatisation and cost sharing with reduced subsidy.

Training & Development of women

Review of government policies to make them gender responsive eg. Ministries of education commerce and industry, natural resources and health.

Other efforts are M.A in women development studies (new course at University), seminars organised by women in development, extra weight marks given to female university applicants (1.5) representation at all resistance council levels (secretary for women) and national parliament representative from each district. Also there is in place a Ministry of Women in Development.

Other Important Issues

National village Infrastructure inventory and cost effectiveness study done. Water development guidelines, water action plan, to be prepared. Women involvement guidelines to be prepared. The Uganda national programme of action for children has been launched, while standardisation, school health project and WASAMS are being established.

4.4 Eritrea

Training

Asmara technical school offers diploma course for surveyors, auto machiners, general machiners and radio electricians. The Winna vocational school offers certificate courses in surveying, mechanical and electrical. Water resources department offers refresher courses for its staff especially maintenance crew (O&M), village pump attendants (on the job training), surveyors and social animators.

Water sector

The water sector is one of the top government national priorities. The sector currently engaged in reconstruction and rehabilitation of existing water supply schemes, strengthening its institutional planning and implementation capacity. In accordance government policy of decentralized management approach, WRD is strengthening itself at the regional levels and
at operational levels.

Women

Generally speaking government policy allows women to participate in the decision making processes, technical and non-technical training opportunities are equally given to both men and women. The water sector has women engineers, draughtswomen, social animators and pump attendants at village level.

4.5 Tanzania

Sector organisation

Three ministries that of water, energy minerals, ministry of health, ministry of community development women and children affairs are relevant to water and health sector.

Felt gaps in training

The establishment of water engineering department at the University of Dar es salaam and integration of software and managerial skills in the syllabi are needed. The establishment of degree course for public health officers, and enhanced practical training is necessary.

Aspects of sector policy

A national water & sanitation sector policy is in existence. It emphasises the involvement of beneficiaries and the private sector for the sustenance of the projects. A strategy and action plan document has been formulated and approved by the government.

Women training and development policies

The policy emphasises the need to empower women in implementing and sustaining water & sanitation facilities through training. e.g. in formulating village water committee, 50% must be women.

Other specific issues

A target to implement the national water and sanitation policy has been set at the year 2002. For this an annual budget allocation of Tsh. 456/bill ($ 900m.) is required. The government is soliciting the funds. Chief actors are the beneficiaries, the government, private sector, ESAs & NGOs.

Efforts to organise and mobilise the private sector potential have started. A move to co-ordinate ESA & NGO effort has started by holding regular sector liaison meetings. PROWWESS/SARAR workshops have been conducted throughout the country at national, regional and district levels. The process has been institutionalised. A sector monitoring team has been established and establishment of data base has started.

4.6 Kenya

Organization of the sector

The water and sanitation lies in the ministries of Land Reclamation, Regional and Water Development, Health and Local government. Interlinkages are necessary in order to harmonise and enhance the impact.

Training

Training exists at post graduate, graduate, technician, artisan as well as community levels. The main areas are technical, managerial, financial and social. Technicians need to be trained in social as well as communication skills.

Sector policy

Has not come out clearly but there are guidelines. Approach is to enable every Kenyan have access to reasonable quality water and sanitation utilization of locally available resources together with foreign assistance has been encouraged.

Policy related to women training development

The approval is to treat women equally with men has been promoted over the years.

Other important issues

- Realisation of the importance to involve the beneficiaries (communities) in the sector activities. The understanding of cost sharing and cultivation of a sense of ownership of the sector activities is being pursued.

4.7 Sudan

Organization of sector

Ministry of Irrigation and Water Resources Responsible for assessment and development of water resources all over the country. The National Rural Water Corporation, Urban Water Corporation and State Ministries for Housing have roles to play in the sector. These include at national level assessment, planning & design, training, procurement and supervision & Management. At state level implementation of project, operation & maintenance and community involvement.

Policy of sector

Previously water provision was considered as a free service, now consumers have to pay for operation O & M. The government takes care of the major repairs and rehabilitation programmes. Other activities are the responsibility of the state government.

Training institutes

The University of Khartoum has the faculties of engineering, environment and public health as well as faculty of science. These often graduate & post graduate students in water

supply and sanitation. Other universities are Sudan University for science and technology, Geriza University and Upper Nile University. Several polytechnics exist, these include extra mural studies (U of K), polytechnic (S.U), and Wad Elmagboal Institute (S.U). Enough graduates in water resources, sanitary engineering and public health come from these institutions.

Shortage in technicians, public health officers, plumbers, laboratory technicians in water quality and computer technicians is common. Regional and international assistance is needed to promote the capabilities.

Main aspects of water sector

Ambitious strategic ten years plan in adopted to increase the coverage. This plan needs adoption of practical approaches capacity building, set up of design criteria & guide lines. The provision of proper water management aspects including legal organizational aspects. Encouraging community involvement and owner ship. This plan can not be achieved without the collaboration of both international & national agencies.

Other issues

Decentralization has benefits and draw backs. Political issues need be harmonised with technical, financial realities. Pressure in water supply systems (creation of water shortages) cause difficult for the proper management & sustainability. The adoption of low cost technology e.g. hand pumps, use of local materials and renewable energy. (solar,wind etc.) need be considered.

5 Detailed discussion on Recommendations

Three groups constituted to formulate seminar recommendations. The terms of reference included formulation of recommendations relevant to:-

- National level by group A3
- Middle level by group B2
- Project level by group C1

Each group was also requested to make recommendations relevant to the sector in the region and indicate those that can be implemented at country levels.

5.1 Group A3: Management at National level

Inter-Agency Coordination Unit: It should be established and fitted into the Government structure. This unit should be charged with the responsibility of providing guidelines.

Planning: The plan should be there and should include the following points:

- Realistic, time bound and flexible
- Focus on community involvement
- Promote future management and sustainability
- Emphasize on Bottom-Up planning approach

Monitoring, Evaluation and Follow-up:

- Should be done continuously and not just at the end
- Should be reporting and feed-back in all relevant directions
- It should be a component of the planning

Capacity Building: Institutional and Human Resource

- There should be a policy on capacity building
- The government should give proper support to the human resource development
- There should be optimum use of human and training resource to avoid duplicity, (utilise existing training institutions in country and in the region)
- A national survey should be done on the needs of human resource, equipment, fund, etc. to identified gaps.
- There's need to establish human resource development program and realistic implementation plan,
- Should be focused at lower levels.

Enabling Environment: Each country should endeavour to have clear policy on the following issues:

- Legal issues;
- Cost recovery;
- Standardisation and guidelines;
- Community involvement;
- Operation and maintenance;
- Resource allocation (local and external)
- Political will

Information Systems: There should be:

- Information flow;
- Information Bank
- Retrieval method;
- Exchange of information
- Strengthening documentation centres in different countries
- Information validation should be exercised at all levels
- Acquiring information should get government support
- *There should be sharing of relevant information in all relevant directions*

5.2 Group C1: Sustainability at Project level

The group members deliberated on issues pertaining to management and sustainability of water and sanitation projects at National and Regional levels and recommended that:

Appropriate Technology The group members observes that current practices tend to mix a variety of imported technologies which are often not easily adopted and therefore recommend that:

- Adopted technologies should be affordable, simple, replicable, self-reliant, sustainable
- Governments should develop guidelines leading to the applications of technologies that focus on the users,
- Technologies that focus on the users, which maximise the use of locally available resources

Community and Local Experts Involvement: The group observes that there has been minimum involvement of communities and local experts and recommends that:

- Communities and local experts be involved at all stages of the project cycle,
- Governments should encourage the employment of local experts at all level.

Funding: The group observed that the Water Supply and sanitation sector in most countries in the Region does not receive the national priority it deserves during fund allocation. The group therefore recommends that Governments should realise that provision of safe and adequate water and sanitation facilities to the communities means improve health and better survival and that the water and sanitation sector should be seen as a backbone of the national development and should therefore allocate funds commensurate with the priority accorded to the sector by the communities.

Revenue: The group observed that provision of water and sanitation has been seen before as a free service which has affected sustainability of projects. The group therefore recommends that Governments formulate policies which emphasise that provision of water and sanitation is not a free service and that communities should maintain their own systems, through cost recovery.

5.3 Group B2: Recommendations middle level

Recommendations at the country level
Motivation and training of middle level cadres emphasising

- Planning
- Management
- Training skills

Decentralization
- Planning/Decision making
- Budgeting

Standardization of data/information
- Collection
- Processing
- Storage
- Planning parameters and indicators

Standardization of
- Designs
- Equipment
- Spareparts

Recommendations at regional level
Identify suitable manufacturer of equipment and spare parts for the region in order to reap the benefits of economies of scale.
Identify training programs, *minimum* entry requirements, eligibility of candidates from the region
Exchange of technical staff.

Sharing
- Information
- Experiences
- Exchanges visits
- Mid-level managers should adequately explain the technology to the users.
- Monitoring, and evaluation should be require/continuous and effectively shared vertically and horizontally and by gender.
- Formulate and communicate strategies to improve community involvement in resource mobilization with emphasis on women empowerment.

Note: Sustainability is possible if management is effective at mid-level (focal point).

- Carry out persons management - identify quantify, assign and develop personal required by the sector or project implementation.
- Co-ordinate sector information and resources for equitable distribution of resources and strengthening decentralization process.
- On decentralization mid-/level managers should pase on some of the responsibilities to lower levels of the sector.

6 The Kenya Finland Western Water Supply Programme

By Eng. K. Kaniaru

6.1 Introduction

The overall objective of the Kenya-Finland Western Water Supply Programme is to improve the water situation in the area in order to achieve improvement in general health and economic development. The Programme aims at achieving its objective by developing ground water resources and providing point source supplies such as dug wells, boreholes and protected springs. In addition, the Programme also develops gravity schemes utilizing high yielding springs and small pumped piped schemes utilizing ground water.

Since its inception, the Programme has been implemented in three phases:

- Investigation and Planning phase from February 1981, to October 1983.
- First Implementation phase (Phase 1) from January, 1986 to December, 1988.
- Second Implementation phase (Phase II) from January, 1986 to December, 1988.
- Third Implementation phase (Phase III) from January, 1989 to December, 1992.

The Fourth Implementation phase (phase IV) started in May, 1993 with a Bridging Over phase between january and April, 1993.

In the earlier phases, the Programme extended partially over four districts, Kakamega, Bungoma and Busia in Western Province and Siaya District in Nyanza Province. The area covered by earlier phases was 5,230 km^2 with an estimated population of 2.1 million people in 1992.

6.2 Background information

The Programme area, in the fourth phase, in located in the western part of Kenya and shares a common boundary with Uganda. It is situated north of Lake Victoria and has a total land area of approximately 8,410km^2. The population within the area is estimated to be about 3.1 million people with a growth rate of 3.5%. The average density is about 365 people per km^2 with some areas having a density of over 1,000 people per km^2. It is divided into five districts namely Kakamega, Bungoma, Busia, Vihiga and Mount Elgon. In the area, almost all the people live in the rural areas and more than 92% of the population earn their living from agriculture and livestock. The plots of land are generally small, averaging about 2 hectares. The income level is fairly low with an annual per capita GDP between Ksh 1200 - Ksh 1400 compared to the national average of Ksh 3447 in 1988. The Programme area has relatively high rainfall with a mean annual rainfall varying from 1,000 mm/year to 2,000 mm/year. Because of this high precipitation, several rivers exist, most of them originating from the Cherangani Hills, Mt Elgon and the Nandi Escarpment. The major ones include rivers Nzoia, Malaba and Yala. The estimated surface runoff varies from between 5.3 1/s/km^2 and 21.5 1/s/km^2.

