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MINISTRY OF WATER, ENERGY AND MINERALS

WATER AND SANITATION SECTOR REVIEW (WSSR)

INTERIM PROGRESS REPORT

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TABLE OF CONTENTS

1) **INSTITUTION AND CAPACITY BUILDING** 2

. 2

1.3 Roles and Responsibilities of Water and Sanitation Sector 2

1.3.1 Roles and Responsibilities 2

LOCAL GOVERNMENT 5

1.5 CAREER DEVELOPMENT 7

1.5.3 WOMEN INVOLVEMENT IN THE WATER & SANITATION PROGRAMMES 7

2) FUNDING 10

2.2 Governments low priority in funding 10

2.2.1 Funding levels in relation to set priorities 10

2.2.2. Recommendations 13

2.3. External Support Agency Investment 14

2.3.1 ESA Investment 14

2.3.2 Related investment policies 15

2.3.3 Recommendations 17

2.4 INABILITY TO ABSORB DONOR FUNDS 17

2.4.1 CONSTRAINTS 17

2.4.2 RECOMMENDATIONS 19

2.6 Utilisation of generated funds at source 20

2.6.2 Existing Government Financial Regulations 20

2.6.3 Recommendations 22

2.8 Accountability of committed funds by ESA's and NGO's . . . 22

2.8.1 Disbursement mechanism 23

2.8.2 Constraints 26

2.8.3 Recommendations 28

2.9 Bilateral consultations 29

2.9.1 Procedures of bilateral consultations 29

2.10 CHANNELLING OF FUNDS 31

2.10.1 Procedures of Channelling of funds to various projects 31

3.1 Uncertainty of the future management of urban water supplies 38

3.1.1 Assessment of the current situation of NUWA 38

3.1.2 Review of the related urban water studies 39

3.1.3 Recommendations 43

3.2 The role of the ministry in view of abolition of SCOPO . . 43

3.2.1 Relationship between urban water utilities and the Ministry. 43

3.2.2 Examine water quality monitoring and surveillance system for domestic water supply 43

3.2.3 Recommendations 43

3.3 Water supply and sanitation joint billing 44

3.3.1 Review of existing studies on joint billing 44

3.3.2 Relevance to other urban areas 45

3.3.3 Recommendations 45

4. WATER RESOURCES MANAGEMENT 47

4.2 Legislation 47

4.2.1 Review of Relevant Legislation 47

4.2.2 Proposed amendments and appropriate arrangement for implementation 50

4.3 Utilisation 51

4.3.1 Utilisation of traditional furrows 51

4.3.2 Proposal for registration 52

4.3.3 Water use practices by traditional furrows 53

4.3.4 Deficiencies on the use of traditional furrows: . . . 53

4.3.5 Recommendations for efficient use of traditional furrows: 54

4.4 MANAGEMENT 55

4.4.1 Existing practice of reservoir operation and maintenance 55

4.4.2 Measures to be taken 56

4.4.3 Efficient ways of managing a basin 56

4.4.4 Existing hydrometeorological, hydrogeological and water quality observation network 58

4.4.5 Adequacy of observation network 60

4.4.6 Proposals on improvement measures 61

4.4.7 Existing information on water sources 62

4.4.8 Recommended areas of information up-dating 64

4.5 Existing conveyance abstraction practice 64

4.5.1 Introduction 64

4.5.2 Abstraction - Conveyance, Practice, Procedure 65

4.5.3 Recommendations 67

4.6 Shared international waters 68

4.6.1 Study of Existing Agreement 68

4.6.2 Proposals as to how best Tanzania can utilise these waters with due consideration to all riparian neighbours 70

4.7 Rainwater harvesting practices in Tanzania 70

4.7.1 General 70

4.7.2 Rainwater harvesting methods 71

4.7.3 Rainwater harvesting from roof catchments 72

4.7.4 RAINWATER HARVESTING FROM LAND SURFACES 77

4.7.5 Deficiencies in rainwater harvesting practices . . . 80

4.7.6 Recommendations for effective use of rainwater harvesting systems 81

5. COMMUNITY PARTICIPATION 83

5.1.2 Suggestions on how Local Government will timely

respond to communities initiatives. 84

5.1.5 Ways of Enhancing Community-Based Management 87

5.1.6 Ways to enable communities to understand and identify external support (such as self help funds and regional development funds) 91

5.1.7 Roles of Community Participation in urban water supply and sanitation 91

5.1.8 Indicators for Community Involvement in Planning . . 92

5.1.9 Areas which require government approval 92

5.2 Community Awareness and Capacity Development 93

5.2.1 Training Needs 93

5.2.2 Promotion and Exchange Skills at Village Level and 5.2.3 Retention of Skilled People within Communities. 94

. 95

5.2.6 Appropriate Training for Sector Workers in Community Participation. 98

5.2.8 Suitable Process of Community Mobilisation Diologue/Information Sharing. 99

6. COORDINATION 100

7. OPERATION AND MAINTENANCE 101

7.1.1 Conditions and Procedures of Empowering the Beneficiaries to be Responsible for Operation and Maintenance of Water and Sanitation Projects 101

7.1.2 Suggestions on ways of sensitising the Community to Conserve and Use Available Water Economically 103

7.1.3 Required Arrangements at District Level to Enhance O & M at Village Level 107

8. STANDARDISATION 110

8.3 DESIGN STANDARDIZATION 110

8.3.1 EXISTING AREAS AND LEVEL OF STANDARDIZATION 110

8.3.2 SUITABLE DESIGNS FOR STANDARDIZATION 111

9. SANITATION 112

9.1 Standards and Targets 112

9.1.1 Sanitation Components 112

9.1.3 Data collection and update data on current coverage . 118

9.4 Promotion 119

9.4.1 Review existing promotion initiatives: 119

9.4.2 Proposed improvements on promotional strategies at decision making and community levels: 121

9.7 Integration. 122

9.7.1 Improvements in the balance between water supply, sanitation and hygiene education and their integration 122

10 PRIVATISATION 124

10.1 Areas of Private Sector Participation 124

10.1.1 Consultancy and Professional Services. 124

10.1.2 Construction 125

10.1.3 Drilling 125

10.1.4 Manufacturing 126

10.1.5 Spares supply and distribution 126

10.1.6 Haulage 126

10.1.7 Servicing 126

10.1.8 Guarding and Security 127

10.1.9 Storage and Warehousing 127

10.1.10 Financing 127

10.1.11 Operation and Maintenance-Management 127

10.2 Regulations (The Authorisation process) 130

10.2.1 Review of existing legislation, codes, procedures and regulations 130

10.2.2 Recommendations 132

11 THE TARGET 2002 (WATER SUPPLY AND SANITATION) 133

11.4 PLANNING 133

11.4.1 Review of Current Sector Plans 133

DRAFT

11.4.2 Sector Strategies Beyond 2002 138

11.4.3 The Target and the National 3 Year RP Plan 140

11.5 MONITORING 143

11.5.1 Measures to Improve On-going Monitoring System . . . 144

DRAFT

BACKGROUND

The review work started in August 1993 by preparing the inception report. The report was prepared by the Team Members with the help of the office of the NPC. The same was submitted on 07/10/1993. After the official submission the team had the task of identifying back-stopping experts for the specialised works within the TOR.

Naturally identifying the experts went hand in hand with preparation of specific terms of reference(TOR) for their employment. Informal contacts were made for those persons known to the consultants, Later on short term contracts were drawn by the NPC for signing backstopping personnel thereby formalising their engagement. Most of the backstoppers are either contracted or in the process of signing their contracts.

WORK PROGRESS

The work started late due to mobilisation and formalisation procedures. However, once these formalities were completed the consultants met regularly in their office accommodation room No. 7 at the MWEM Hqs. The consultants have spent a lot of time making contacts with officers in Ministries, ESAs, NGOs, Private Organisations etc.

So far some questionnaires have been sent out to various offices for information relevant to the Review. A number of experts have been interviewed or are lined up for the same. A number of documents and literature has been perused through from the MWEM and ESAs as well as from other sources.

Drafts have been received from the backstoppers and these have been reviewed and verified by the consultants. The consultants themselves are working in their specific areas of competence. All written parts of the report are included in the draft.

During early January, 1994 the Team leader had an opportunity to visit and assess the severity of shortage water resources in the Pangani river basin. The inter-sectoral mission was called by the MWEM to discuss conflicts between different water users in the catchment area.

FUTURE OUTLOOK

It is envisaged that the study period would have to be extended for up to two months to accommodate the late start. That is the anticipated date for completion to be end of April 1994 instead of the end of February 1994.

The team envisages to make field visit to the Rufiji River Basin Authority in Iringa to familiarize with management of water resources in the area. The visits are planned to be very short and are to take place before the end of the review period. Other areas to be visited are Arusha, Dodoma, Iringa and Mbeya urban centres in relation to the issues of generated funds, institutional and capacity building.

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1. INSTITUTIONAL AND CAPACITY BUILDING

Two completed sections i.e. 1.3.1 and 1.5.3 are presented in this chapter.

1.3 Roles and Responsibilities of Water and Sanitation Sector (WSS) Agencies

1.3.1 Roles and Responsibilities

This section reviews the roles and responsibilities of the various agencies involved in the water and sanitation sector implementation as provided for by the instruments establishing the agencies as well as looking for the overlaps/duplications and the gaps with the objective of streamlining them for improved sector performance.