Surface water in the province has colour and high turbidity throughout the year and is polluted. The main contributors to this pollution are coffee, sugar and paper factories situated in this area and the main pollutants include nutrients (phosphates and nitrates) fungicides and herbicides.

Springs are an important source of water except in the south western part of Busia. Most of them flow throughout the year and they are of fair quality. Bacteriological contamination is common in unprotected springs which is caused by surface runoff entering the spring or by unhygienic modes of abstraction or conveyance to the households.

Shallow ground water is available in some parts of the province which generally occurs from 2.5 to 8 meters below ground level whereas deep groundwater potential is good except in the southern and northern parts of Busia and Bungoma Districts respectively. In most cases, boreholes drilled in this area are generally between 50 and 80 meters deep.

6.3 Approach / Strategy

In the beginning of the Programme, a supply driven approach was used with a high construction rate which left very little opportunity for community involvement. The Programme was more of a construction project with set targets of the number of schemes to be completed in a year. The involvement of the beneficiaries and other relevant agencies was not fully addressed. For example the project started with the consultant and locally employed staff with no personnel from the relevant Ministries.

The ultimate beneficiaries of water supplies are the communities where systems are constructed. For many years and until the second phase, the community was a passive beneficiary to which a new system was given and it was then up to the community to use, operate, and maintain it as best as it could. It was not at all surprising that this concept of the community role led to many abandoned systems and therefore wasted resources. It is important that the community and other relevant agencies such as Ministries etc be involved right from the beginning of a programme such as this one.

The Community Department was established in 1984 after realization of the importance of involving the beneficiaries. Involvement of beneficiaries in the management of the water supply projects is one of the surest ways to sustain the project in future. From then, onwards the involvement of the community has been an integral part of the Programme and there has been a gradual change to a demand driven approach.

The demand driven approach will be used in implementation of the fourth phase. With this approach, the Programme's role will change and become more of a promoter. In return, the beneficiaries will play the major role in identifying needs and setting up goals related to their development targets. For all community water supplies, the beneficiaries should be prepared to meet costs related to developing, operation, maintenance and management of the water supply.

Through the District Development Committees (DDC), and the District Water Boards (DWB), the relevant expertise will be available to the communities. The same boards will monitor the water supplies for water quality, management, operation, maintenance, and sustainability. As such, when the major donor withdraws, it is expected that these supplies will continue functioning as intended.

6.4 Awareness creation

For a community managed water supply to be successful, the way the project was introduced is important. If the installation was as a result of felt need of the community then a sense of ownership will be there. On the other hand if it was not as a result of felt

need, then the need should be created. The community needs to know the advantage and both economic and social benefits which are related to the new development. In the Programme, this awareness is created by holding meetings and also through training at different levels. Also due to the long duration the Programme has been in the area, it's activities and results from the neighbouring communities are well known. Although the awareness is there, some of it is misdirected and there are still areas which require to be addressed. It would seem as if awareness on the demand driven approach is already there judging from the number of requests and the content of the applications. To sensitize the community and other relevant agencies on the new approach, the Programme has prepared ' 'information packages' which will be distributed to people requesting improved water supplies.

6.5 Community participation

6.5.1 Community involvement

In order to ensure that the water supplies are sustainable, the Programme, together with the Ministry of Land Reclamation, Regional and Water Development, Ministry of Culture and Social Services and other relevant agencies ensure that the beneficiaries are involved in the development of their water supplies. To enhance community involvement, the beneficiaries should be involved in identifying their problems, and finding possible solutions.

In the Programme area, the beneficiaries are involved in site identification, planning, design, implementation, operation and maintenance, management and finally, monitoring of their system. They are also involved in choice of technology and service level. The technology used should be acceptable to beneficiaries, affordable, reliable, easy to operate and maintain.

Real involvement is a partnership approach. It involves sharing of information, consultation, discussion and negotiation, not imposition of externally developed ideas. If the community is to feel that it truly owns the system, it must be fully involved in all the project phases. True involvement means decision making, people will not use and support facilities that do not meet their needs and capacities. Projects must therefore consult the various user categories (men, women, rich, poor, etc) on what they want, find out whether they are ready to contribute, inform them about the options and choices they have and their costs and benefits, and then jointly develop the scheme.

6.5.2 Planning and design

This process involves collection of information or facts, analysis of the situation, identification of felt needs or problems. Beneficiaries can provide information concerning major water sources and problems, water habits, taboos and economic conditions. Such information which is important for planning can only be acquired from the local people by involvement in dialogue between the beneficiaries and the water experts.

Community participation at the planning stage involves discussions with leaders at all levels and the target group. During the meeting, beneficiaries are made aware of their rights and responsibilities with respect to the proposed water project. They discuss about the environment, water sources and the social and economic benefits of the proposed water project.

Previously, the beneficiaries were involved in siting of their water points through several meetings, starting at the location, sub-location and village level. During these meetings they were informed on the need to form a water committee and identify suitable candidates for training as attendants for the water schemes. The beneficiaries were also involved in investigation of shallow wells by use of hand auger drill by providing the labour. In design, the community was involved in site selection, intake site protection and determination of uses for the water scheme.

In the new approach the beneficiaries apply to the District Water Engineer (DWE). The DWE and where need be with the Programme together with the beneficiaries carry out investigation and feasibility studies of the requested scheme. At this point the beneficiaries are briefed on the different technology choices, the estimated construction, operation and maintenance costs. Other matters such as the advantages and disadvantages of different alternatives are also discussed. The 'information packages' will play an important role here in giving the necessary information

6.5.3 Implementation

In Phases one and two nearly all the construction was carried out by the Programme. In the third phase the use of local artisans (contractors) with the Programme providing materials was mainly used. In the fourth phase full contracts will be used. The use of existing capacity in implementing the Programme has several benefits. One of them being capacity building within the community.

With a well organized and trained committee, implementation is done in partnership with the community members. During construction, the community is involved in providing both skilled and unskilled labour and also contributes funds. Previously, the level of community involvement depended on the type of water system. For shallow wells they dug down to the water level. An artisan then completed to the required depth, constructed the slab and installed a pump. In spring protection, the community cleared the site, provided local material and labour and an artisan then completed the construction work. In boreholes, the community role was limited to clearing the route to site and digging mud pits where necessary. When the water supply happened to be a piped scheme, the beneficiaries dug trenches, assisted in pipe laying and provided labour as required.

For a long time it has been assumed that the community is very poor, thereby under estimating the capacity of the beneficiaries to afford to contribute to the improvement of their water scheme. With the demand driven approach the beneficiaries are expected to contribute a certain percentage of the total construction cost. The percentage will depend on the existing water supply coverage and the ability of the community to pay. Any labour or material from the community will be included in assessing this percentage. The community contribution and the mode will be agreed before commencing the actual construction and an agreement drawn and signed by all concerned.

6.5.4 Operation and maintenance

After the water supply system is completed, the beneficiaries are expected to own, operate and maintain some of them. For community managed water points, village level maintenance systems are used. This ensures that the systems are taken care of by trained attendants. It is important for community based projects to use technology which is available, affordable and replicable. The spare parts should be also easily available.

Hand pump wells

The Programme has gone through different maintenance structures for hand pumps, before the VLOM (village level operation and maintenance) system presently in use. At the inception of the Programme, mobile teams (two Land Rovers with project staff) went round the Programme area to repair and maintain the water points. This system was found to be expensive, unreliable and non-sustainable.

The second step was to train local artisans to work as area pump repairmen from the community and they were provided with a tool kit and a bicycle. After training, the artisan went back to their respective water committees, who hired them whenever the maintenance need arose. Although this system had advantages over the mobil system, it was still time consuming when the location repairmen travelled long distances to effect repairs and acquire spare parts at the Programme office in Kakamega.

The third step involved the selection and training of women pump attendants who were trained in all aspects of operation and maintenance of VLOM had pumps (Nira AF 85 and Afridev pumps). The main results have been increased self-reliance and savings in maintenance costs. The locational repairmen and women pump attendants have continued to play a major role during the maintenance process while the mobile teams have played a supportive role on major corrective maintenance. The DWE and other local organizations will in future be expected to play a more supportive and supervisory role.

Sparepart distribution system

In order to carry out repairs, spare parts are necessary. They should be affordable, available and easy to obtain. Previously water committees used to obtain spare parts from the Programme, but they found this being difficult and time consuming due to the distances involved. Recently the programme has started a spare parts distribution system which involves private hardware shops and women groups. In the beginning the dealers will get spare parts from the Programme and stock them for supply to the water committees. It is expected that in future the dealers will be able to get spares straight from either the agents or the manufacturers, some of the manufacturers being WECO (Western College of Arts and Applied Sciences) in Kakamega and East African Foundry Works Ltd, in Nairobi. At present there are five hardware shops and one women group distributing spare parts in the Programme area.

6.6 Handing over

The Programme started without support from the community, which later meant a lot of work in setting up structures which could deal with issues which were important to the beneficiaries. These included land easement and legalization, siting, construction, operation, maintenance and actual ownership of the water supplies. To date the Programme has handed over 3046 water points and 40 piped schemes which include new and those which have been rehabilitated. This number includes 10 community managed pipe schemes. In properly planned community based projects, handing over is not needed as the projects would have been implemented in partnership with the beneficiaries. With the new demand driven approach, the Programme should not be actively involved in handing over, this should be left between the beneficiaries and the contractors. However, the Programme should facilitate the process in conjunction with the District Water Engineer.

6.7 Training

The programme aims at having sustainable water supplies through community participation. For this reason, community training is very important. The objective of community training is to create awareness of better water usage and maintenance of the different water facilities. The communities are also trained in health, sanitation and proper hygienic practices. The community leaders are trained in a 5 day seminar on water borne diseases and health education. The leaders are expected to convey the same information to the communities through different forum.

Water committees

The water committees are trained in book-keeping, leadership skills, fund raising techniques, operation and maintenance, development of well surroundings, health education etc. It is important for the water committee to understand its role as it is the body which oversees the community water supplies.

Pump attendants

For each water point, two pump attendants are selected by the community and trained in pump maintenance, health and hygienic education, cleanliness at water points etc. The pump attendants are mainly women, who after the 2 week training course, go back and take care of the water points.

Repairmen

Repairmen and contractors are selected by the communities and trained in pump repair, installation, well construction etc. The repairmen and local contractors are hired by the communities as the need arises.

Extension workers

Extension workers are trained in communication skills, techniques of community mobilization, entry into the community and report writing. At the end of training, the extension staff are well placed to be agents of change in the communities.

6.8 Community management

6.8.1 General

To have effective community management, the level of community participation should be high. The beneficiaries should be involved in decision making and in all other phases of the project development. During the preparatory stages of siting and construction of the water supply, the affected communities elect a water committee which represents them in all issues of management and operation of the water supply. The duties of the water committee include collection of funds for development, operation and maintenance and organizing labour and materials for construction. The committee registers with the Ministry of Culture and Social Services as a Self-Help Group.