CENTRAL GOVERNMENT

The Central Government has fifteen ministries and two independent departments concerned with the sector implementation and these are:-

Ministry of Water, Energy and Minerals

According to the recently approved organisational structure the Ministry has three Divisions namely, Water, Energy and Minerals Divisions linked together by the Planning Division and the Directorate of Administration and Personnel. The Divisions are headed by Commissioners and the Units under the Divisions are headed by Assistant Commissioners. In addition there are Units forming arms of the Ministry. These are the Water Advisory Board, Maji Central Stores, Internal Audit, Accounts, Water Resources Institute and the Mineral Resources Institute. The main roles and. responsibilities of the Water Division are:-

- Policy formulation and monitoring
- Provision of water supply in the urban and rural areas including water research, assessment and management
- Provision of low cost urban sanitation services including design and construction of sewerage and drainage systems
- Development and protection of water sources
- Water quality and pollution control
- River basin development

Ministry of Agriculture

- Formulation and implementation of agriculture and livestock development policy
- Coordination of irrigation activities including research, training and information

Ministry of Community Development, Women Affairs and Children

- Community development policy
- Promotion of women awareness and participation in water, health and sanitation in rural areas

Ministry Tourism, Natural Resources and Environment

- Management and control of the environment
- Management of wildlife, forestry and fisheries

Ministry of Health

- Formulation and implementation of national health policy
- Promotion of rural sanitation and health education services
- Promotion of community participation in development
- Control of communicable diseases

Ministry of Lands, Housing and Urban Development

- Preparation and implementation of national land policy
- Preparation of urban master plans and land use plans for Regions, Districts and Villages
- Formulation of Urban Development policy
- Provision of town planning services

Ministry of Science, Technology and Higher Education

- Formulation and review of science and technology policy
- Coordination of technical education and expansion of technical colleges

Ministry of Education and Culture

- Coordination of literacy programmes
- Mobilization and involvement of adult learners

Ministry of Finance

- Negotiation of loans, grants and external assistance
- Preparation of the foreign funded component of the budget
- Initiation of fiscal policies in revenue, expenditure and government borrowing

Ministry of Foreign Affairs and International Cooperation

- Cooperation on legal matters; territorial, maritime and aerial
- International cooperation with bilateral and multilateral bodies

Ministry of Industries and Trade

- Planning and development of industries and industrial infrastructure

Ministry of Information and Broadcasting

- Dissemination of information and news broadcasting

Ministry of Justice and Constitutional Affairs

- Interpretation of statues, contracts and bilateral agreements

Ministry of Labour and Youth Development

- Coordination of workers education vocational training
- Sensitizing youth for participation in development activities
- Control of health hazards of factories and workplaces

Ministry of Works, Communications and Transport

- Development and maintenance of roads, bridges and aerodromes
- Provision of meteorological services and advice on climatic conditions
- Carrying out geophysical studies.

Planning Commission

- Analysis and advice on population structure, manpower skills requirements, and employment generation
- Preparation of a national development plan in which external donors should be asked to assist

Civil Service Department

- Coordination of overseas training
- Formulation of national training policy
- Coordination and control of recruitment and promotion in the civil services
- Training of common cadre staff

LOCAL GOVERNMENT

The Central Government delegated some of its roles and responsibilities concerning water and sanitation sector activities to the urban and local authorities of the local government in accordance with District Authorities Act No.7 and Urban Authorities Act No.8 of 1982. Such roles and responsibilities include:

- Establishing, providing, maintaining and controlling public water supplies and improving water rates
- Prevention of water pollution, and for this purpose rehabilitating, regulating and controlling the use of such water supply
- Regulating or preventing the sinking of wells and providing for the sinking of wells
- Constructing and maintaining water schemes so as to provide water to the people resident in their areas of jurisdiction

DUPLICATION OF ROLES AND RESPONSIBILITIES

- The responsibility of controlling supply and usage of water is collectively shared among different ministries such as Ministry of Water, Energy and Minerals (MWEM), Ministry of Community Development, Women Affairs and Children (MCDWAC), Prime Minister's Office (RDD) Local Government (Urban and District Councils), National Urban Water Authority (NUWA) and River Basin Authorities (RBA).
- Roles and responsibilities are also duplicated in the area of project planning and implementation. The only distinction is made in terms of the size of projects. That is, the Central Government is responsible for large scale projects and the Local Government for small scale projects.
- MWEM, Ministry of Health (MoH), MCDWAC and Local Government share the responsibility of managing sanitation activities at national, regional and district levels.

GAPS IN ROLES AND RESPONSIBILITIES FOR WSS ACTIVITIES

- The national water policy lacks integration on issues of deforestation, irrigation, soil degradation through overgrazing, pollution control and land use planning.
- The Ministry of Tourism, Natural Resources and Environment (MTNRE) does not have a national policy on environment to guide its activities.
- The law is silent about the size of projects which the local government can implement.
- Projects are planned and implemented on a non-integrated manner hereby not attaining the full benefit of the

investment.

- Water and sanitation laws and acts are fragmented and found in different ministries creating implementation gaps.

RECOMMENDATIONS

- Priority of water use must be spelt out clearly in the policy
- Water right review to be more elastic to include revision of rates
- Industries should be encouraged to carry out rain water harvesting schemes as alternative to municipal supplies
- Industries should be encouraged to recycle their water and waste water and be given incentives e.g tax relief on goods produced
- Key development institutions should be allowed to develop and have own water sources
- Women participation in water and sanitation schemes should be enhanced
- Ministry of industries should be requested to allocate more funds to the sector

PROGRAMME IMPLEMENTATION

- Coordination by MWEM prior to project implementation should be recognized and enforced

Operation and Maintenance

- Encourage local manufacturing of spares, chemicals, components
- Encourage cost recovery through appropriate tariff estimates
- Encourage users to own water supply schemes
- Community participation should be inbuilt in project inception through implementation

Pollution Control

- National Environment Management Council (NEMC) should formulate a national policy on pollution control
- Ministry of Industries and Trade should ensure industries do not pollute
- Tools and mechanisms to control pollution at all levels should be provided through legislation

- Outdated laws and minimum penalties imposed on polluters should be updated and revised

- Mount awareness campaign for new industries to reduce pollution

Information Sharing

- Intra and inter-sector information sharing should be promoted

Source Protection

- Ministry of Lands, Housing and Urban Development on the request of MWEM to designate and declare water sources as protected areas.

- In case of land conflicts priority should be given to water conservation.

Sanitation

- Legislation should be revised to spell out more clearly roles and responsibilities of MWEM, MoH, MCDWAC and Municipal Councils.

1.5 CAREER DEVELOPMENT

1.5.3 WOMEN INVOLVEMENT IN THE WATER & SANITATION PROGRAMMES

Women involvement in the water and sanitation sector is rightly stressed in the Water Policy. Women especially those in rural areas are a target group in water and sanitation programmes due to felt needs. As such a participatory approach should be implemented during project preparation. The Review has it that for successful implementation of water and sanitation programmes women must be involved at all stages of design, construction as well as operation and maintenance of schemes. It is only in this way that the full benefits of these programmes would be realised.

Women have tremendous experience in locating water sources, so this should be harnessed whenever a new water source is to be developed. Whereas the technological aspect of citing a source remains that of the trained hydrologist, women's experience should not be ignored.

Health education being an important component of water and sanitation programmes must be targeted to women and will be more effective by engaging women activists to impart this knowledge. Ideally a participatory approach must be followed by "selling" an idea to the target group (facilitator) and evolving a solution together.

The project proponents must provide sufficient information on the pros and cons of the proposed project. Information should be given in such manner that the users have several options from which they can make correct decisions. It should be noted that such

information is critical in making the right decisions as such should be accurate and simple so as to have meaningful implementation of schemes.

Women can be involved in carrying out simple repairs and preventive maintenance of water and sanitation facilities. This can be achieved by proper training and compensation for their time. To facilitate this, women must be in all water and sanitation committees and their representation must be such that they are not marginalised.

In order to have full benefits of the facilities, a system of evaluation and monitoring of impacts must be instituted. The process must assess both negative and positive impacts of new facilities so as to establish whether the programmes have had their intended results, need modifications or adaption.

Sensitisation of the community on women's role in the sector is vital. Consultation with women is important and essential as they know better their own capabilities, strengths and weaknesses. The social-cultural position of women should be considered when planning and implementing projects. The economic status of women should be key to whatever contributions they have to make. It should be noted that women are usually economically weaker than men in any given society.

To increase women's involvement, meetings can be held at times and places most convenient for their maximum attendance. In some cases separate meetings for women and project proponents may be arranged and where necessary to have female organisers, facilitators and leaders to communicate with the target women groups.

Water and sanitation improvements could lead to social and economic gains especially those of women. In any case some of the benefits to be accrued are as follows:-

(a) lower running cost;
(b) improved health;
(c) lower health costs;
(d) higher labour productivity;
(e) free time and energy availed for income generating activities and
(f) improved social status of women.

There is need to give women training related to water and sanitation activities. Whereas this is true at the planning stages it may not be so in implementation. Participatory methodology should be used in monitoring and evaluation process in order to increase women's participation. Training should be planned for all levels. At the national level should include the following:-

(a) introduction to general planning;
(b) management skills;
(c) monitoring and evaluation;
(d) management of water supply and sanitation programmes;
(e) construction of shallow wells, traditional water sources, rainwater storage tanks and jars, latrines;

(f) operation and maintenance of water supply and sanitation facilities;
(g) management of income generating activities.

At the regional, district and village levels items (a) to (d) above apply. However more training should be concentrated at village level.

Training could be effected within the country at ESAMI, CAMERTEC, WRI, NVTP as well as in Folk Development Colleges (FDC). Seminars could be organised centrally where most women convene and discuss water and sanitation programmes. The trainers may include development officers, MAJI and MAENDELEO technicians, health officers and food and nutrition experts from within the district or region. Trainers and facilitators must be subjected to retraining for better performance of their work.

2. FUNDING

2.2 Governments low priority in funding

In 1971 the government launched a Twenty-year (20) Rural Water Supply Programme (1971-1991), intended to provide safe and potable water to rural communities within 400 metres from their homes by the year 1991.

A mid-term evaluation of the Programme conducted in 1981 showed that the 1991 objectives will not be achieved. In 1981 only 8 218 900 out of 19 138 600 rural people or 43.9% were served with potable water. The situation had not improved much by the end of 1992 as only 46% or 9 475 000 out of 20 559 000 people had access to safe and potable water.

Among the reasons for the failure to meet the objectives were shortage of manpower, technology setbacks, lack of clear sector policy and inadequate funding. Major sources of funding the sector has been the Government, External Support Agencies (ESAs), Non-Governmental Organisations (NGOs) and to a lesser extent the beneficiaries themselves. Since the issue of inadequate funding is considered to be among the major contribution for the non-attainment of the set objectives, it is proper to address this issue in depth, particularly with regard to funding levels.

2.2.1 Funding levels in relation to set priorities

In order to understand the Government's attitude towards the sector it is appropriate to review the importance accorded to it under various government programmes and plans.

During the review of the Economic Recovery Programme I (1986/87-1988/89) it was stated that overall the impact of the positive signs of economic recovery have had little impact on the social services (health, water, education) mainly due to the continued decline in government resources to finance them" and that the "Status of water services had deteriorated." During ERP I, little emphasis was put on the Water Sector. For instance, the minimum import requirements for recurrent and investment/rehabilitation set aside for the sector was only 1.9% in 1986/87, 1.7% in 1987/88 and 1.2 % in 1988/89 of the total for all sectors.

During ERP II, (1989/90-1991/92) special attention was put on the social service sectors so as to attain a sustainable economic recovery in the future. Thus an Economic and Social Action Programme (ESAP) was designed specifically to address the areas of social services. ESAP among its major objectives was to rehabilitate the social services by identifying and designing appropriate strategies and programmes that would enhance peoples' participation in the operation and management of these services.