The committees are encouraged to raise funds for maintenance of the water facility. However, there is no set pattern for this fund raising. Some committees have raised funds

whenever the facilities broke down and they needed to pay for the repairs, others have contributed monthly. Funds collection and usage has been one of the major subjects addressed during seminars and organized community meetings. Some of the other sources of funds include commercial projects undertaken by the water committees such as fish farming, tree nurseries, brick making, block making etc. The management of such funds is usually left to the committee. On the management and usage of funds, the committee keeps records and issues receipts. Also a register of all the consumers is kept to monitor all those who are contributing and how funds are used.

Community management lays emphasis on community control and management of productive resources, and therefore goes further than mere participation in the planning and implementation of projects. Every community develops systems or mechanisms by which its members capture and use locally available resources to meet individual and collective needs. Such resources include land, water information, technology, money, labour and creativity.

6.8.2 Water points

Out of about 3195 successful water points constructed with the help of the Programme, a total of 3046 have been handed over to the water committees on behalf of the beneficiaries for ownership, management, operation and maintenance. However the Programme has continued monitoring the performance of these water points.

It is important that the water point technology used should be upgradable to other water supply systems with a higher service level or a wider coverage. An example in the Programme area is the Sio Port project which was started as a water point and later was upgraded to a piped scheme by the beneficiaries.

6.8.3 Piped schemes

A total of 10 community projects have been completed and handed over to management committee for ownership, operation and maintenance. The committee are responsible for:

- Maintaining bank accounts
- collecting funds from the consumers
- educating the community on their roles in the water supply, health education, environmental and conservation
- formulation of by-laws to govern the management of the water supply
- expansion of the water supply
- supply of water to various consumers
- employing of project staff.

6.9 Conclusion

In the beginning, the programme did not involve the beneficiaries, the local agencies and relevant Ministries staff in it's activities. Also a supply driven approach was initially used which has gradually changed to a demand driven approach. In addition maintenance procedure and spare part distribution has been improved. It is hoped that with these improvements and changes, the Programme activities will be more sustainable.

7 The HESAWA Experience in Kagera Region — Tanzania

By George K. Mugenyi

7.1 Introduction

The existing rural water supply and sanitation policies in most African countries of providing the facilities as a free basic service has created certain contradictory elements. (Muscarine has, A, 1984). In most cases you find that the communities are completely excluded from the programme. the development of water and sanitation projects is regarded as the business of the government. Operation and maintenance, one of the corner stones for sustainability, is often given low priority. What is critical here is the inadequate capacity in initial funding, manpower, equipment and infrastructure of the agencies involved to cope with the expanding water and sanitation programmes.

With these emerging circumstances, there is need for developing a system in which the communities can realistically play a role in development, operation and maintenance of their own projects so as to enhance the spirit of projects sustenance among the communities concerned. Fortunately in the recent years there has been growing trend this direction. Tanzania forms a good case study where there has been a great deal of political will to provide water for all but with very little community involvement. However, most of the donors involved in the rural water supply and sanitation projects are pressing for a change in order to give greater responsibility to the communities. The HESAWA programme started to implement the rural water supply and sanitation projects in 1984. The programme experience towards achieving the objective in Kagera region is discussed in this paper.

7.2 Brief description of the Kagera region

Tanzania is divided into 21 Regions, Kagera being one them. It lies in the North-Western corner of the country between 1° oo' and 2°.45' South Latitude and 30°.00 and 32°.00' East longitude. On the North borders Uganda, Rwanda and Burundi in the west; Lake Victoria and Mwanza Region in the East and the remaining part of the Tanzania mainland is in the South. The total area of the region is about 28.5 square kilometres. (WMP, 1978). It is divided into six districts namely: Bukoba Urban; Bukoba Rural; Muleba, Karagwe, Biharamulo and Ngara. The Region is the passage of the inter tropical Zone, rainfall is bimodal with the climate modified by altitude and by the proximity to the large water surface of Lake Victoria. The main rainfall period is March, April and may with a secondary peak during October, November and December. The average rainfall intensity varies from 300 to 2000mm per annum. Reliability of rainfall decrease inland away from Lake Victoria. Temperature (Monthly) ranges from 16° to 26°. Over 90% of the inhabitants of the region are directly involved in small scale subsistence level agriculture, with bananas, coffee, tea, cotton and sugar as permanent crops. They own small herds of cattle, goats and sheep. According to 1988 census, the total population of the Region was 1,326,183 with an average growth rate of 2.7%. The possible water resources available for exploitation include ground water, lakes, perennial springs and rivers from which water projects can be developed.

7.3 Water and sanitation projects before HESAWA intervention.

Taking into consideration the non-availability of sanitation package data by then, the water services before HESAWA intervention were as follows: "the majority of the villages in the region are within a kilometre of suitable springs except some parts of Karagwe district where there is a considerable difference in altitude between the villages and sources of water. In these areas people have a traditional way of collecting water; the rain water harvesting is one of the oldest way since the area has rainfall almost the year around. In some parts of Bukoba and biharamulo districts a greater percentage of traditional ground water sources (mainly hand-dug wells) are found. Both pumped and gravity piped water supplies are found in the region. In 1985, the total number of 68 schemes were in operation; about 30 pumped schemes were privately owned; and 38 were owned by the community but run by government. According to the Regional water Engineer (RWE) about 80% of gravity schemes were in good working conditions while 60% of the pumped schemes were partly operation due to shortage of fuel supply, spare part, poor operation and other discuses. (RWE, Kagera 1985). As a result villages they serve reverted to their unprotected traditional water sources; other factors contributed to the failure are:

- Most of springs were unprotected and their upstream catchments were used for cattle grazing and cultivation, the fact which contributed to possible reduction of yield of the sources.

- Water structures like intakes, storage tanks, developed cracks during the subsequent period or disuse.

- Human problems such as abuse from children and curious adults or deliberate sabotage by discontented villagers determined to punish the rest or by selfish ones who steal engine parts, pipes and fittings for their personal use, they effectively destroyed many piped water projects. Following the regional water Master Plan which was completed in 1978, Shallow wells' construction was one of the recommended technology for village water supply. The well programme target was 140 wells per year and started in 1983. For three years consecutive period (i.e 1983 to 1985), only 13 shallow wells were fitted with hand pumps. (1985).

A part from the low producing rate of wells, those which were in use had the following problems:

- Most wells failed completely during the dry season.
- Unsatisfactory sanitation conditions existed around the pump surroundings, in some areas were turned into washing and cattle drinking places.
- Breakdowns of the pumps were reported to the water department, but little attention was given to maintenance. It took sometime for technicians to go to villages to repair the pumps.

In fact, there was no adequate maintenance follow up. In summary the following are the water project completed by the year 1985. Source: (RWE, 1985).

Type of supply District	Pumped projects	Gravity Projects	Shallow Wells
Bukoba Rural	11	2	13
Muleba	6	1	-
Karagwe	5	8	-
Biharamulo	7	1	-
Ngara	9	4	?
Total	38	16	13

7.4 Water and sanitation projects after HESAWA intervention

In 1982, an agreement was made between the Swedish and Tanzania governments on cooperation within the rural water supply, Health Education and Environmental Sanitation programme in three Lake Regions of Mwanza, Mara and Kagera; hence the name of the programme " HESAWA "

The overriding objective of the programme is to improve the health of the people in the rural areas through improved health education, sanitation and water supply and creation of better prospects for social and economic development.

Furthermore, in the water sector, a priority is the development of self-reliance (sustainable projects) in all areas covered by the programme through:

- Continuous improvement of water quality and easy accessibility and availability for various household purposes.
- Improvement of existing water sources by construction or rehabilitation of wells, alternative low cost water supply system and/or electrification of specifically agreed diesel powered projects when no feasible alternative can be developed.

In view of the objectives mentioned, the HESAWA programme started to implement the rural water supply and sanitation projects in 1984. It was not possible to choose a single type of technology for universal application throughout the region. Different types were found to be inappropriate to some villages. The order of preference (especially in water supply) in choosing the type of supply for a particular village is reliability.

- Use of locally available materials for construction and to avoid heavy reliance on imported materials such as fuel, spare parts etc.

- The level of technology is such that it maximizes the option for participation in construction, operation and maintenance.

- The project and its service level is in accordance with the expressed needs of the community.

Protection of traditional water sources and construction of shallow and medium deep wells formed the basic technological approach but in the course of the programme

implementation more technologies are used. To date, the following technologies are in use in the region:

- Gravity fed water supply systems
- Rainwater harvesting systems
- Improvement of traditional wells
- Construction of shallow, medium and deep wells
- Hydraulic Ram systems
- Solar pumping systems

The following projects have been completed since 1985 to 1992.

Type of Supply District	Pump Project	Gravity Project	Shallow Wells	Rainwater tanks	Rainwater jars	Traditional Wells	Improved latrines	Village Health Workers
Bukoba(R)	2	6	145	5	-	59	153	102
Muleba	1	2	16	-	-	12	115	14
Karagwe	1	6	17	58	241	13	80	15
Biharamulo	2	2	123	5	24	101	277	133
Ngara	1	3	12	-	-	7	-	19
Total	7	19	313	68	265	192	625	283

7.5 Community involvement WSS project management

Recognizing the lack of sizeable investment in rural areas,the government has emphasized community involvement as the only possible means to reach the objective of the "International Drinking Water Supply and Sanitation Decade." It is seen as the only way of sustaining the water services which is the intended goal for both the government and rural communities. As it was pointed out in their report (Briscoe, J. & Ferranti, D. 1988) that it is vital that all particles involved in efforts to improve community water supply; government agencies, donors, advisors community leaders, and residents; recognise and adhere to the principle that it is the local people themselves, not those trying to help them, who have the most important role. The community itself must be the primary decision maker,the primary investor, the primary maintainer, the primary organiser and primary overseer". The policy of providing water as a free basic social service has placed a heavy burden on the government. As a result the government has carried the financial burden not only of development but also of operation and maintenance. This burden which has steadily been growing as more schemes were coming into operation. It is now increasingly accepted that it is not possible for the central government to run rural water projects; decentralisation is required on the part of government and managerial responsibility is required from the local community or consumers. It does not imply that the communities should do all the work of construction and maintenance but it implies that they should be responsible for managing and making all the important decisions about the provision of their services. And for the community to become incharge of the water projects in the village, the following critical conditions must be fulfilled.

- Communities are involved in all stages of their project.

- The role and responsibilities of the community and the government are clearly defined and obligations are fulfilled.

- The government agency acts as a supporter of the community, not as owner and manager of the water project.

- Contact between the communities and the government agency is through cadres whose primary skills are organizing and motivating communities.

- Government agencies fulfil their limited but vital tasks of motivating, training and technical assistance.

7.5.1 Dimensions of community involvement

The overall objective of community involvement is to gradually increase the beneficiaries involvement is decision making, planning, implementation and maintenance of their water and sanitation projects (White, A, 1981). To increase the knowledge and awareness in safe water provision, hygiene and sanitation measures should be taken to enable each village to plan, build, operate and maintain improved facilities with a minimum of assistance from the central agency. Similarly health education and sanitary improvements, should be promoted using village involvement to ensure sustained village interest and efforts in the improvement of water, health and sanitary conditions in the community.

The above approach is important and the following dimensions should be considered:

- Community participation in decision making.

- Women involvement. As the community members who literally shoulder the burden of fetching and carrying water, they have the most interest in seeing improvements made and sustained.

- Sharing the benefits. Improvements can have different kinds of benefits such as those related to health, time saving; other direct effects (e.g better reliability of service more convenient operation) etc.

- Contribution by beneficiaries to implementation. Contributions by beneficiaries to implement decisions made is pre-requisite for the sustainability of the water and sanitation projects in the villages. This principle encourages the effective use of local resources and eventually creates an initiative for the community to take up the project at the end of the external support. There is therefore a need to revitalize the self-help concept and apply a more systematic approach to this issue.

7.5.2 HESAWA approach to community participation

In order to meet the community participation objectives mentioned earlier, particular attention is given to community participation as follows:

- Decentralizing decision making, planning, budgeting and implementation responsibilities to district and village levels;

- Involve communities to accept and take responsibilities regarding operation and maintenance of their project;

- Improving women's status by encouraging them to actively participate in planning,implementation and maintenance;

- Improving women's situation through improved health and reduce burden of water collection; and

- Promotion of community participation, health education and sanitation through planned coordination of relevant agencies of water, health and community development.

Having the village applied to be phased in the programme, staff of the technical agency concerned go to the village to assess the situation. The assessment is based mainly on felt need, feasibility and cost of the project to be implemented. Together with the community leadership the study is done and design completed by the technical agency. This is followed by preparations for the village to be phased in and actual project implementation.

In order to enhance the sense of ownership among the villagers to be phased in the village should:

- Apply to be phased in the programme;

- Appoint a water and sanitation committee, half of the committee members should be women;

- Open a bank account for operation and maintenance of the project;

- Identify its needs and is assessed by the promotion team;

- be ready to participate during implementation stage and finally manage the project, they are committing themselves by signing a contract;

- Appoint two scheme/project attendants/mechanics from the same village and two care-takers for each water point one of them being a woman;

- Be able to contribute an initial payment of Tanzanian shillings 20,000/= for the water point to the water account.

Among villages with proven willingness to contribute in cash or any kind, those defined as "crisis" villages are given first priority.

On cost recovery; apart from the villager's contributions to meet part of the project costs, they have different systems for financing their projects particularly during the maintenance phase. Existing arrangements for raising funds in the villages are from:

- Contributions from individuals households of an amount fixed by the villagers;

- Contributions from a group of people from the village who are working in urban centres;

- Levy on crops or any other product marketed in the village, cash crops and other agricultural products are marketed through specific agencies;

- Tax system introduced by the local government;

Another area of consideration on the community participation is the ownership of the project. After the scheme completion, a one year grace period is given in order to check and rectify the constructional faults. The Water Committee, Village government leaders and the project attendants are trained on management. Finally, the project is handed over to the Village but the responsibility for monitoring still remains with the local government through the agency concerned.

8 Dodota Water Supply Womens Project Ethiopia

By Amsalu Negussie

8.1 Background

Dodota is a Woreda in the Arsi Region. The total area of the Woreda is about 300 km^2. It is situated about 120 km South East of Addis Ababa and 30 km North East of Asela. The average rainfall is about 600 mm and the area is often stricken by severe drought. Generally the Woreda is poor. It consists of 46 Peasant Associations and three towns, Dera, Huruta and Awash Melkasa.

People used to live in scattered settlements agricultural production was carried out independently by each household. During the Socialist Government, several directives brought considerable changes in the living conditions of the people of Dodota. The most important were the establishment of producers cooperatives from 1979 and the villagisation since 1984.

However none of the directives could solve the area's major problem, the scarcity of water. The population in Dodota has suffered from an acute and continued water shortage. Women used to spend two to six hours, every day carrying water for domestic use.

8.2 Looking for alternative water sources

Many attempts have been made to find water in the Dodota plain. Boreholes had been drilled down to 255 meters and failed to reach reliable aquifers. Ponds were made with different techniques but proved unsuccessful, due to high rates of seepage and evaporation. In 1980 women throughout the country started to establish associations. This created a conducive atmosphere for the Dodota women to meet and discuss their problems.

8.3 The community specials: Women identify their needs

At the meetings the assembled women made different suggestions concerning what they needed such as a flour mill, water and health clinics. While discussing with each other, they soon agreed and stated unanimously that what people in the Dodota plain needed most was drinking water. Nothing was considered as important as this. The peasant women in Dodota had identified their need.

8.4 A Solution is found

With this background the Dodota Water Supply Women's Project was initiated in 1980 and implemented between 1982 - 1986, supplying 56,000 people with safe water for a total cost of 2.38 million Birr.

The Arsi Rural Development Unit (ARDU) was responsible for the project study and implementation. Swedish International Development Authority (SIDA) contributed 86% of the cost and the community covered 14% of the expenses both in cash and labour. The Women's Association coordinated and owned the project.

The scheme involved the provision of gravity piped water supply system to the population of the Woreda from two springs. The project was planned to enable the women of the

woreda to play an active part in the planning execution operation and maintenance of the project. Technically the project was constructed in three phases, with the total of 110 km pipe laying and 10 different types of reservoirs.

8.5 Women's training

During the project implementation, emphasis was given to women's training and through this programme 131 women from the Dodota Woreda were trained to administer and manage the project, keep the books, collect fees and construct and maintain the pipelines.

The Women Association of each village elected course participants from among themselves, on the basis of criteria decided by the Regional Women Association and the implementing organization ARDU. The course participants were to be young literate and neither pregnant nor malnourished.

Three courses were given at the beginning of the first phase of the project, then the 131 trainees continued with on-the-job training throughout the implementation phases.

The main objective of the training was to enable the women to operate and manage the scheme without interference from any organization. The management offices were established at Huruta and Dera. 51 women and two men are now working permanently in the water supply operation and management.

8.6 Operation, maintenance and management

A clear system was designed for the operation and management. Each water point has an attendant who's responsible for the volume of water used by the consumers. The attendants sell coupons of 5 cents which are equivalent to 100 litres of water.

The water meter is connected to all water points and the water consumption is checked against the payment handled by the controller. When consumption exceeds the payment by more than 4%, the attendant is made to pay the outstanding sum unless there is confirmed leakage.

The water attendants work a seven hour/day. All the financial activities are managed through the bank at Huruta where 3 people from the management team have to sign to withdraw money from the bank.

What effect has it had?

The project was evaluated in 1990/91 by 5 professionals from Swedish International Development Authority, (SIDA). The project had been in full operation for 6 years. The Evaluation focused on two questions - what impact has clean water close to home had on the living conditions of the Dodota people, particularly the women - and what has been learned from the project - particularly regarding people's participation, sustainability and replicability.

It Found That:

- The people in the target area now have a reliable supply of safe water
- People are using mor water for both drinking and personal hygiene

- The people themselves believe that their health has greatly improved since the water supply improved. Their children grow better and women are stronger and healthier.

- Women now have more time to perform their other tasks better
- The training of the women employed by the project is seen as very successful

Why did the Project Succeed?

- There was local recognition and acknowledgement of the need for change.
- Responsibility for change was delegated to those most directly affected.
- Jobs and salaries were provided for those taking the responsibility

8.7 Replicability and sustainability

The most important tests of a project are:
- will it last and
- can others copy it?

It has lasted nine years now, safe water is still flowing for the women (and their families) at dodota. It has also been copied. The principles underlying this project have been taken to other towns in the area - supplying water to the town of Gobessa, and a second project now is underway in villages around Tereta. Both projects are funded by Water Aid. and aims to continue working this way. Recently it approved its largest ever single project - a 7 million Birr gravity scheme to supply over 50,000 people around Iteya (also near Aseia) with safe water. It will be funded through WaterAid and by the local community - and owned and managed by women.

9 RUWASA Project — Uganda

By Samuel Mutono

9.1 Background

1.1 The RUWASA (Rural Water and Sanitation, East Uganda Project) commenced its main implementation phase on January 1st, 1991. Prior to that, planning and pilot implementation had been going on for 1 ½ years.

1.2 The formal agreement between the Governments of Uganda and Denmark was signed on January 21st, 1991. The Danish government has committed a total of 209 million. DKK, equal to approximately 35m. US dollars, to be spent during the first 5 years. At the end of this period the two governments will decide if the project shall continue another 5 years as planned. The Uganda government's contribution, which is estimated to be 6 per cent of the total project cost, includes: Staff salaries and allowances, drilling equipment, workshop facilities and office space.

1.3 The project covers the 8 districts of Mukono, Jinja, Iganga, Kamuli, Tororo, Mbale, Kapchorwa and the newly established Pallisa District. The area of the 8 districts is 21,500 km^2, which is 11% of Uganda and the present (1991) rural population is 4.18 million which is 25% of Uganda's total population.

1.4 The project is implemented by Uganda Government institutions, of which the Ministry of Natural Resources is the lead Ministry. Other ministries directly involved comprise:- The Ministry of Local Government; The Ministry of Health; The Ministry of Women in Development, Youth and Culture; and The Ministry of Finance and Economic Planning.

The consulting firm Carl Bro International A/S is providing technical and managerial support in association with I.Kruger A/S and DanEduc Consulting.

1.5 The following works are anticipated:

- Drilling 4,359 deep boreholes
- Rehabilitation of 1,116 existing boreholes
- Excavation of 2,376 dug wells
- Hand auguring of 1,095 boreholes
- Protection of 2,182 natural springs
- Construction of 200 rainwater collection units
- Construction of 2,000 pit latrines at schools and clinics
- Establishment of production centres to produce, sell and distribute 500,000 million sanplats for household latrines.

9.2 Project purpose and objectives

- General Purpose: Improve the quality of life in the Project area through a sustainable reduction in water related diseases.

- Specific Purpose: Immediate objectives

  a) Establish sustainable protected water supplies, sanitation facilities and hygiene awareness in the project area (largely under the control of project although also heavily dependent on communities)

b) National water and sanitation sector institutions strengthened

- Human Resource Development
- Provision of physical facilities

c) Reduce the burden of work involved in collecting water

General Consideration:

- all three components (water, sanitation and hygiene) have to be successful in order to break the link between pollution and disease
- the communities have to feel that they own the facilities in order to ensure sustainability
- the coverage of the three components has to be high enough in order to achieve the desired health impact.
- Continually balance the need for physical outputs against the need for institutional strengthening.
- Physical and organisational quality is more important than quantity

The Ruwasa definition of sustainability is the ability of the project outputs and objectives to be maintained after project completion.

9.3 Strategies to ensure sustainability

1.6 Giving O & M high priority from the start:
- Defining clearly from the start that this is the beneficiaries responsibility
- Holding specific meetings at various levels to discuss O&M
- Requesting for financial commitment before the start of implementation(initial spare parts kits, contracts with mechanics)
- Selecting water source caretakers and handpump mechanics before construction and training them during construction
- Selecting and training committees from District to village level

1.7 Using and developing existing institutions:
- Administrative and Political levels (Resistance Councils)
- Staff from relevant Departments/Ministries and Districts
- Training institutions by collaborating where necessary in modifying the syllabus to suit field situation, providing ground for field training and training project staff e.g Nsamizi social and Community Development Training Institute, Management Training and Advisory Centre.
- Uganda Polytechnic (sent proposals for modification of syllabus) Makerere University (syllabus under discussion/industrial training offered) Technical Institutes- syllabus to include Hand pump technology (under discussion industrial training offered) Nsamizi Community Development Institute School of Hygiene.