The Five Year Plan (1988/89-1992/93) which almost coincided with ERPII/ESAP (1989/90-1991/92) did not accord the water sector the priority it deserves in the allocation of resources. The water sector was allocated 7.4% of the total government budget in

1988/89, 6.2% (1989/90), 5.7.% (1990/91), 5.5.% (1991/92),and 4.7.% (1992/93). The declining trend clearly indicates the low priority accorded to the sector by the government. Similarly, the same trend is depicted in the Rolling Plan and Forward Budgeting (RPFB) as revealed in table 1. Under RPFB the water sector share out of the total government budget, development and recurrent, is shown (in percentages) in table 2.1.

Table 2.1: Budget allocation to the Water Sector

	1993/94	1994/95	1995/96	1996/97
Recurrent	1.32	1.36	1.58	1.73
Development	6.63	5.77	4.95	4.51

Thus while the recurrent budget is increasing somehow marginally, the development budget is decreasing substantially thereby leading to an overall decline in the sector development.

Having observed the low priority accorded to the sector in the Government plans, let us now examine the actual financial resources allocated to the sector over a period of time. At this juncture it is important to note that the sector suffered more when it came to actual allocations. Thus, for instance, while 6.63% was planned for the sector in 1993/94 in the development budget, actual allocation was only 2.41%

Financial resources allocated to the sector had not been commensurate with the needs of the sector. This is substantiated in table 2.2 which shows that financial allocations for sector development programmes have been dwindling year after year. Over the years, beginning the financial year 1969/70 through the current year of RPFB (1993/94), the government has been allocating an average of 3.9% of its total development budget to the water sector.

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Table 2.2

Government development budget allocation to water sector 1969/70-1993/94 ('000 T.Shs)

YEAR	WATER SECTOR	ALL SECTORS	WATER SECTOR (% ALLOCATED)
1969/70	33 050	676 396	4.89
1970/71	36 835	950 689	3.87
1971/72	41 000	952 214	4.32
1972/73	128 450	1 175 477	10.93
1973/74	105 275	1 484 315	7.09
1974/75	165 252	2 199 204	7.51
1975/76	245 116	2 590 000	9.46
1976/77	286 320	3 742 554	7.65
1977/78	328 002	3 859 991	8.50
1978/79	317 725	5 548 582	5.73
1979/80	454 909	12 690 196	3.58
1980/81	427 219	7 040 796	6.07
1981/82	377 948	6 622 396	5.71
1982/83	316 716	4 816 205	6.58
1983/84	344 783	5 830 000	5.91
1984/85	489 508	6 560 400	6.70
1985/86	317 856	6 828 000	4.66
1986/87	616 596	15 859 273	3.89
1987/88	1 300 881	17 254 958	7.54
1988/89	2 033 820	28 400 000	7.16
1989/90	1 340 354	22 696 000	5.91
1990/91	1 325 008	33 350 000	3.97
1991/92	727 957	19 887 268	3.66
1992/93	650 703	46 246 843	1.41
1993/94	3 272 485	135 923 600	2.41
TOTAL	15 683 853	393 185 357	AVG.3.99

Table 2.3

Sector financial allocation for the Decade 1980/81 - 1989/90

YEAR	T.DH.'000	U$D	EX-RATE
1980/81	427,219	51,472	8.3
1981/82	377,948	46,660	8.1
1982/83	316,716	32,318	99.1
1983/84	344,783	27,148	12.7
1984/85	489,508	27,666	17.7
1985/86	317,856	13,760	23.7
1986/87	616,596	11,812	52.2
1987/88	1,300,881	17,162	75.8
1988/89	2,033,820	21,252	95.7
1989/90	1,340,354	9,244	145.0
TOTAL	7,565,670	258,494	

Government low priority in funding the water sector is also depicted during implementation of the International Drinking Water Supply and Sanitation Decade (IDWSSD) covering the period 1980/81-1989/90. During this period a total of Tshs 15.67 billion was estimated to be allocated to the sector so as to supply water to the backlog of the rural population by 1990.

However, by the end of the Decade a total of only Tshs.7.57 billion was made available. This again indicates the low priority the Government places in implementation of Water and Sanitation programmes despite all intentions or and declarations to provide water to all population within a specific period. Table 3 shows sector allocation during the IDWSSD. It can be noted that when the Decade started in 1980/81, the financial allocation to the sector was US$ 51,472,000. At the closure of the Decade (i.e. 1989/90) the allocation had dropped to US$ 9,244,000.

In conclusion, it can be said that, since the inception of the first Country's Long-term Perspective Plan (1964/65-1980/81), and the launching of the second Long-term Perspective Plan 1981-2000, the Government has invariably been deliberating to supply clean and safe water to its population. However the government's deliberations have always lacked clear and sound policies as regards objectives and strategies to accomplish the desired goal. Government's intentions have not been backed up by adequate resources to finance water programmes with the ultimate intention of attaining the set. The lack of clear Water Policy until 1991 is another proof that the government's commitment to sector development has been at low ebb. The case of Government's low priority is again depicted in the RPFB.

2.2.2. Recommendations

In view of the National Water Policy which stipulates water for all by year 2002, definitely there is need for the government to change its approach towards management and development of water and sanitation sector.

The gigantic National Water Supply and Sanitation programme (1993-2002) prepared by Ministry of Water, Energy and Minerals calls for government deliberate and elaborate efforts to accomplish the programme successfully as planned. The issue of attaining the target by 2002 is dealt with in another chapter and therefore need not be elaborated here. It is however important to note that the 1993-2002 Programme is estimated to cost some Tshs. 445 billion over the 10 years period.

These requirements cannot be borne by the Government alone, however it has to show its commitment by altering the financial ratios allocated to the sector programmes. The average of 3.99% of development funds allocated annually to water sector does not portray the Government seriousness in its own intentions of providing clean water to all its population by the year 2002. There is therefore the need of increasing the water share to about 8-10% of the development budget.

The government should encourage private sector and individuals to invest in the provision of water and sanitation services. The government should sensitise, mobilise and involve the communities in implementing and running of their own water and sanitation schemes.

2.3. External Support Agency Investment

2.3.1 ESA Investment

Since independence, Tanzania has been benefitting significantly from external support or assistance extended to all economic sectors by way of grants and non commercial loans. External assistance extended to Tanzania is in three main forms; Investment Project Assistance, Technical Assistance and Balance of Payments Support. Other forms include food aid and emergency reliefs. During the period 1989 to 1991, Investment Project Assistance accounted for an average of 40% of total external assistance and 27% was allocated each to Technical Assistante and Balance of Payments support.

Total external assistance to Tanzania increased from US$ 670.1 million in 1986 to US$ 1059 in 1991, growing by an annual average of 9.2 % (See UNDP Development Co-operation Report for 1991). The increase is mainly for bridging the serious deficits in the external account and in the Government budget following the economic difficulties the country was facing since the late 1970s. The understanding reached in 1986 with the International Monetary Fund (IFM) and the World Bank helped create good working relations with most multilateral and bilateral agencies.

External assistance to Tanzania is a critical resource input to the economy and has been instrumental in contributing to the Economic Recovery Programmes I and II of 1986/87 to 1988/89 and 1989/90 to 1991/92 respectively. For the period 1987 to 1991 external assistance was on the average about 35% of GDP. Exports of goods and services was on the average only equivalent to 40.3% of external assistance in that same period.

Total assistance as proportion of some macro-economic aggregates

PARTICULARS	1986	1987	1988	1989	1990	1991
External Assistance in mill US$	670.1	814.7	905.5	905.0	956.2	1059.2
Percentage of GDP (%)		27.1	30.9	36.9	46.6	35.0
Experts as % of External Assistance		36.8	37.2	43.7	48.4	35.5

Tanzania receives more than 70% of its external assistance from bilateral sources and 27% from multilateral agencies. According to the UNDP Development Co-operation Report, External assistance disbursed to the sector of Water dropped from US$ 49.6 million in

1989 to US$ 30.298 million in 1990 and US$ 18.478 million in 1991. It is planned to drop to US$ million in 1992. This is a drop by 39% in 1990, 35% in 1991 and a planned drop of 46% in 1992.

The amount of external assistance allocated to water programmes by different agencies and which was reflected in the annual plans of the Government dropped consistently from an equvalent US$ 34.6 million in 1980/81 to US$ 1.7 million and US$ 2.5. million in 1991/92 and 1992/93 respectively. Although the allocations in Tanzania Shillings remained high and increased for several years during the period, effect of currency devaluation reduced the dollar value of assistance considerably. The following Table shows the trend of external resources alocated to the water sector projects approved by the Parliament from 1980/81 to 1992/93. The plan books have not captured all foreign assistance because a significant propotion does not pass through the Government budget.

Countries and agencies which assisted water activities in Tanzania from 1980/81 to 1992/93 include Australia, Austria, Canada, Denmark, Finland, Germany, Ireland, Italy, Japan, Netherlands, Norway, Sweden and United Kingdom as well as UNICEF, ILO, SIDA, DANIDA, EC, ADB, World Bank, UNDP, FINNIDA and UNFPA.

The droping trend is a serious one and should have serious effects to the pace of meeting targets in water supply. Though the reasons for the drop needs further analysis it can not be because of a change in Government priorities. According to UNDP assessment, the country is still facing a growing water demand/supply gap, with only 42.9 percent of the rural population having access to clean water supply, and only 53.6 percent of the demand in urban areas. Great variations exist between regions and between towns, with some places with as low as 11 percent of the people having access to clean water supply. A number of supply schemes are not operating which puts the overall rate of population being served with clean water at less than 25 percent (UNDP Development Cooperation Report - 1991). Though this poor achievement may be explained by a variety of reasons, the decline in external assistance to the sector is certainly contributing to the poor performance.

2.3.2 Related investment policies

The Government of Tanzania introduced in early 1986 an Economic Recovery Programme (ERP), followed by an Economic and Social Action Programme or ERP II that was adopted in 1989. Introduction of these programmes marked a major change in strategies and the style of managing the economy. While before 1986 the economy was managed more on socialist or central planning approach, the 1986 programme supported by the International Monetary Fund (IMF) marked a deliberate shift to a more market oriented and private based economy. Thus, gradually the Government has given more clearer roles to market set principles (consumer and producer prices, flexible exchange rates and interest rates) and the promotion and protection of private investments. On the other hand the government is also advocating tight fiscal and monetary policies.

Economic Recovery Programmes introduced quite significant changes in policy designs and resource allocation mechanisms affecting all

sectors, including the water sector. The Government was required to tighten its expenditures to match its domestic revenue collection. That is to avoid or reduce quick reliance on deficit financing. Further, coupled with increased commercialisation of the economy both the government and the donor community wanted resources to the social sectors, including water, to be made available on condition that the users would, on an incremental basis, make contributions to their construction and operation. Hence the predominance of the principle of user-charges and community based projects in programmes that followed after 1986.

The main policy developments affecting the water sector in particular are:-

In addition to the charges in overrall policy framework users of water in Urban areas should be charged as water is supplied increasingly on commercial principles. The government should refrain from subsidising water activities in the Urban areas.

In order to improve efficiency and the sence of responsibility in managing water schemes, Water supply schemes in the rural areas should be owned by the communities. There must be put in place arrangement to involve the community in construction of water schemes and make it possible the transfer of their management responsibilities to the users or the respective communities. The Government should withdraw from its direct control and ownership of water schemes.

Other policy decisions by the donor community which affect or are likely affect to affect resource flows to the water sector includes the following:-

The donor community consider Tanzania to be highly aid dependent. It is one of the most donor dependence nations. Taking into account the growing budgetary problems in donor Governments and the growing demand for external assistance particularly following the changes in the former Eastern Europe and in the middle East, donors are pressing the Government to explore the domestic sources more. The Government is required to mobilize increased domestic and foreign private capital and to utilise all available resources efficiently.

The donor community place high priority to the development of women and children in all programmes. This is because of the Vulnerability of this group and the fact that women constitutes a major work force in the country.

The role of the private sector and Non Government Organisations(NGO's) should be given increased prominence because they are seen to be more efficient, particularly in handling grass root programmes.

Environmental protection is to be given increased resource allocation. Legislations and procedures ought to be in place to make sure new programmes takes adequate pre-cautionary measures for environmental protection.

Donors are pressing for good governance as a condition for continued and enhanced cooperation. Good governance includes issues of freedom of press, freedom of multiparty politics, protection of human rights and defence of social harmony.

2.3.3 Recommendations

In the process of compilation.

2.4 INABILITY TO ABSORB DONOR FUNDS

In order to understand the topic, we need to define the Key words in the title. The first one is the word inability - which simply means not able or not capable. The other word is absorb which means to take in. Inability to absorb donor funds would therefore mean agencies which are given funds are not able to spend funds allocated to them. It is one thing allocating funds to a project and it is another disbursing funds to the project. In other words, the funds will be spent on a project if and only if the funds are allocated and disbursed to the project.

The Allocations, actual expenditure and balances for the Ministry of Water, Energy and Minerals for 1990/91 - 1992/93 were as follows:

YEAR	APPROVED ESTIMATES		ACTUAL EXPENDITURE		BALANCE	
	Local	Foreign	Local	Foreign	Local	Foreign
1990/91	2,347,991,700	2,555,000,000	2,546,983,000	745,068,071	198,992,000	+1,809,937,929
1991/92	1,786,950,000	1,400,000,000	1,782,023,585	686,127,085	-4,926,415	+713,872,015
1992/93	1,854,546,000	5,696,063,000	1,894,186,824	628,660,778	-49,640,824	+5,067,402,202

Source: Annual Accounts of respective years. (With some adjustments).

It can be seen from the table above that most foreign funds remain unspent. Foreign funds come in three modes of payments. Cash Payments, Reimbursements and Direct to Project Payments. Most of the funds in the Ministry of Water, Energy and Minerals is Direct to Project Payments.

2.4.1 CONSTRAINTS

Several constraints have been identified which hinder or reduce the ability to absorb foreign funds in the country. Some of these constraints are:-

(i) Pledges Versus Disbursements

Of late it has become increasingly clear that there is a wide difference between pledges and actual disbursements. There are donors who disburse only part of what they pledged during the negotiations which appear in the budget books due to their own various reasons communicated or not communicated. The allocations therefore seem to be overstated than disbursements and actual expenditures.

(ii) Estimates Overstated

Some estimates of foreign funds have been wrongly included in the estimate books due to poor record keeping by the Treasury. Some projects which had been completed several years back have continued to appear in the books. This poor record keeping makes the budget overstated than if the estimates had been ascertained with concerned donors.

(iii) Inadequate/lack of counterpart local funds

In some projects, the conditions are such that the donor provides the foreign component, while the recipient government provides local counterpart funds. Therefore, in this case the amount of local funds will determine the size of foreign funds to be disbursed.

(iv) Lack of knowledge on the amount of money committed

The amount of funds committed to a project must be known by project manager who can programme for the expenditure on the project over the given period. In cases where the project manager does not know exactly how much he is going to receive, may lead to spend less than what is available.

(v) Long procedures of tendering

There are projects which must be implemented by a contractor who is selected through international competitive bidding. The long procedure to get the contractor delays the starting of the project, leading to less expenditure in a given year. Most projects under multilateral organs fall under this category.

(vi) Late approval of projects

There are cases when projects are included in the budget before they are approved by donors for implementation. Such approval may take a long time and affect the pace of implementation and expenditure. Some times the project may not be approved within the financial year and hence the funds being unspent.

(vii) Inadequate preparation of project

While the financing package may be ready, preparation for the project take-off may not be ready e.g securing project plot, etc. This may, in turn lead to spending less on the project within a given financial year.

(viii) Late reporting/disbursement of funds

Disbursements of funds is always dependent on project reports. The more regular the reports the more regular the flow of funds. In other words, if no reports flow to the funds, there

will be no funds flowing to the project.

(ix) Inadequate salaries/wages for project workers

Salaries and Wages are very low in Tanzania and this has some bearing on the rate of implementation/expenditure of a project. Such small wages/salaries are disincetive to hard work.

(x) Lack of accounting for goods and services received

Goods and services may have been received, but, may not have been accounted for due to various reasons including missing documents.

2.4.2 Recommendations

In order to reduce the inability to absorb donor funds, the following measures are recommended.

(i) Donors should always try to disburse funds according to their pledges so that pledges and disbursements are the same.

(ii) Accurate figures should be provided in the budget estimates through consultations with relevant donors to minimise the overstatement of the budget.

(iii) The government should provide adequate local Counterpart funds wherever required to enhance the ability to absorb donor funds.

(iv) The amount of funds committed to a project should be known not only to the Accounting Officer but more particularly to the project manager who is going to see the implementation and phasing of the project.

(v) The tendering procedures be reviewed so that they do not delay the implementation of projects as it is the case now.

(vi) The projects to be implemented and included in the budget should be those which have been approved by donors so that once in the estimates, the implementation starts immediately.

(vii) The preparation for the project should be done hand in hand with the financing arrangement, so that once the financing package is finalised, the project implementation starts immediately.

(viii) There should be regular reports from the Project Manager to the Planning Commission/Treasury and the Donor so that flow of donors to the Project is not hampered.

(ix) The Government should review salary/wages so as to enhance the efficiency of both supervisors and labourers. The current salary structure in the country is a disincentive to hard work.

(x) Goods and services received should be accounted for by Ministries and Regions and efforts should be made by responsible officers to get missing clearing documents from the Disbursement Unit of the Ministry of Finance specifically established for that.

2.6 Utilisation of generated funds at source

The Exchequer and Audit Ordinance Cap. 439 was enacted in July, 1961 and the thrust of the Ordinance is to provide for the control and management of the public finances of Tanganyika, collection and issue of public moneys, the audit and examination of public accounts and the accounts of statutory bodies; and for matters connected therewith. Section 4 provides for the control and management of public finances by the Minister and he is answerable to the National Assembly.

Moreover Section 5 provides for the powers of Treasury in terms of issuance or payment of public moneys. As can be seen from above, the powers of the Treasury in controlling the utilisation of the generated funds is absolute. There is hardly a room for utilisation of generated funds at the source, save for a few limited strategic utilities e.g. Central Medical Stores Revolving Fund, Maji Store Revolving Fund and Government Stores Revolving Fund.

2.6.2 Existing Government Financial Regulations

As seen from above the powers of the Treasury are absolute in controlling the utilisation of the generated funds at the source. However, of late, various institutions have been requesting permission to use the generated funds without recourse to the Treasury. In the same vein, it is important to point out that under Local Government Finances Act No. 9 of 1982, Local Government is not spared from the stringent control by the Central Government. Section 6 (4) of the Local Government Finances Act No.** of 1982 stipulates. "All revenues of an urban authority shall be paid into the general fund of the urban authority". Section 7 (4) "Any receipt derived from any trade, industry, works, service or other undertaking carried or owned by District Council either in whole or in part may with the approval of the proper officer be paid into a separate fund to be maintained by industry, works, service or undertaking as the case may be, from which the receipt is derived".

For the purposes of the Local Government Finances Act, the Minister for Local Administration shall be the Proper Officer for all urban authorities and every Regional Commissioner within the region he administers. Moreover, Section 10 (1) of

the Local Government Finances Act provides for grant from the Central Government which is paid annually from the public revenue as being the cost incurred by the district councils on the provision and maintenance of water supply and educational services within the area of the authority. However the costs are determined by the Minister for Finance in consultation with the Minister for Local Administration.

Since the Local Government Finances Act No. 9 of 1982 does not disapply or oust the jurisdiction of the Exchequer and Audit Ordinance Cap. 439 as amended from time to time, the powers of the Minister of Finance to make regulations should also apply to the local government finances.

Section 7 (4) of the Exchequer and Audit Ordinance empowers the Minister to make such regulations or may make directions as may appear to him necessary and expedient for the proper carrying out of the intent and purposes of the ordinance. Moreover, the Minister shall take all proper steps to ensure that directions given under this section are brought to the notice of all persons directly affected thereby.

It is interesting to note that it shall not be necessary to publish such directions in the Gazette. In that context the various circulars and announcements from Treasury constitute directions as per section 7 (1) of the Exchequer and Audit Ordinance. The Regulations are framed generally rather than specifically and accounting officers are expected to issue detailed instructions for their own Ministries, Independent Departments and Regions, and such instructions, once cleared by Treasury prior to issue, will constitute direction as per Section 7(1) of the Exchequer and Audit Ordinance Cap. 439. Currently all the Regulations have been codified in the Financial Order (Financial Regulations) fifth edition published in 1983.