1.8 Promoting Community Participation and Sense of Ownership:
- Early involvement of the beneficiaries including village inventory/baseline surveys)
- Information to communities on roles responsibility
- Contribution in cash or kind

- Involvement from start e.g selection of sites, committees; handpump mechanics and now community health workers (CHW)

Needing further attention to enhance sustainability
- quality of mobilization
- concentrate/give priority to activities at community level e.g training of village committees (3-5 hours too short) and performance of the committees.
- Building problem-solving capacities and confidence in communities
- designing mobilization procedures based on each communities existing circumstances
- formal hand over of facilities to communities

1.9 Promoting the role of Women:
- Having women involvement and representation at all levels
- At least three out of six members at the village committee should be women
- At least one out of two caretakers should be a woman
- At least one out of two Village CHWs should be a woman
- Deliberate effort to give preference in recruitment/training of women at various levels including Hydrogeologists and Engineers.
- Having a Senior Women in Development Officer heading the project's monitoring unit
- Encourage/develop women groups in casting of sanitation platforms (income generating).

Needing further Development and emphasis to enhance sustainability
. Monitor project activities by gender
. Gender sensitisation seminars and in training courses
. Promotion of women hand pump mechanics
. Further review and development of teaching and Project Support Communication materials/medias to avoid preservation of stereo-type sex roles.

1.10 Using affordable and Maintainable Technologies:
- Improvement of local latrines with sanitation platforms/slabs
- Based not only on capital cost but also taking into consideration the operation and maintenance cost. In order of preference:- Spring protection; Borehole rehabilitation, Hand auger wells, Dug wells, New deep boreholes and Gravity piped supplies.
- Selection of hand pump U-III (Uganda version of the Indian Mark III pump)
- Standardization of equipment

To be given further attention to enhance sustainability
- Shallow well option handpump
- Rain water harvesting schemes
- Difficult areas for Latrine Construction (water logged, unstable soil and rocky ground).
- Quality of construction
- Developing water quality standards tailored to the project area.

1.11 Using an objective oriented approach (Designed to achieve the ultimate purpose of the project rather than focusing too much on inputs and activities - means to the goal)

Includes major software components:-
- Community mobilization which ensures the community members are involved and motivated

- Human Resource Development for the development, implementation and evaluation of all project-related training in coordination with others e.g. Environmental Health Unit (AMREF)
- Project Support Communication educational and information messages using Print media, Radio and now Drama, Songs and Video. Drama presentations reach a very big audience (over 500 a show) and have been received very positively.
- Provide comprehensive coverage to achieve the health impact: 70% of the population with access to protected water sources and 50% using hygienic latrines by year 2,000 and 2,005.
- Contains a major Hygiene Education element: 80% of the final year primary school pupils, aware of link between water, sanitation and health and 70% of the population practice improved hygienic behaviour by year 2,000 and 2,005.

Needing more attention:
- Quality of the activities and outputs
- Putting "customers", especially the community more, in focus
- Encouraging more innovations from all those involved
- Intensified health education for behaviour change and for emphasising the importance of O&M implementation.

1.12 Use appropriate organisation and planning leading to among others:-
- Flexible planning to learn from experience through among others:
  Project Monitoring Unit
  Annual Action Plan up-date every six months
  Plan of Operation up-date every two years
  Joint Review Missions every year.

(Significant changes reflected in the O & M system and Hygiene Education and Sanitation activities since the beginning of the project).

- Technical integration of water, sanitation and hygiene awareness
- Integration of Construction and O & M
- Integration of Local staff and Advisers
- Institutional integration of relevant organisations

9.4 Sustainability Experiences After 2½ Years of Implementation

9.4.1 Immediate Benefits:

i) An in-depth study 1992 of water consumption and utilization in the northern area ("dry") of the project indicate that:
   - All the households are using water from improved sources
   - The walking distance was 1.2 km on average (compared to 2-3 km to water sources in the past).
   - Per Capita Consumption was 23 litres per person per day (Service level is 1.5 km walking distance and at least 15 litres per head per day an average)

ii) However, an in-depth study in a village in the southern part of the project area (relatively wet with many traditional sources) indicated that the average distance to from the protected sources a protected source was about 700 metres. The water use

was low (10 litres per person per day). Traditional unprotected water sources are still used alongside the protected sources.

9.4.2 Functioning of Systems

Reports from the Monitoring Unit revealed the following:

Quarter	Number of Sources Monitored	%Mechanical Functioning
Jan-March 1992	137	97
April-June 1992	109	97
July-September 1992	111	90
October-November 1992	317	93
January-June 1993	605	95

The systems are fairly new. The functioning indicate is mechanical. Yield and water quality problems are reported in about 10% of the water sources.

9.4.3 Care of the Water Source

40 to 50% of the monitored water sources are not well cared for e.g., greasing of chains , stagnant water around the water source unkept surrounding.

9.4.4 Hygiene Awareness and Sanitation

i) A study carried out (November 1992) in two districts indicated that:-

- The strategy of sanitation before water all leaders should have latrines and there should be a 10% increase for the rest of the community before water implementation increased latrine coverage
- the facilities constructed are used
- the beneficiaries know the link between sanitation and health, but the practice is still poor

ii) A latrine use In-depth study (1993) in two sub-counties found that:
- Average latrine use was 95%
- People know the importance of constructing, using and maintaining latrines
- 30-40% of the latrines are not offering privacy and the super structures are poor
- 15-20% had washing facilities near the latrines

9.4.5 Management and Capacity Building

The strengthening of the Government department is mainly by way of the on-the-job training including advisory inputs and some external courses where appropriate.
- The long term adviser are expected to be reduced by half by mid 1994.
- Water and Sanitation Committees are being formed and trained. 1920 Village committees formed and trained.
- Caretakers and hand pump mechanics are being trained especially in O & M and delivering basic hygiene messages. (1677 caretakers and 67 handpump mechanics trained).

- Seminars are held for Primary School Head Teachers, Science Teachers and Parent Teacher Association members (regarding promoting of Institutional Sanitation and Hygiene)
- Community Development and Health Inspectorate staff at District, Count and Sub-count are receiving refresher courses (79 and 85 respectively to date).

9.4.6 The Contributions made by the Project to the National Water and Sanitation sector include the following:

- Participation in preparations of the National Sanitation guidelines
- Project experiences and documents e.g. training materials have been made available and discussions held with up-coming projects
- Water Directorate's strategy for standardisation of Hand pumps and Spare part supply in Uganda
- Developing gender responsive policies in the Ministry of Natural Resources
- Developing of hygiene messages on Primary Schools exercise books in collaboration with the School Health Education Project.

9.4.7 Financial Community Obligations for O & M

i) Out of 30 repairs carried out by end of 1991 in one sub-county, all were attended to within ten days with the average being 4.6 days. 90% of all repairs involved only 5 parts; pump buckets, cup washer, rubber sittings, upper valve and foot valve. The average cost of a repair was about 3,500 U.Shs (about 5 USD).

ii) Under the new O&M system where beneficiaries are expected to give contributions:-
   - 9 pump mechanics have been sponsored for training by the communities partly paying 20% of the training fee (about 33 USD).
   - The collection of funds for fast running hand pump spares and preventive labour costs (about 33 USD for the first year) is underway.

To be further strengthened:-
- Privatisation of activities e.g training and water source construction
- The institutional capacity of District Programmes from decentralisation

9.5 Other Factors Affecting Sustainability in RUWASA

Positive	Negative
• Overwhelming general positive response by the communities e.g. willingness to contribute both in cash and in kind. • Committed community leadership leadership • Back-stopping, support and commitment to the Project from the Government/high authorities. • Donor and Government/ Political Policy and will that supports project strategy (Decentralisation, privatisation Democratisation and Improving the situation of women) • National standardisation of handpumps • Acute felt need e.g. Boreholes in dry area. • Dedicate and committed staff.	• Different prices/ systems by different donors/projects e.g. hand pump prices. • People used to old mentality of free services, especially water. • Socio-Cultural factors e.g. in some areas conception that women will not give birth when they use pit latrines. • Socio-economically difficult areas e.g. semi-urban and those dependant on fishing. • Declining income per capita made worse by increasing Cost sharing in Socio services e.g. Education and Health.

TABLE 1 Implementation Status as at 30.06.93

COMPONENT	status 30.06.93	1995 overall target	% done
1. Community Mobilization and training	58	111	52
- SWSC formed	1920	4078	47
- VWSC formed	1677	9378	18
- Caretakers trained	67	244	27
- Hand pump Mechanics trained			
2. Sanitation			
- Slabs distributed to institutions	849	5771	15
- Institutional latrines	35	577	6
- Sanplats sold	12,739	140,700	9
3. Water Supply			
Spring Protection	595	1314	45
Boreholes rehabilitated	193	405	48
Hand Augured wells	124	620	20
Dug wells	192	755	25
Deep Boreholes drilled	564	1806	31
Total number of sources	1668	4900	34
Number of people to benefit	411,150	1,272,900	32
Number of pumps installed	465	3485	13
4. Total expenditure DKK '000	76,210	209,000	36

SM/17/09/93

10 Introduction to the Water Sector — Eritrea

By Mr. Haile Tesfom

10.1 Country background

Eritrea is located in the Northern part of the horn of Africa between 14° 30" 18° 08" North and 36° 05" - 43° 08" East coordinates. With an area of 124,320 km^2, it has a total population of about 3.5 million people of whom about 80% live on subsistent agriculture.

Being part and parcel of the Sahilian African belt, its topography is generally characterized by embodiment of old faulted and folded precambrian rocks while recent superficial sediments and thick quaternary deposits cover the western and eastern lowlands respectively.

Topographic features of this type coupled with continental pressure changes that influence winds provide temperatures ranging from cool and temperate of 16°c in the high land areas to hot and dry of 30°c in the low lands.

Consequently, monthly precipitation can be characterized as variable, irregular and unreliable. Table 1 shows monthly precipitation for various stations with varying length of records. The country's physiographic ground water zones are generally divided into five:-

1. Central and northern highlands.
2. Western low lands.
3. Eastern escarpment.
4. North Eastern Coastal plains.
5. Denkalia alps and eastern lowlands.

The North - eastern coastal plains, Denkalia Alps and Eastern plains are poor in ground water resources since they are the driest part of the country.

Often complex geological formation makes it very difficult to assess hydrogeological conditions of the country although aquifers generally occur in weathered basement rocks or fractures within the unwithered zones. Environmental degradation, thin soil, poor vegetation cover, over grazing and some of the factors that affect the amount and nature of precipitation and rainfall in Eritrea. June - August are the rainy months in the highland areas. Rainfall in these months is usually torrential and irregular while December - Feb/March in the rainy season of the North eastern and eastern low lands. Thus Eritrea has two rainfall seasons.