Revolving Funds

Section 17 of Exchequer and Audit Ordinance provided for establishment of Revolving Funds. The same reads "17 (1) whenever moneys are appropriated by the National Assembly to establish Funds, the Treasury may establish Funds to which moneys so appropriated may be credited and from which moneys may be expended for the purpose for which funds were established". Amendment No. 33 of 1969, Section 9 of the Exchequer and Audit Ordinance dispenses with the resolution of the National Assembly to establish the Fund such that it shall be deemed to have been approved by National Assembly where the Treasury so directs. A limited number of strategic utilities have been constituted to utilise generated funds at the source e.g. Maji Store Revolving Fund, Central Medical Stores Revolving Fund etc. Section 36 of the Local Government Finances Act No.9 of 1982 provides for a special fund to be established along the lines of a Revolving Fund, subject to approval by Minister responsible for local administration. But one of the shortcomings, is that the Financial Regulation directs that any surplus profit accruing from the fund shall

be surrendered to the Exchequer.

2.6.3 Recommendations

Revolving Fund as an entity does not fall out of the Government bureaucracy and therefore operates as a department of the government. However, it is observed that the regulation should be amended so that any surplus profit or balance accruing to the fund should be ploughed back to the Fund and not to the Exchequer. The Regulation is within the powers of the Minister for Finance to amend the same. As observed in Section 10 (1) of the Local Government Finances Act, district councils are supposed to be paid annually from the public revenue as being the cost incurred by them on the provisions and maintenance of water supply services within the area of authority. In other words the Treasury has to budget for such schemes, while Revolving Fund could be established to run such schemes. If the generated funds are used directly for operation, maintenance and development purposes at the source, this will lessen the burden of the Treasury to budget for these schemes. The urban water schemes i.e Moshi, Arusha and Tanga are being administered by a Revolving Fund effective this financial year 1993/94. A study carried out by the Ministry on the existing set-ups of these towns proposed the creation of revolving funds for administration of urban water supplies.

Together with the amendment on regulation, the Principal Act, that is, Exchequer and Audit Ordinance, should be amended so that the thrust of the Act, be that any institution which can finance operation and maintenance costs by using the generated funds at the source should be left to go alone either by forming a revolving fund or any other alternative set up. Currently in Kilimanjaro Region they are in the process of forming an organisation which will run East Kilimanjaro Trunk Main. The shareholders of the company are the beneficiaries. The Treasury need not budget for them.

2.8 Accountability of committed funds by ESA's and NGO's

The importance of donor funds to Tanzania can be seen at a glance by looking at 1993/94 development budget which shows that 18% of the total consist of local funds and the 82% consist of foreign funds. As for the Ministry of Water, Energy and Minerals, the proportion is 7% local funds and 93% is foreign funds. But taking into consideration the water and sanitation component in the Ministry's vote, the proportion is 12.7% local funds and 87.3% foreign funds. In any case there is high proportion of foreign funds in the development budget which therefore calls for smooth accountability of these funds and thus leading to efficient and effective implementation of project.

To be able to account for funds committed by ESAs and NGOs implies that funds are budgeted in the government books and fully reflected. But non-governmental organizations would not like government to interfere in their financial affairs thus

the whole the essence of donors passing their money through NGOs is to by-pass government bureaucracy in disbursement of funds to earmarked projects. In fact there is a tendency for donor to channel an increasing proportion of their aid to non-governmental institutions. This contrasts with funds going through Government where it is thought that the disbursement of funds to project is bureaucratic and sometimes does not all reach the intended project. All the same, there is a need for the government to reflect the NGOs funds in the government documents under each sector. By so doing the government will know which areas under Ministries and Regions are favored by NGOs funds. Besides, the government will be in a position to know the future recurrent implications once the NGOs stop funding the projects. It is because of this reason that in the RPFB it is now emphasized that each sector should indicate areas which are funded by NGOs.

2.8.1 Disbursement mechanism

Disbursements of foreign funds is in two stages:

(a) Disbursements of funds from Donors to Treasury;

(b) Disbursement of funds from the Treasury to Executing agency Ministry, Regions or Independent Department)

Disbursement of funds from Donors to Treasury are based on Action Plans prepared by project managers. The Action Plan spells the amount of money to be disbursed each quarter for the whole year. The Planning Commission sends the request for disbursement of funds through the Treasury to the donor. Upon receipt of the Action Plan together with report of previous quarter, the donor disburses the funds. Disbursements of funds from the Treasury to the Executing agency are made by executing agency completing forms TAN 358 and channelling them through the Planning Commission which when satisfied with the information in the forms forwards the same to the Treasury which keeps records of all projects in the country. The release warrant and exchequer issues notification are then prepared by the Treasury and issued to Accounting Officer. The Accounting Officer issues warrant of funds to Head of Department (in case of department) and to Regional Water Engineer (in case of a Region). The warrant of funds is an authority to spend the amount stipulated therein. The Head of Department or the Regional Water Engineer in this case is called the Warrant Holder. The Regional Water Engineer releases money to the project/or Project Manager.

REPORTS AND ACTION PLANS:

Disbursements of funds is based on Action Plans and Reports. The action plan gives the activities to be performed and the corresponding expenditures to be incurred in a specified period. The purpose of the reports is to gauge the expenditure against the physical performance. The purpose of the report is to ascertain that:-

(a) Execution or project implementation is taking place and that costs are being kept within budget limits.

(b) The Execution or implementation of the projects is within the action plan and that all financial regulations are followed.

(c) The Accounting Officer is aware and monitors both the physical and financial performance of the project.

The subsequent disbursement of funds to Project is normally dependent on progress reports of the previous quarter. Timely progress reports will mean timely disbursement of funds

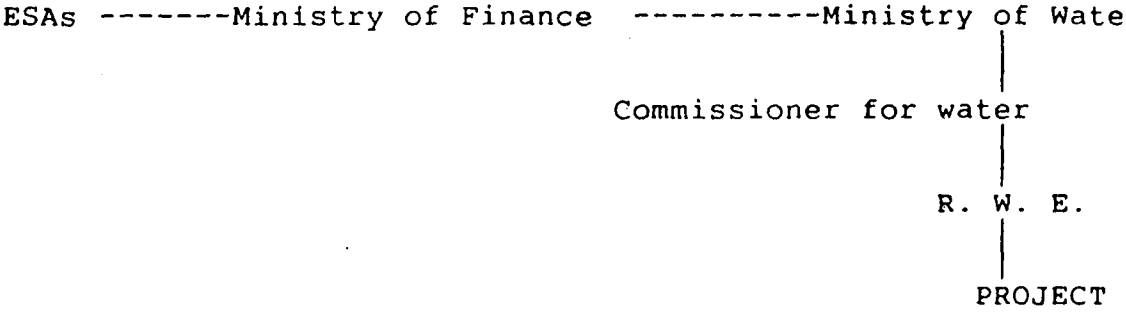
C-FUNDS

The release of the first quarter is effected against the Action Plan while subsequent releases are based on Action Plan and progress reports of the past quarter.

REIMBURSABLE FUNDS (R)

The Release of the first quarter is effected against the Action Plan, while subsequent releases are based on the action plan and reimbursement claims as submitted by implementing agencies for funds already spent. The main condition for reimbursable funds is that expenditures must be made on items agreed between the implementing agency and the donor.

The flow of disbursed funds (C, R) from the ESAs to the project is as follows:-



DIRECT PAYMENTS (D-FUNDS)

These are goods and services sent directly to implementing agencies/projects. The Direct Payments usually come as goods, cash or technical personnel (technical assistance).

The disbursement of D-funds is made by the Donor directly to the Project as goods and technical personnel. The disbursement of cash is disbursed through special accounts which are opened with special permission from the Treasury. The special account

may have been included in the agreement signed between the Donor and the Government. The conditions given by Treasury in opening such account are that:-

(a) Project in question is in the Annual Development Plan and is included in the current budget

(b) Payments will follow government Financial Procedures

(c) The Account will be a government account

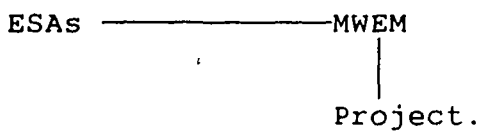
(d) Project Accounts will be kept by Project Coordinator at the Project Office

(e) The Account will be jointly operated by Project Co-ordinator and a government official designated by Accounting Officer

(f) Project Co-ordinator will submit an expenditure return to Accounting Officer at the end of each month (in a format to be agreed by the Donor and Treasury).

(g) The Project Accounts and Annual Statements will be audited by the Controller and Auditor General.

At the end of the year the goods and services (goods, special account and technical assistance) must be accounted for by Accounting Officer requesting for funds through TAN 358 with a cheque payable to Principal Secretary to Treasury and obtaining exchequer issue D-Funds flows to the Project from ESAs as follows:-



FUNDS TO PROJECT BY NGOs

Non-Government Organisation (NGOs) are private or voluntary organisations which carry out social welfare programmes financed by themselves without government contribution or involvement. The programmes are monitored and controlled by the NGOs either themselves or their local or foreign agents. The foreign aid is spent according to their requirements and rules.

Since by nature NGOs want their funds to reach the earmarked target group, their funds to the water sector do not pass through Maji, but their funds are sent straight to the community dealing with the project.

ROLE OF GOVERNMENT (PLANNING COMMISSION AND MINISTRY OF

FINANCE)

When scrutinizing the foreign-funded projects, the Planning Commission must confirm with the Treasury (External Finance) that valid agreements with respective donors are in force or that there is a firm commitment that they will be signed in time for the expenditures to take place. The Planning Commission must ensure that:-

(a) No major changes have taken place regarding the project compared to the agreement with the donor and that if there are any changes the donor accepts them.

(b) Adequate local contributions are set aside for the project in accordance with the agreements

(c) The mode of payment is correctly recorded and that the name of the donor, the amount of assistance as well as conditions of aid-loan or grant - has been correctly recorded

(d) The full amount of aid has been correctly reflected in the budget documents so that disbursement of funds and accountability can be done accordingly. If the amount of aid has been fully provided with funds in the budget but later requires more funds, supplementary funding must be made when due.

(e) Progress reports, in case of on-going projects, have been presented in time to the government and to the donor for disbursements. It must be ensured that all reimbursement claims for work done have been forwarded to the donor.

2.8.2 Constraints

There are several reasons which lead to non-smooth disbursement of funds to an executing agency. Some of the reasons are common to all modes of disbursement i.e C,R,D. The reasons are:-

(a) Limits of the budgeted funds - because of predetermined ceilings, projects funds shown in the estimate books are sometimes less than what the project would actually require in a given year. This constrains the smooth disbursement of funds since funds of a project are all spent before end of the year, and supplementary funding may not be forthcoming.

(b) Lack of reports hinder the smooth disbursement of funds to project. In case of R-funds, lack of reimbursement claims.

(c) Calendar Year versus Financial Year - Our budgeting system follow financial years while some donors,

their budget system follow calendar years. Disbursement of funds from donors who follow calendar years, is disturbed by the fact that one half of the funds is in one calendar year and another half is in another calendar year

(d) Exchange rate fluctuations - exchange rate fluctuation disturb the smooth disbursement of funds to a project since the amount estimated in the budget books at the beginning of the year may be less than the cumulative disbursement of funds by the donor at the end of the year. The extra funds may need preparation of Supplementary Estimates which may not be forthcoming.

(e) Inefficiency of the local banking system- the funds may be disbursed by donor and released by Treasury to the executing agency e.g. Maji. The system of warrant of funds and sub-warrant of funds takes a long time to reach a project because of the inefficiency of the Banking System. It is reported that because of forgeries of Warrant of Funds, strict measures have been taken by the bank to arrest the situation and this is the cause of such delay of funds.

As for D-funds

(i) Pledges versus Actual disbursements.

Experience shows that there is a wide difference between pledges and actual disbursements. Sometime goods are not delivery within the agreed time. Goods for this financial year may be disbursed next financial year

(ii) Value of Goods and Services

The value of goods and services is sometimes difficult to get especially the value of technical assistance

(iii) Lack of system for information

There is no full proof system for accurate and timely flow of information relating to goods and services received directly by the project from donors, customs department or field officers

(iv) Lack of documents

Details of payments for services and value of goods procured and provided by donors directly to the project are not available because the local project co-ordinators are not involved in

the procurement of goods and services.

(v) Lack of accounting for expenditure

Some institutions under Ministries receive goods and services directly but do not forward documents to the parent ministry to account for the expenditure. The goods are disbursed but since they are not recorded anywhere, it is as though the goods and services were not received.

2.8.3 Recommendations

In order to improve smooth disbursement of funds to Projects, the following are recommended

(a) Funds from ESAs should be reflected fully in the budget documents without subjecting the funds to budget ceilings and if need for supplementary estimates to such projects arise, immediate steps should be taken to prepare the Supplementary Estimates.

(b) There should be regular and timely project reports to enable timely flow of funds from donors.

(c) In case of R-funds, there should be regular reimbursement claims

(d) Budget estimates should be reviewed to take into account exchange rate fluctuations and others so that this is not a bottleneck to smooth disbursement of funds.

(e) The system of Warrant of Funds and sub-warrant of fund which is prone to forgery be replaced by some more efficient system to enable the smooth flow of funds to projects. It is suggested that the proposed establishment of sub-Treasuries in the Regions may eliminate such forgeries of Warrant of Funds.

(f) As for D funds

(i) Donors should ensure that disbursements tally with pledges and that they are made within the same financial year

(ii) The value of goods and services should be clearly indicated and this should include the salaries and allowances of technical experts.

(iii) There should be established a full proof system of accurate and timely flow of information relating to goods and services

received directly from donors.

(vi) Local project coordinators should be involved in the preparation of procurement documents for goods and services.

(v) Institutions under Ministries should facilitate for accounting of expenditure of goods and services by forwarding documents to the parent Ministry.

Since the above recommendations require close working relationship one between the Ministry of Water, Energy and Minerals on one hand and the Planning Commission and the Treasury on the other hand, a system should be established to ensure that each
part plays its appropriate role in order to improve accountability on ESA funds.

2.9 Bilateral consultations

2.9.1 Procedures of bilateral consultations

Most key bilateral donors have institutionalized periodic consultations, normally on yearly basis, where they meet formally with Government representatives to discuss and agree on programmes and magnitudes of assistance for a specified time frame. For a number of donors the mechanism is adhoc. The general procedure for processing project or programmes for funding by bilateral agencies is supposed to follow the following steps.

- Guidelines are issued by the Planning Commission stipulating among others priority areas for the coming planning period and expected resource availability.

- Implementing agencies formulate project ideas according to National and sector policy guidelines (Implementing agencies include Ministry, Parastatals Regions, Districts). Formulation of project ideas may involve carrying out of preliminary and detailed studies.

- Project proposals are submitted to/or compiled by relevant line or sector Ministries or Regional authorities. If requests are approved at this stage, ministries prepare project documents and submit them to the Planning Commission. The Regional Authorities submit their proposals to the Ministry responsible for local Government Affairs, or at the moment to the Prime Ministers Office who also submits the requests to the Planning Commission for review and further processing.

- The Planning Commission submits approved requests to the Ministry of Finance for soliciting of external assistance.

- The Ministry of Finance after a number of efforts

arranges consultations meetings to negotiate and agree on funding of programmes. For donor agencies without the practice of holding periodic consultations, agreements are reached through exchange of letters, diplomatic consultations and ad-hoc meeting of relevant officials and authorities.

Implementation Problems

The procedure for submitting and approving requests for external assistance is implied in the act establishing the National Planning Commission. The Government created the National Planning Commission in March 1989, the objective being to improve and systematise the planning system, including the approach for mobilizing and allocating public resources. The institutional set up of the commission is intended to make the planning system more effective in addressing the economic problems of the country. However, even with the elaborate procedure established under an act of parliament the planning and coordination of external assistance has been facing a number of problems.

(i) Most implementing agencies or Ministries are submitting requests to donors without involving the Planning Commission. At times the agencies do make binding commitments without exhaustive review by both the Planning Commission and the Ministry of Finance.

(ii) Some Ministries complain that even where requests are channelled through the Planning Commission, the Commission did not respond in time. Thus the Commission is yet to be effective in guiding the choosing of programmes for external assistance.

(iii) Periodic consultations with donors are not effective occasions for objective review and exchange of ideas and positions. They are basically occasions for blessing positions reached elsewhere.

(iv) Donors are spread thinly to too many projects and the number of donors and local agencies involved in aid management is large. This calls for an effective aid coordination, an aspect which is missing at the moments.

Proposed approach and framework for external sector/assistance planning and management

Given the growing scarcity of domestic and external resources world-wide expanding and competing demands for external resources and the multiplicity of independent agencies in the business of external assistance, the Government in collaboration with the donor community has initiated actions for formulating a foreign aid coordination strategy. Overall international consensus is that, effectiveness of assistance may be enhanced by:

(i) defining more clearly the priority areas to which external assistance as well as domestic resources are to be directed.

(ii) reducing the spread of donor assistance by identifying priority sectors and activities for concentration of assistance for each donor agency.

(iii) the Government is to exercise more ownership of projects and programmes funded by external resources. The Government will do this by strengthening its project identification and selection capability, by improving its negotiation skills and by monitoring more closely the expenditures and implementation of projects.

In order to improve on aid coordination, the Government is putting in place an arrangement to make sure the project approval process follows established procedures. Procedures will be timed to allow for adequate technical evaluations by Government professionals and authorities. In order to institute this arrangement, an appropriate aid management and information system is to be designed and instituted by local implementing agencies in collaboration with the donor community. Starting February 1994, the government, with the assistance from UNDP will implement a specific project on Aid Management, Administration, and Coordination System (AMACS), to improve on aid planning, monitoring, evaluation and reporting.

2.10 CHANNELLING OF FUNDS

2.10.1 Procedures of Channelling of funds to various projects

Government Projects in Tanzania are divided into three groups namely: National, Regional and District Projects. The difference between the three types of projects are as elaborated hereunder:-

i) National Projects - These are projects which are large in size and of national importance. These projects are initiated and executed by Ministries and parastatal organisations.

ii) Regional Projects - These are projects which are generally small in size and geared towards serving the needs of a particular region. Normally these projects are initiated and implemented by regions.

iii) District Projects - Formerly these projects were part of regional programmes but after local government were established in 1986, these projects are treated separately. The projects are very small in size and cater for local needs.

The channelling of Government Funds to various projects follow the grouping listed above. National projects funds are channelled through the Principal Secretary of the Ministry under which these funds are budgeted. The Regional Funds are channelled through the Regional Development Director of the respective vote under which the projects fall. The Principal Secretary and the Regional Development Director are accounting officers and can account for the funds going through them. Local funds for the districts are channelled through the District Executive Director (DED) but funds from ESAs meant for the Districts are channelled through the RDD. This is so because of trying to safeguard ESAs funds from being misused once channelled through DED.

PROCESS OF GETTING FUNDS

When the Parliament has passed the Appropriation Bill into an Appropriation Act, Ministries, Regions and Independent Departments start requesting for funds. The list of projects which are funded are shown under each Ministry in Volume IV of the development Estimates. In this Volume, the details of each project regarding funding from local and ESAs are shown. Also the mode of disbursements of funds from ESAs are, indicated i.e cash Reimbursement or Direct to Project (C, R, and D Funds).

On the basis of what is contained in Volume IV of the Development Estimates, Action Plans are prepared giving details of what is to be done in a year for each project and how much money is required for each quarter. The Action Plans from various projects are routed through their departments to the Ministry Headquarters where they are, consolidated into the Ministerial Action Plan. The Action Plans together with the form TFN 358 (request form) is sent to the Planning Commission for release of funds for the respective quarter. The Planning Commission goes through the Action Plans and the form TFN 358 checking and making sure that all the necessary details have correctly been entered. The requests are then approved and forwarded to the Ministry of Finance.

In the Ministry of Finance, the Budget Division on behalf of Paymaster General issues Exchequer Issue Notification using form TFN 766 to the Accounting Officer, Ministry of Water, Energy and Minerals with a copy to Bank of Tanzania Authorising them to spend money up to the specified amount for purposes shown in the approved estimates and in accordance with financial laws and regulations.

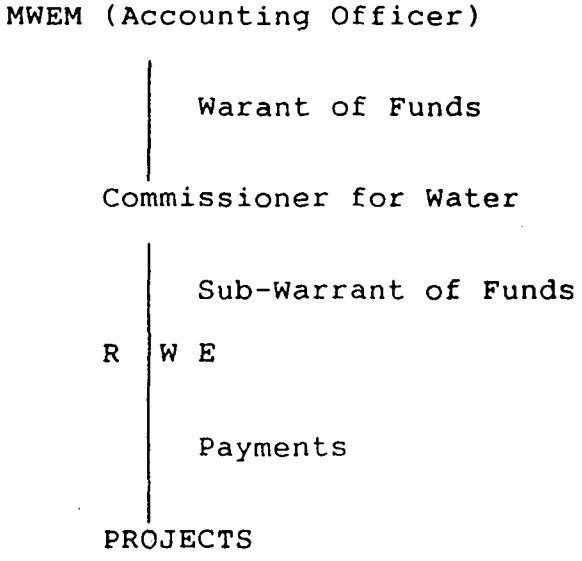
CHANNELLING OF FUNDS FROM THE MINISTRY OF WATER, ENERGY AND MINERALS HEADQUARTERS TO THE PROJECT SITE

The Accounting Officer (Principal Secretary) upon receipt of exchequer Issue notification from the Paymaster General (Principal Secretary - Treasury) proceeds to allocate funds to his departmental heads by issuing Warrant of Funds Using Form TFN 143 specifying the amount to be spent on various services. The head of Division/Department may sub-warrant the funds to

sections and units depending on the size and nature of the operation of the divisions. Under the unit, there may be one or several projects being implemented.