10.2 Water Supply and Sanitation

The history of water supply and sanitation services can be divided into parts.

1. Pre-Independence conditions.
2. Post Liberation conditions.

10.2.1 Pre-Independence

Before Eritrea won its independence,much of the existing water supply and sanitation infrastructures are inherited from the colonial periods. The existing systems have suffered

from both natural and man-made damages. Most of them have outlived their design periods because they were constructed between 60-600 years ago and were concentrated in the urban areas especially around government establishments and military installations.

The practice of unfair service continued till the time of independence. Water Supply and Sanitation facilities suffered heavily from old age, bombardment during the 30 years of war as well as lack of proper maintenance. Consequently leakage and breakage rates have been as high as 40-60% respectively.

The rural population were generally forgotten. Not only were denied access to clean water supply but also their problems were compounded by recurrent and prolonged drought and disruption to traditional migration patters and freedom of movement caused by the war. Many lost their lives and properties while others made their way out to various parts of the world the hard way.

About one third of the total population have been displaced crossing international borders. Thus water supply systems under the Dergue regime were in a far worse situation than previous colonial periods. Water being very important commodity and yet there was no access to it.

10.2.2 Water supply under EPL's domain

Water Supply Service unit was set up under the Department of Construction of the Eritrean Peoples Liberation Front (EPLF) in the late 1970s. It was originally established in order to meet water demand of the fighters. In the beginning it was ill-equipped and its activities were limited to digging wells using simple materials. Although its services were meant for EPLF forces, prevailing conditions necessitated to extend services to many displaced persons who ran away from enemy held areas. Hence Service area coverage gradually but steadily increased as more areas and people came under the EPLF's control.

However, ever-growing demand for water with wider area coverage could not much with the limited facilities of dug wells and micro-dams.

Nevertheless, 1984 the Water Service unit made a significant shift of technology from hand digging of wells to drilling deep wells (boreholes) using drilling rigs. Apparently, the acquisition of the rig and other accessories speeded up the provision of water integration of civilian workers into the water service programme of EPLF has also increased its capacity.

But to avoid frequent threats of bombardment drilling crew comprising able - bodied of men and women were forced to work under cover of darkness. Pumps and drilling equipment were serviced in well-equipped and professionally run workshops built under ground and/or tree cover. Vocational training center known as Winna school was established near Nakfa the capital of Sahel (the first region liberated by EPLF).

Graduates of the training center were engaged in surveying mechanical, electrical and carpentry works.

To ensure sustainability of water points, villages pump attendants were being trained.

Between 1977-1991 over 200 wells were drilled, 67 wells were dug, 63 wells were rehabilitated.

10.2.3 Post liberation efforts and challenges

When the EPLF forces entered Asmara, the capital of Eritrea in May 1991, they found former Water Supply and Sewerage Authority and Water Works Construction Authority branch offices of the previous regime poorly organized, staffed and ill equipped to undertake construction or rehabilitation of water programme activities in the entire country.

The Eritrean Government has had to face the enormous challenge of rehabilitation and reconstruction of old and war damaged water supply infrastructures.More over resources could not match demands.

Cognizant of the crucial importance of Water Supply as well as soil and water conservation in Eritrea, the government has given this sector one of the top national priorities. As a practical measure Water Resources Department has been separated from the Department of Construction and raised to a department level. And recently it has been restructured as part of the Ministry of Energy, Mines and water Resources but maintaining its internal structure and autonomous functions (see table).

Water Resources Department is the principal Government organization in Water Resources development in the country. It is responsible for the planning, implementing and monitoring both urban and rural water supply and sanitation facilities.

Asmara, Assab and Massawa are autonomous but there is close technical cooperation with Water Resources Department.

Organizational structuring and implementation and management capacity of the Department are still at the initial stage. At present it has engaged itself with internal reorganization, staffing posts as well as decentralizing itself at regional levels.

Until the process is completed, it will obviously cause considerable pressure on its capacity to conduct detailed national need assessment, planning and implementation.

10.3 Ongoing activities and expected results

The process of institutional management capacity building in terms of staffing with capable and competent personnel and logistical supports is steadily progressing.

As a move toward decentralized management approach which is primarily aimed at increasing managerial capabilities of the nine regions of the country, Water Resources Department, with the assistance of Eritrea Inter Agency consortium (EIAC), selected, trained and deployed 27 field workers - three in each region.

By profession they are surveyors and social animators and their responsibilities include collecting data related water, socio-economic conditions of each village community.

On the basis of the data, they will identify and select project areas. Regional planning will be initiated at this level which will be completed by the head office which is responsible for overall policy, planning, monitoring and evaluation.

10.4 Data collection

Before embarking on water development programme on any scale, Water Resources Department firmly believes that collecting and securing reliable data bank is central to its country goals and strategies.

To this effect, WRD, UNICEF, and EIAC have jointly sponsored to carry out Nation Water Point Survey Inventory. So far, two teams equipped with vehicles, various water equipment and GPS, have been deployed and have already covered a considerable area of the country. A third team is due to be formed very recently. The whole exercise is expected to last about one year.

Another group consisting of two teams have conducted two-month rapid survey on random sampling. This is solely for the purpose of " country situation analysis of women and children of Eritrea" which is currently being under taken by UNICEF.

Quick survey was also carried out in all the main towns of Eritrea. Some of the findings are indicated in the table.

Once the necessary data have been collected WRD is envisaging to embark on the following activities on a larger scale.

- Assessment of the country's surface and ground water potential for various uses.
- Research and studies of drainage systems/water sheds.
- Assessment of soil and water conservation to overt or minimize drought occurrences
- Rehabilitation of existing water supply and sanitation projects
- Construction of new water supply schemes

10.5 Rehabilitation and construction

WRD is engaged in the following construction activities:

- Well drilling
- Well digging with wide diameter
- Construction of micro-dams
- Construction of check-dams
- Rehabilitation of existing Water Supply Systems
- Construction of small scale distribution system

Using the existing seven rigs and other available resources, 500 boreholes have been drilled and number of hand dug wells but small number of micro dams have been constructed since liberation.

Medium and minor rehabilitation activities of distribution systems of 15 towns and peri-urban areas have been carried out. Similar rehabilitation programme has been undertaken in the rural areas too.

NGO's like Eritrea Catholic Secretariat (ECS) Lutheran World Federation (LWF) Kalehiwot etc. have also been actively involved in the water sector. Bi-lateral Agencies such as GTZ and the Italian Cooperation have also been involved.

10.6 Satellite imagery

The lack of a working aerial photo mosaic of the country has hindered effective planning and implementation of water supply and sanitation development projects. Under present condition, using satellite imagery appears to be the only way to overcome this problem. Experts from the Open University are working on it and a complete map of Eritrea is expected to be produced in the near future.

Some aerial photo graphic survey undertaken during the Italian Colonial period have produced some images and are available at the WRD for reference.

10.7 Training

Training both at home and abroad is perceived to be one of the ways of strengthening WRD's institutional and management capacity. Short training programme was given to Surveyors and social animators while training on management was given to senior head office staff by an expert on the subject from England. A couple of professional staff have been sent abroad for further education.

WRD and UNICEF have agreed on joint plan of action to train 100 village level pump attendants within the next 3-4 months.

10.8 Operation and maintenance

Efforts are being made to help village communities manage their own water supply schemes through on the training programme during construction. Sometimes selected would be pump caretakers are called to the regional capital and given three weeks training.

Results of such training have not been evaluated so far even though it is generally believed that some of the burden of the head office has been shared. However, if the programme is to bear fruit in a satisfactory manner it has to be reinforced and trainees have to be equipped with the basic working tools. Medium and major repair and maintenance works are usually undertaken by the WRD. Further more pumps generators as well as spare parts are supplied by the government.

In the case of urban, technicians areas are employed to take care of routine repair and operation tasks. Supply of off-shore supplies, spare parts and undertaking major maintenance is the responsibility of the WRD. No money is charged for the materials or labour. But fees are collected from water users to cover their running costs (salaries, fuel, stationery etc). In the long run, no effort will be spared by WRD to strengthen both rural and urban water supply and sanitation units to manage their own projects.

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	pa	Yr record
Adi Kaieh	2.5	7.6	25.4	71.1	40.6	38.1	147.3	81.3	25.4	7.6	12.7	7.6	462.3	26
Adi Quala	0.0	5.1	5.1	12.7	22.9	55.9	243.8	203.2	38.1	22.9	7.6	0.0	614.7	11
Adi Ugri	2.5	0.0	10.2	45.7	38.1	61.0	210.8	215.9	40.6	17.8	7.6	2.5	650.2	15
Agordat	0.0	0.0	0.0	2.5	12.7	20.3	99.1	111.8	25.4	5.1	0.0	0.0	281.9	27
Asmara	2.5	2.5	10.2	30.5	33.0	33.0	160.0	152.4	25.4	12.7	10.2	0.0	469.9	53
Assab	10.2	5.1	0.0	2.5	0.0	0.0	5.1	2.5	5.1	0.0	0.0	0.0	27.9	22
Barentu	0.0	0.0	2.5	17.8	22.9	61.0	175.3	154.9	61.0	7.6	0.0	0.0	502.9	18
Kenafena	0.0	0.0	17.8	5.1	33.0	30.5	114.3	37.2	40.6	7.6	0.0	5.1	393.7	11
Keren	0.0	0.0	2.5	25.4	22.9	63.5	132.1	139.7	53.3	2.5	2.5	0.0	442.0	19
Damas	55.9	94.0	10.2	5.1	22.9	0.0	0.0	0.0	0.0	15.2	71.1	68.6	337.8	1
Decamere	5.1	5.1	12.7	25.4	40.6	48.3	182.9	142.2	25.4	5.1	10.2	5.1	508.0	17
Tocombia	0.0	0.0	0.0	0.0	27.9	157.5	297.2	335.3	154.9	10.2	0.0	0.0	985.5	5
Faghena	94.0	121.9	76.2	53.3	38.1	22.9	129.5	111.8	58.4	124.5	76.2	109.2	1013.5	14
Fil Fil	170.2	175.3	132.1	91.4	50.8	355.6	76.2	63.5	22.9	101.6	99.1	147.3	1483.4	14
Ghinda	137.2	94.0	71.1	78.7	71.1	12.7	71.1	45.7	25.4	99.1	55.8	66.0	830.6	17
Massaw a	20.3	17.8	7.6	5.1	5.1	5.1	15.2	15.2	2.5	15.2	17.8	15.2	142.2	35
Merrara	109.2	99.1	111.8	53.3	40.6	30.5	134.6	139.7	40.6	114.3	71.1	104.1	1049.0	3
Nakfa	2.5	5.1	10.2	27.9	25.4	25.4	71.1	101.6	38.1	22.9	10.2	2.5	340.4	19
Om Hager	0.0	0.0	0.0	7.6	22.9	55.9	88.9	221.0	111.8	0.0	0.0	0.0	508.0	5
Tessenei	0.0	0.0	0.0	2.5	7.6	38.1	132.1	142.2	50.8	17.8	10.2	0.0	398.8	18

OBSERVATION	URBAN	PERI-URBAN	RURAL
Total population sampled	217577	77262	7723
Household Sample size	3525	1429	175
SANITATION (Latrine used by household %)			
Cistern flush/Pour flush latrine	14.04	6.09	0.00
Dry pit latrine	33.90	8.89	8.57
Open field	52.06	85.02	91.43
WATER SUPPLY (Source used by household %)			
Piped water system	70.95	18.89	16.60
Traditional open well/pond	22.41	67.81	67.43
Piped system & open well	6.64	13.30	16.57
Waiting time at source %			
No waiting	67.46	75.58	60.57
10-20 minutes	11.12	9.80	13.71
20-30 minutes	9.56	7.00	10.86
30-60 minutes	7.40	3.71	7.43
60-120 minutes	3.77	1.75	4.00
More than 120 minutes	0.68	2.17	3.43
Distance from household to piped system %			
Less than 50 meters	17.90	7.30	30.30
50-100 metres	34.00	33.25	33.33
100-300 metres	17.00	13.60	12.12
300-500 metres	11.27	25.19	7.58
500-1000 metres	8.36	12.34	13.64
More than 1000 metres	11.46	8.31	3.03
Distance from household to traditional source %			
Less than 100 metres	1.25	1.09	4.10
100-500 metres	30.23	43.76	41.80
500-1000 metres	33.86	33.73	41.80
More than 1000 metres	34.66	21.42	12.30
Household paying water supply%	87.29	48.15	41.71
Average per capita water consumption (lcd)	20.07	18.47	14.03

Table 2 Summary of Household water and sanitation survey results (Water Resources Department, Asmara, Spring 1993)
Note: Urban centres are assumed to be towns with populations greater than 5000.
Peri-urban centres are small towns with populations between 1000 and 5000.
Rural centres are small towns and villages with population less than 1000.