Expenditure on a project begins with a commitment after the Warrant of funds or sub-warrant of funds has been received by the head of unit/project. Execution of project should be according to financial laws and regulations.

FLOW OF FUNDS FROM MWEM TO PROJECT SITES



Information of funds allocated to the Project

The amount of Government funds allocated to a project both local and foreign are shown in Volume IV of the development estimates. Since there are only a few copies distributed to the Ministry Headquarters, most of the officers who are directly dealing with the Project may not know the Project's budget. The Principal Secretary in the Ministry should communicate with all the Project Managers (Resident Engineers) informing them the amount of funds allocated to each project. This will enable the Project Manager to programme the activities of the projects under his control. In cases where some of the funds remain at the Ministry Headquarters for other supporting services, this should be indicated to the project manager.

Special mention should be made on one project under the Ministry of Water, Energy and Minerals which is Studies and Design Project. This project as the name suggests lists various towns which the Ministry intends to conduct studies and designs in a given year. Since the towns to be studied are in Districts, the Ministry of Water uses the respective RWEs and DWEs (Planning and Design Section) to conduct the studies on behalf of the Ministry of Water, Energy and Minerals. This is one case where the RWE and DWE who are implementing the project have no prior knowledge of the

project. They come to know the Project funds are available after the Commissioner for Water writes them a letter requesting them to bring action plans for the studies of the given towns. After the actions plans from the respective DWEs/RWEs have been submitted to the Commissioner for Water, the Commissioner sub-Warrants funds to them.

Information on expenditure at MWEM

At the Ministry Headquarters each project is required to have a record of all the expenditures from the beginning of the project to the current time. The expenditures could be broken down into local and foreign funds to be able to know how much money from each source has gone into the project. This data would be up-dated annually. This data is not available at the moment. It is recommended that an inventory of expenditures for all projects be established immediately and updated every quarter/year. This inventory be made available to RWE/DWE/Project Managers for expenditure planning and control purposes.

Information on expenditures and actual implementation of projects

The Ministry of Water, Energy and Minerals implements many projects scattered all over the country. The project managers/Resident Engineers send quarterly progress reports to the Ministry on the physical and financial implementation of these projects. Experience shows that many of the reports are not regular and their accuracy is questionable. Sometimes physical implementations of projects do not tally with expenditures made as per action plan. To curb false reporting it is recommended that those reporting on the progress of the project should make a declaration at the end of the report that progress reports they send to the ministry are correct according to their knowledge. If the report is later found to be false, the Accounting officer should take disciplinary action against the officer concerned. In addition, there should be regular project inspection by officers from MWEM headquarters to make on the spot assessment of project implementation.

Problems in the channelling of funds from the Planning Commission/Treasury to Project sites

There are delays in the flow of funds at various stages from the Planning Commission/Ministry of finance until the funds reach the Project Sites. The courses of these delays at the various stages are given below:-

Channelling of funds from Planning Commission/Treasury to MWEM

The causes of delay of release of funds from the Planning Commission/Ministry of Finance is made by one or more of the following:-

(a) Late approval of budget by Parliament makes it

difficult for MWEM to secure funds early in July. Approval by Parliament is made late in August. Late release of funds in the first quarter affects the other quarters.

(b) Action Plans and Progress reports: Late Submission of Action Plans and Progress Reports from the Ministry of Water leads to late securing of funds from the Ministry of Finance.

(c) Bureaucracy at Planning Commission/Ministry of Finance: To some extent the number of people involved in processing the release of funds at Planning Commission/Ministry of Finance causes delays of release of funds from the Ministry of Finance to the MWEM.

Channelling of Funds from MWEM to Project Sites

The Accounting Officer in MWEM once he receives funds from the Ministry of Finance, he allocates it to the various Departments through Warrant of funds which involve the banking system. There are delays in the processing of the Warrant of funds from Dar es Salaam to the up-country stations by heads of departments which in turn means projects getting funds late. There are also delays involving the bank in clearing the warrant of funds in the up-country stations. The bank has become more strict in handling the warrant of funds after forgeries of warrant of funds became common. This has caused extra delays in funds reaching the projects.

2.10.2 RECOMMENDATIONS

In order to facilitate smooth channelling of funds from the Planning Commission/Ministry of Finance, the following steps are recommended:-

(a) The Presidential withdrawal warrant which is signed by the President to authorise the withdrawal of money from the Exchequer Account to be used in meeting expenses before Parliamentary Approval be done early in July to reduce delays.

(b) The Action Plans and Progress Reports be prepared and submitted to the Planning commission/Ministry of Finance late in June so that funds are released without delay early in July. All officers responsible for the Action Plans and Progress Reports at all stages should be made accountable for causing delays in the release of funds.

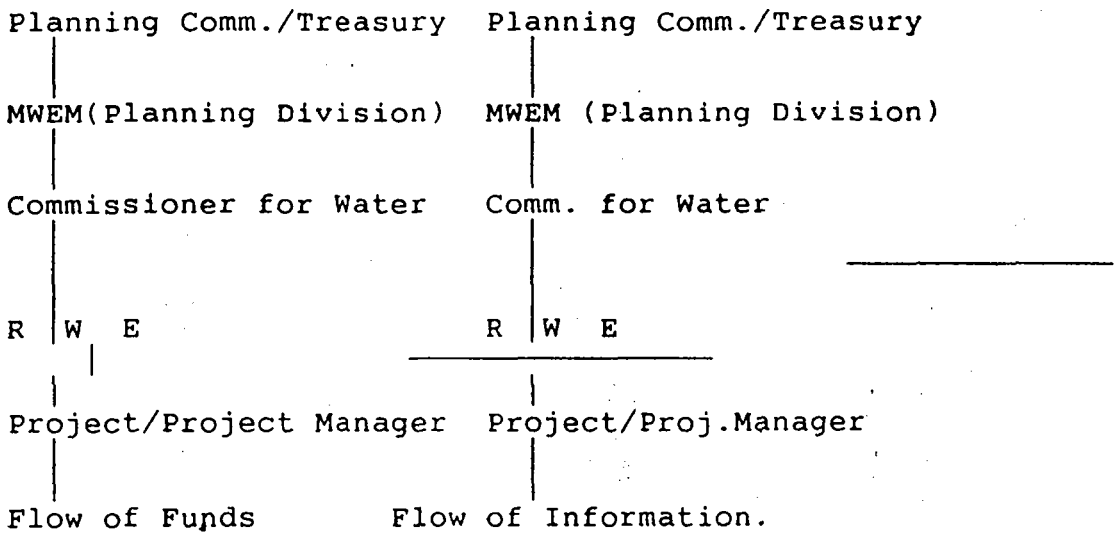
(c) Officers dealing with release of funds in the Planning Commission/Ministry of Finance should always strive to process the release of funds early to enable implement project according to schedule.

(d) The Accounting Officer of MWEM should deal with the delay of funds within his organisation. The heads of departments with MWEM should be given instruction to speed up the processing of warrant of funds/sub-warrant of funds to projects in the up-country stations.

(e) Delays of funds related to Banking are expected to end with the introduction of Sub-Treasury System which, will almost wipe out forgeries of Warrant of funds.

(f) Information flow

The flow of funds from Planning Commission/Ministry of Finance to the Project and the flow of information from the Project to the Planning Commission/Ministry of Finance should follow the same channel.



For National Projects, the Project Manager will write physical and financial progress reports of the project for each quarter. The reports from various projects in the Region will be consolidated by the Regional Water Engineer and sent to the Commissioner for Water. The various sections under the Commissioner will go through the reports and vet the reports before they are forwarded to the Planning Division. The

reports from the various Departments/Divisions will be consolidated into a Ministerial Report before being submitted to the Planning Commission/Ministry of Finance. The reports at each level are required to be signed by head of the relevant section for accountability purposes. The emphasis should be on timely flow of accurate information at all levels particularly with regard to action plans and physical and financial progress reports.

For National Projects, the Project Manager will write reports on expenditure and physical implementation of the project for each quarter. The reports from various projects in the Region will be consolidated by the Regional Water Engineer and sent to the Commissioner for Water. The various sections under the commissioner will go through the reports and vet the reports before they are forwarded to the Planning Division. The reports from the various departments/Divisions will be consolidated into a Ministerial/Report before being submitted to the Planning Commission/Ministry of Finance. The reports at each level are required to be signed by head of the relevant section for accountability purposes.

3. MANAGEMENT OF URBAN WATER SUPPLIES

3.1 Uncertainty of the future management of urban water supplies

3.1.1 Assessment of the current situation of NUWA

(a) Introduction

The National Urban Water Authority (NUWA) was established by act of parliament in 1981 with the main objective of management and supervision of the waterworks and water supply in all urban areas. To-date the only specified town under management of NUWA is the city of Dar es Salaam.

The gazetted area under management of NUWA was increased in July 1992 to include the satellite towns of Bagamoyo, Kibaha and a two kilometer corridor on either side of the transmission mains from both Lower and Upper Ruvu plants.

(b) Administration

Based on the Act, NUWA has since its inception maintained two levels of management (i.e. National and Dar es Salaam Water Supply) although administering only one water authority. The management structure was slightly modified in 1991 (within the act) to address more effectively the Dar es Salaam water supply branch.

(c) The Water Supply System

The Dar es Salaam water supply system is characterised by general shortage and uneven distribution.

The latest rehabilitation of the system was made to the Upper Ruvu water works in 1990. Both the Lower Ruvu and Mtoni treatment plants have outlived their design periods and are in dire need of rehabilitation and expansion to at least reach their respective design capacities.

The current demand of water to the city is estimated at around 355 000 m^3/day, while the total production capacity of the plants is about 270 000m^3/day. The unaccounted for water in the system was rated at around 35-50% of the production by the JICA study of 1990.
The distribution system is both old (more than 30 years old) and inadequate. Most of the areas developed after the 70's do not have planned distribution network.

The investment costs required to undertake rehabilitation expansion of the system to effectively meet the demand up to year 2000 is estimated to be Tshs. 81 billion (Urban Sector Studies 1992). NUWA has recently invited consultancy services to undertake a detailed study and design of both the water works (Lower Ruvu and Mtoni) and the distribution system under AFDB financing.