Annexes

Annex 1: Speech by M.N. Kariuki, Head NETWAS on the occasion of the Official Opening of the 7th Regional Water and Sanitation Seminar, Nazareth, on Monday 20th September 1993

The Head of Water Resources Development Department
(Local Administration),
Distinguished Guests,
Ladies and Gentlemen.

I wish to welcome you to the 7th Regional Water and Sanitation Seminar. NETWAS invited about 38 participants from Uganda, Tanzania, Sudan, Kenya, Ethiopia and Eritrea. I am happy to report that only one participant from the University of Dar-es-Salaam was unable to attend. All the other participants from the six countries are here with us.

This series of regional seminars was conceived by NETWAS way back in 1987 as suitable forum for exchange of experiences at a regional level. The first seminar which was held in Kenya was actually two seminars in one. Initially a seminar for the water engineers and technicians tutors was held, followed at a later date by a seminar for tutors from the Schools of Hygiene. The reason for this separation was mainly because it was considered that the water and sanitation (health) professionals would not feel comfortable sitting together to deliberate on issues related to the sector. Participants for the two seminars were drawn from Kenya, Tanzania and Uganda.

However since the second Regional Seminar in 1988, the seminars have been inter-sectoral drawing participants from water ministries, health ministries, universities and middle level training institutions. A wider participation was also drawn since 1990 involving participants from the whole of Eastern Africa: Uganda, Tanzania, Sudan, Kenya, Ethiopia and Somalia. Last year's participation was extended to Zimbabwe and Botswana thus covering a total of seven countries. One may ask why these countries outside Eastern Africa had to participate. The answer is that some of these countries have some experiences to offer which may not be available here in Eastern Africa.

One unique feature of these seminars which are normally conducted as workshops is that (i) the seminars are rotated in different countries as far as practicable (ii) the theme of the seminar is changed each time. This has had the net effect of drawing together different personalities and specialists to deliberate on different topics every time.

The theme of this seminar is "Management for Sustainability in Water and Sanitation Projects". This theme was selected out of the recommendations of the 6th Regional Seminar. It also ties with the current trends and emphasis at the global level where management and sustainability of projects are considered as key issues in the water and sanitation sector.

We all know of the emphasis that has in the past gone into spreading the philosophy of community participation. However it is now widely considered that community participation by itself without due emphasis on community involvement at all levels of project initiation, planning, implementation, operation and maintenance cannot ensure the sustainability of the projects.

This seminar which is based on this concept "Management for Sustainability in Water and Sanitation Projects" may not provide all the answers to the many questions associated with this concept. However we do hope to exchange ideas and our personal experiences and that of institutions which we represent here today.

The specific objectives of this seminar are:-

- To share regional experiences related to project sustainability;
- To enhance capacity building of sector manpower;
- To enhance collaboration between training institutions and field staff;
- To promote collaboration among water and health sector institutions;
- To enhance management skills in the sector;
- To promote public information and awareness on issues related to management for sustainability;
- To disseminate the recommendations of the workshop throughout the sector within the region.

I am confident that this seminar will go a long way towards achieving most, if not all of these objectives.

Before I close Mr Chairman I wish now to provide brief background information on NETWAS. As you may be aware NETWAS was established in 1986 at the African Medical Research Foundation in Nairobi. NETWAS was and is still is, part of the global program known as ITN (International Training Network for Water and Waste Management). This program is coordinated by the UNDP-World Bank Water and Sanitation Program. There are four centres in Africa. One in Harare (Zimbabwe), the second in Kumasi (Ghana), the third in Ouagadougou (Burkina Faso) and of course NETWAS.

The objective of the network is to support sector capacity building in training in water and sanitation. This task is enormous. NETWAS is mandated to support the sector in Eastern Africa. Its current support for the sector is in the following areas:

- Organisation of regional seminars thereby bringing senior sector professionals together to deliberate on issues important to the sector;
- Facilitation in the organisation of short training seminars and workshops;
- Publication of a regional newsletter for exchange and dissemination of information;
- Supply of learning materials to institutions including dissemination of other relevant materials;
- Assisting to build the capacity of institutions by sponsoring tutors for MSc courses when the funding situation allows;
- Promotion and support of research in water and sanitation.

NETWAS has in the past tried to strengthen its capacity by establishing national centres or offices in its countries of operation. In 1989 an office was established in Uganda in close collaboration with the government ministries of health and water. A similar office was established in Tanzania in 1990 although this has temporarily ran into sustainability problems due to lack of operation funds. We do however hope that the problem will be overcome soon.

In the case of Ethiopia attempts have in the past been made by NETWAS to establish an office in Addis Ababa with support of the former Water Resources Commission. It is the

intention of NETWAS to revive this proposal and we hope that the Ministry of Water Resources Development and Environment Protection will give this idea its support. We consider that the operation of the water and sanitation network would be enhanced if there was a NETWAS office in Ethiopia to cover Eritrea as well.

In conclusion I wish to thank the Ministry of Natural Resources Development and Environmental Protection which is the host of the seminar and which has been responsible for local coordination in Ethiopia. I wish to request the Head of Water Resources Development Department to pass my message of gratitude to the Vice Minister who has given NETWAS maximum support in its endeavour to organise this seminar. Without the ministry's support this workshop would not have been realised.

One person attempted to provide definitions of a teacher, a trainer, a tutor, a lecturer, a professor and a facilitator. I understand that all of them have different meanings from each other. NETWAS is a facilitating institutions. Even more pronounced is the fact that most of us at NETWAS are students in this subject of management for sustainability. I am sure that I and my colleagues in NETWAS will be just too eager to learn from your field experiences. Thank you for listening.

Annex 2: Speech by Ato Gedion Asefaw —Vice Minister for Natural Resources and Environmental Protection on the occasion of the Official Opening of the 7th Regional Water and Sanitation Seminar, Nazareth, on Monday 20th September 1993

(Local Administration), Ato Hussen Kedir, Administrator of Eastern Show Zone.
Distinguished Guests,
Ladies and Gentlemen.

I am happy to be with you here today to officially open the 7th Regional Water and Sanitation Seminar. I wish to welcome you to this great and historical country of Ethiopia. I hope you will enjoy your stay here while at the same time you will enrich your experiences by personal interactions and exchange of ideas with your colleagues from other countries.

I am informed that this seminar is an annual event whose venue is rotated in different countries of Eastern Africa, bringing together the key players in the water and sanitation sector. This I understand is the seventh seminar in a series, the first one having been held in 1987.

I note with satisfaction that this is indeed an excellent forum for the exchange of experiences at the regional level. Participants some of whom may be visiting Ethiopia for the first time, have come from Uganda, Tanzania, Sudan, Kenya, Ethiopia and the newly accredited state of Eritrea. The participants here today also represent a wide cross-section of institutions including government ministries of water and health, training institutions, NGOs and external support agencies. This is therefore a forum which is rich with varied experiences. In your short stay here in Nazareth you should take advantage of this occasion to learn from each other the development and experiences of the sector in your neighbouring countries. In this way you can be sure to return to your countries better informed of the success and failures in the sector. Indeed you can adopt what you may consider to be the successful management techniques in the neighbouring countries for your future planning activities and try to avoid failures which might be otherwise foreseen.

The theme of the seminar "Management for Sustainability in Water and Sanitation Projects" is very pertinent to the sector in our region. We are aware of the great emphasis and enormous inputs in terms of manpower and financial resources that the governments in this region have put into the development of water resources during the last two decades. Friendly donors have also played a key role in this support especially during the International Drinking Water and Sanitation Decade, 1981—1990.

Yet we still continue to see a lot of projects which have been implemented and either fallen into disuse or are poorly managed. Part of the reason for this trend has been the deteriorating economic status of our countries. But the bigger part has been the lack of suitable or efficient management structures for ensuring efficient running of these projects.

Water is vital for all human activities. Today many people, especially children continue to die every year of water related diseases. In the developing countries there will be increased hardships caused by shortages of potable water due to rising population, water pollution, lack of implementation capacity, rising cost of implementing new projects and deteriorating economies. In some of these countries this situation will even be worsened by irregularities of climate which create drought and floods. All this calls for a concerted effort in optimizing water resources management. New and appropriate policies may need to be

devised and put in place where these are lacking. Vast investments will be needed in the water and sanitation sector. Some of the key issues to be considered include the following:

- Multidisciplinary approach in water management since the latter affects all sectors of the economy.
- Strengthening the capacity of water and sanitation sector institutions. This should include human resources development.
- Creation of an enabling environment where the different players including communities, private sector, NGOs, training institutions and sector ministries are encouraged to take full responsibilities commensurate with their abilities.
- Information dissemination in order to create a mass of well informed and trained professionals. This facility should also be extended to provide vital and important sector information to the community.

This enormous task may not be handled by developing countries alone. Assistance of the developed world will continue to be important if the heavy load on the developing countries is to be made light. This seminar is expected to address itself to some of the key issues regarding project management and sustainability. It will ask itself as to what are key issues which should be considered in order to ensure appropriate project management. Again what are the main factors which would contribute to the sustainability of the projects? Answers to these and other questions will be a great contribution to the development of the sector in Eastern Africa. And even more important will be the fact that, you who play a key role in formulating these recommendations and possible solutions to the underlying problems, will also play a similar role in their dissemination among your colleagues who are not with us here in Nazareth. This I hope, will go a long way towards the enhancement of the sector and ultimately the welfare of our communities in this region.

In conclusion I would like to thank the organisers of this seminar and all others who have made this occasion a reality. These include:

- NETWAS (Network for Water and Sanitation) which has played the lead in role organising this seminar;
- AMREF (African Medical and Research Foundation) which is the host institution of NETWAS;
- UNDP-World Bank Water and Sanitation Program which is the coordinator of the ITN (International Training Network for Water and Waste Management), and I note that NETWAS is part of the ITN;
- the Swiss Development Cooperation (SDC) which has funded this workshop through NETWAS; in particular the Eastern Show Zone administration
- the Administration of Region 4 in particular the Eastern Show Zone administration which kindly allowed this seminar to be organised in Nazareth;
- my own Ministry of Natural Resources Development and Environmental Protection which has been responsible for local coordination and is the host of this seminar; and lastly and not the least,
- the for having found time to attend this seminar.

Your full and active participation will no doubt make this seminar a great success.
Distinguished guests, ladies and gentlemen, it is now my honour to declare the 7th Regional Water and Sanitation Seminar officially open. Thank you.

Annex 3: List of Participants: Regional Seminar in WSS Nazareth, Ethiopia 20—24 September 1993

Name/Title	Institution	Address
Dr. M.A.A. Khadam	Department of Civil Engineering,University of Khartoum	P. O. Box 321, Telephone 75931 Telex 28056 ASHKR SD/22738 KUP SD/ Booth SD, Khartoum, Sudan
Mohammed Elhassan Ellayeb, Deputy Director	National Rural Water Corporation, Ministry of Irrigation and Water Resources	P.O.Box 381, Tel. 22498 8/224011/76528 Telex 22256, Khartoum, Sudan
Mr. Ronald Mugambe Drilling Manager - (SWIP)	Ministry of Natural Resources, Directorate of Water Development	P.O.Box 20026, Tel 0485-21035 Fax 0485-20567/041-221678, Kampala, U
Zachary Bigirimana	Environmental Health Unit, AMREF Uganda	P.O.Box 51, Entebbe, Uganda
Mr. D.W.O. Ongwen, Ag. Chief Health Inspector	Ministry of Health	P.O.Box 8, Tel.20217/20059, Entebbe, U
Mr. Geatano Okello	Faculty of Technology, Dept.of Civil Engineering Makerere University	Box 7062, Kampala, Uganda
Mr. Samuel D. Mutono, Directorate of Water Development	Rural Water and Sanitation project, East Uganda	P.O.Box 20026, Tel. 220560, Fax. 220560 Kampala, Uganda
Mr. Paschal L. Kusare	Ministry of Water, Energy and Mines	P.O.Box 9153, Tel.31433, Telex 41777 M TZ, Fax 35734, Dar es salaam, Tanzania
Andrew Y. Kahesa	Ministry of Health	P.O.Box 9083, Tel.20261/23676, Telex 41 Dar es salaam, Tanzania
G. K. Mugenyi, Regional Hesawa Coordinator	Health through Water and Sanitation (HESAWA)	P.O.Box 1286, Tel.066-23114/5, Bukoba, Tanzania
Tesfom Haile, Project Officer	Ministry of Energy, Mines and Water Resources, Water Resources Department (WRD)	P.O.Box 351, Tel 11 96 36, Fax (291-1) 1 96 25 Asmara, Eritrea
Tekle - G/Meskel	Urban Water Supply	P.O.Box 351, Tel 119636, Asmara, Eritre
Mr. J.N. Gitonga	Department of Civil Engineering, University of Nairobi	P.O.Box 30197, Nairobi, Kenya
Nelson N. Waweru	Provincial Medical H/Q	P.O.Box 2060, Tel 037-41152, Nakuru, Kenya
Mr. W.O. Matagaro Engineer	Ministry of Land Reclamation, Regional & Water Dev.	P.O. Box 1922, Kisumu, Kenya
Mr. Kinyanjui Kaniaru, Ass. Programme Manager	Kenya Finland Western Water Supply Programme	P.O.Box 774, Kakamega, Kenya
Matthew N. Kariuki Head	Network for Water and Sanitation (NETWAS), E.A	P.O.Box 30125, Tel. 501301, Fax 506112 Nairobi, Kenya
James Thuku, Sr. Public Health Engineer	"	"
I.O.Oenga Sr. Public Health Engineer	"	"
Rose Lidonde Ass. Programme Officer	"	"
Theresa Riunge Senior Information Officer	"	"
Mary Munano Information Officer	"	"

Vincent Njuguna Project Accountant	"	"
Berhanu W/Michael Planning Expert	Water Resources Development Department, Ministry of Natural Resources Development and Environmental Protection	P.O.Box 1045, Tel 510455/514725, Fax 61 Addis Ababa, Ethiopia
Melkamu Merdassa Head, Central Region Water Supply Office	Oromiya Natural Resources Bureau	P.O.Box 276198, Tel 166738/653806, Addis Ababa, Ethiopia
Amsalu Negussie		P.O.Box 4812, Addis Ababa, Ethiopia
Ababu Teklemariam	Arbaminch Water Technology Institute	P.O.Box 21, Arbaminch, Ethiopia
Dr. Bekele Kebede	University of Addis Ababa, Gondar College of Medical Sciences, Environmental Health Department	P.O.Box 196, Tel 08-110922 (residence), Gondar, Ethiopia
Atnafe Beyene	Water Resources Development Department, Ministry of Natural Resources Development & Environment Protection: Water Supply & Sewerage Authority	P.O.Box 5744 Tel 185335/610709, Fax 61 Addis Ababa, Ethiopia
Tekka Gebru	UNICEF - WESS	P.O.Box 1169 Tel. 513304, Fax(212) 913- Telex 21566 UNICEF ET, Addis Ababa, Ethiopia
Tesso Mosissa	Chief Monitoring & Evaluation Division Water Supply & Sewerage Authority	P.O. Box 5744. Tel: 185335, Fax: 6117 Addis Ababa, Ethiopia
Moges Akalu National Officer	UNDP	P.O.Box 5580, Tel 515177, Fax 514599, Addis Ababa, Ethiopia
Yetagesse Alemu	Department of Environmental Health Ministry of Health	P.O.Box 5504, Tel 517833, Addis ababa, Ethiopia
Hussein Boru	Eastern Shoa Zone Health Dept. Oromiya Region Ethiopia	
Agnes Masila, Secretary	NETWAS	P.O.Box 30125 NAIROBI
Ferezewde Desta, MONRDEP, Ethiopia	Water Resources Development Department, Ministry of Natural Resources Development & Environment Protection: Water Supply & Sewerage Authority	P.O.Box 5744 Tel 185335/610709, Fax 61 Addis Ababa, Ethiopia
Kelemework Tadesse, MONRDEP, Ethiopia	Water Resources Development Department, Ministry of Natural Resources Development & Environment Protection: Water Supply & Sewerage Authority	P.O.Box 5744 Tel 185335/610709, Fax 61 Addis Ababa, Ethiopia

Annex 4: Seminar Programme

Sunday 19/9/93 am — Arrival of participants in Addis Ababa
pm — Departure of participants by bus to Nazareth

SESSION I

Monday 20/9/93 8:30 am — Registration
9:30 am — Opening
10:30 am — Tea/coffee Break

SESSION 2

11:00 am — (Plenary Session)
Climate setting. Participants expectations.

Presentation of selected case studies

- KFWWSP - Kenya
- HESAWA - Tanzania

1:00 pm — **LUNCH BREAK**

SESSION 3 (Sudan, Eritrea)

2:00 pm — (Plenary Session)

Presentation of selected case studies

- RUWASA - Uganda
- DODOTA - Ethiopia
- ? - Eritrea

4:00 pm — **TEA/COFFEE**

SESSION 4

4:30 pm — (Plenary Session)

- Discussions. Summary of issues related to Sustainability of the projects
- Formation of Country Groups

5:30 pm — **END OF DAY 1**

8:30 pm — Presentation of selected case studies

SESSION 5

Tuesday 21/9/93 8:30 am — (Group Work)
6 Country Groups discuss sector in their own countries.

10:30 am — **TEA/COFFEE BREAK**

SESSION 6

11:00 am — (Plenary)
Group presentations/discussions

1:00 pm — **LUNCH BREAK**

SESSION 7

2:00 pm — (Plenary)
Group presentations/discussions

4:00 pm — **TEA/COFFEE**

SESSION 8

4:30 pm — (Group Work)
4 Groups to deliberate on Management issues
5:30 pm — **END OF DAY 2**

SESSION 9

Wednesday 22/9/93 8:30 am — (Group Work continued)
4 Groups continue working

10:30 am — TEA/COFFEE BREAK

SESSION 10

11:00 am — (Plenary) Management issues
— Groups presentations
1:00 pm — LUNCH BREAK

SESSION 11

2:00 pm — (Plenary continued) Management issues
Groups presentations
Discussions
4:00 pm — TEA/COFFEE BREAK

SESSION 12

4:30 pm — (Group Work)
4 Groups to deliberate on the factors contributing to sustainability
5:30 pm — **END OF DAY 3**

SESSION 13

Thursday 23/9/93 8:30 am — (Plenary Session)
Group presentations

10:30 am — TEA/COFFEE BREAK

SESSION 14

11:00 am — Group Work
Regional Recommendations
Split into 4 groups
1:00 pm — LUNCH BREAK

SESSION 15

2:00 pm — (Plenary)
Group presentations
4:00 pm — TEA/COFFEE BREAK

SESSION 16

4:30 pm — (Group Work)
6 Country Groups
Country recommendations or workplans

SESSION 17

6:00 pm — Closing
7:30 pm — DINNER

Friday 24/9/93 9:00 am — Field visit
3:00 pm — Departure from Nazareth to Addis Ababa

Annex 5: Groups

Country Groups: The country groups deliberated on issues pertinent to their own countries in preparation to prese in a plenary. This groups consisted of participants from each country.

Groups on Management / Sustainability:

Group 1	Group 2	Group 3	Group 4
Zachary Bigirimana	Nelson Waweru	S.D. Mutono	Kinyanjui Kaniaru
Joseph N. Gitonga	George K. Mugenyi	Andrew Y. Kahesa	Ronald Mugambe
Tekle Meskel	James Thuku	Mary Munano	Paschal L. Kusare
Dr. M. A. Khadam	M.E.E. Ellayeb	Tesfom Haile	Theresa Riunge
Ababu Teklemariam	D. W. Ongwen	Wilfred Matagaro	Berhanu W. Michael
Bekele Kebede	Moges Akalu	Tesso Mosissa	Hussein Boru
Geatano Okello	Melkamu Merdassa	Atnafe Beyene	Yetagesse Alemu
Tekka Gebru			

Groups on recommendations

Group B2	Group C1	Group A3
S.D Mutono	D.W. Ongwen	Tesfom Haile
Nelson Waweru	Paschal Kusare	Ronald Mugambe
Tesso Mosissa	Geatano Okello	Joseph N. Gitonga
Zachary Bigirimana	Wilfred Matagaro	Bekele Kebede
Atnafe Beyene	Ababu Teklemariam	Kinyanjui Kaniaru
Tekka Gebru	James Thuku	Mohamed Elhassan Ellayeb
Tekle G/Meskel	Dr. M.A. Khadam	Berhanu W/Michael
Hussein Boru	Yetagesse Alemu	Andrew Kahesa
Theresa Riunge	Mary Munano	Moges Akalu
I.O. Oenga	Melkamu Merdassa	George Mugenyi