(d) Operation and Maintenance

The operation and maintenance costs evaluated by the Urban Sector Engineering Project in 1992, indicate that the Dar es Salaam Water Authority would not break even, unless tariffs were revised by more than 30%. This revision of tariff would not however be sufficient to finance investment required, but just meet the operation and maintenance cost.

As an example tariffs were revised by between 20-25% effective September 1993, contrary to a 100% revision proposed by NUWA. This is inadequate and improper to say the least. It can be said that it is difficult for NUWA to break even under the current tariff rates due to the following reasons:-

- **High operating costs** especially those of electricity and chemical inputs which are pegged on convertible currency resulting from floating of the shilling against major currencies.

- **Inefficient collection** of revenue experienced by NUWA for various reasons. A review of previous budgets of NUWA indicates that their revenue collection is around 60% of the projected budget. A rather low figure considering that the tariffs are very low indeed.

- **Unrealistic tariff rates as a result of Government's** reluctance in approving rates which cover the cost of producing water. Tariffs are reviewed once in many years and even when this is done it does not reflect the real cost of producing water. It seems tariffs are political considerations rather than anything else.

- **Inadequate billing** mechanism. The billing system does not adequately cover every customer and is not effectively responsive to customer requirements.

3.1.2 Review of the related urban water studies

A number of studies were recently carried out in both Dar es Salaam and other urban center water supplies. The findings and recommendations of four of the most recent studies are highlighted below:-

(a) JICA report 1991 - study on rehabilitation of Dar es Salaam water supply

The objectives of the study were as follows:-

. To prepare improvement plan for strengthening of NUWA for sustainable development

. To identify scope and size of rehabilitation of the existing water supply system

. To prepare preliminary design of immediate rehabilitation

The main findings of the study are listed below:-

. The water supply is inadequate in both quantity produced and coverage of distribution network. The system experiences heavy losses of up to 20% along the transmission mains and 35% as leakages in the distribution system.

. There is a high number of illegal connections assessed to be of same order of magnitude as the legal connections. About 15% of the legal connections are not billed due to the inefficient billing system. Actual revenue collected is only 70% of the theoretical revenue due.

. There is no clear demarcation of boundaries of jurisdiction between Dar es Salaam NUWA branch, NUWA headquarters and the ministry of water.

. A tariff increase of 32% per annum was necessary from 1991 for NUWA to operate at break even point.

The study came up with the following recommendations:

- Although the water supply system is in very poor state and in need of rehabilitation, it is necessary that financial and organisational improvements be undertaken before technical improvement. Emphasis should be on improvement of the existing system rather than on expansion;

- NUWA should demarcate boundaries of jurisdiction between Dar es Salaam branch, Regional and District water engineers representing ministry in Dar es Salaam, and NUWA headquarters;

- Efforts should be made to cooperate between the city council and the water authority, through establishment of branch advising committees.

- An annual revenue increase is necessary for NUWA to break even.

(b) NUWA report on Tariff and Revenue Collection 1991

The NUWA report on Tariff and Revenue Collection had the following objectives:-

- To help the ministry of water and NUWA to asses need of tariff raises;

- To locate weak areas in billing and revenue collection of NUWA;

After a thorough study the following findings came out:-

. The current method of estimating tariff, through flat rates, underrates water consumption especially that of

high consumers;

- A lot of revenue is being lost through improper billing;
- Late decision making on new connections leading to loss of potential customers;
- Due to the above factors there is poor debt recovery;
- Monthly billing cost is high compared to bill rates. For example it costs 86/= to bill one customer for a monthly bill of 200/=.

Based on the above findings the study made the following recommendations:-

- There should be staged tariff revisions rather than large revisions over long periods;
- The present monthly billing system should be changed to bi-monthly or quarterly;
- NUWA should abolish the flat rate system especially for large consumers;

(c) Urban Sector Engineering Study: Infrastructure Rehabilitation 1992

The Study had the following objectives:

- To restore existing infrastructure installed to capacity
- To institute operation and maintenance programme to prevent deterioration of infrastructure
- To carry out selective expansion/modification of the facilities for better performance.

This study was carried out under the ministry responsible for urban councils and local government, and covered infrastructure services in the 8 municipalities and the city of Dar es Salaam

The Study came up with the following findings:-

- The extent of investment required to rehabilitate the water supply services far exceeds the financial ability of the municipal councils
- Many decisions of political nature need to be taken before financial basis can be established
- There is a general lack of institutional focus in management of operation and maintenance of the water supply services leading to inconsistent operation and maintenance or complete lack thereof

The Study made the following recommendations:

. There is need of institutional reform irrespective of location (i.e. under MWEM, Local Govt, Municipal Council etc.)

  The institutional reforms required may include:-

  - Commitment by the Government at the centre,
  - Removal of duplication of efforts,
  - Improved management and
  - Clear distribution of responsibility and authority.

. There is need of adjustment of revenue to meet the O & M and a pronounced need to maximize utilization of the already installed water supply systems.

. Current tariffs could meet O & M cost of even a town with full mechanical treatment and pumping. However, if depreciation is to be added i.e. full cost recovery, then tariffs have to be doubled. The current tariffs do not however, meet the O & M cost due to:-

  - Inefficiency in collection and
  - Improper collection (while industries contribute 80-90% of the collected revenue they consume only 35% of the water supplied. Domestic consumption contributes 5-10% of current collected revenue while consuming 65% of the water supplied)

. The strategy by MWEM to institute independent autonomous bodies for management of individual urban water supply was seen as being an appropriate approach.

. Privatization of sell of water should be looked into as a solution to maximize revenue collection

(d) MWEM report on Financing of O & M Cost of Urban Water Supplies and Sewerage, 1993

The MWEM study had one objective:-

Appraise the existing situation of urban water supplies in relation to management, organisational set-up, operation and maintenance and finances.

The study came up with the following findings:-

- Financing of O & M of urban water supplies has been dwindling with time;

- The revenue collected is not ploughed back into O & M of the water supplies;

- It is possible to run urban water supply on commercial basis however, investments are required to produce sufficient water to meet the demand;

- There is deficiency billing of water and recovery of bills is only about 62% of the due revenues.

Based on the above mentioned findings the Study made the following recommendations:

- Tariffs should not be pan territorial but be allowed to vary from one water supply system to another or from one region to another depending on the actual cost of production.

- Revolving fund should be set up as an immediate solution to improve management of O & M of urban water supplies;

- Autonomous bodies for the management of urban water supply and sewerage should be instituted in individual towns.

3.1.3 Recommendations

Having reviewed the four studies the following recommendations are made.

1. The current organisation of NUWA should be revised in view of the Governments intention to start independent autonomous water authorities for the other towns.

2. There is need of revising the current tariff system to ensure that the urban water supply systems can at least break even.

3. Privatisation option for urban water supplies should be looked into, with the intention to primarily improve revenue collection. Water could be sold in bulk to private people, who should manage the sales to individuals.

4. Tariffs must be flexible in terms of amount and mode of payment. The rates must also be reviewed from time to time to reflect the real value of the Tanzanian shilling and cost of producing the water.

5. Flat rates should be abandoned especially for the large consumers who must be metered.

3.2 The role of the ministry in view of abolition of SCOPO

Text is under preparation

3.2.1 Relationship between urban water utilities and the Ministry.

3.2.2 Examine water quality monitoring and surveillance system for domestic water supply

3.2.3 Recommendations

3.3 Water supply and sanitation joint billing

3.3.1 Review of existing studies on joint billing

Studies on joint billing have only been conducted in Dar es Salaam. However, we shall draw from the most recent study done for Da es Salaam, which was carried out by Price Water House in 1987. The study involved survey of all properties in sewered areas to identify properties connected to the public sewer and updating of those with water connections from NUWA. The property survey left many loose ends to be followed up by the respective agencies after installation of the system. To tie up these loose ends the following has to be done:-

(i) Revisiting of some properties whose residents were not available during the survey.

(ii) Updating of property list which were at the survey time under construction.

(iii) Checking customer postal addresses and plot numbers to confirm with the NUWA account numbers for proper billing.

The installation of the joint billing and follow-up on loose ends left by the study did not take place until July, 1993. Among the reasons for the delay were:-

(i) The two services are under two separate authorities, while water supply is under NUWA a public corporation under Ministry of Water; sewerage services are under DSSD (Dar es Salaam Sewerage and Sanitation Department), a semi autonomous institution under the city council.

(ii) Financing of the programme to facilitate joint billing which was under World Bank financing stopped. Installation of computers for this purpose was not completed until 1992.

(iii) NUWA was just starting its own computer billing system so the idea of joint billing could not be accommodated outright.

(iv) There is not any institutional arrangements for joint billing. All what is done is only out of good will of the office bearers of the respective institutions.

Results of Joint Billing

Due to lack of follow-up to refine the surveyed data and the long duration it took to install joint billing, the property/customer survey was of much lesser use than previously anticipated.

According to interviews with DSSD, a slightly different procedure has been adopted to try and meet all customers within serviced area.

(i) All water customers within a serviced area are assumed to be connected to the sewerage system and billed

(ii) Complaints from customers who are not connected to the sewerage system required verification by DSSD, which automatically updated their records.

A separate survey is currently being undertaken by DSSD to update the previous study data.

3.3.2 Relevance to other urban areas

Tariffs on sewerage are currently being charged in Dar es Salaam where it only started recently. Other urban areas have comparatively smaller sewer areas and customers compared to Dar es Salaam. Introduction of joint billing in other urban areas will arrest the situation at an early stage. **Studies are already underway to institute joint billing in Moshi, Arusha and Tanga municipalities.** Joint billing could be extended to pit emptying services. Extension of joint billing to pit emptying services may be very useful in areas with high ground water table or difficult soil conditions enduring sufficient percolation of water. Joint billing for pit emptying services requires availability of adequate and efficient pit emptying services by the responsible agency including a detailed emptying schedule for particular localities.

The advantage of this kind of arrangement is emptying costs which can be spread monthly over the period in which emptying is required in a particular locality.

The recent study on financing and maintenance costs of urban water supply and sewerage conducted by MWEM in 1993, proposed the establishment of a revolving fund and formulation of new management for urban water supplies and sewerage systems to be headed by urban water supply and sewerage engineer. This system which starts in the three towns of Arusha, Moshi and Tanga is expected to be extended to other towns. The number of towns however, with sewerage systems is small, suggesting the need to asses joint billing in cesspit emptying for problematic towns.

3.3.3 Recommendations

1. Joint billing is a relevant system of billing for sanitation. Customers connected to public sewerage systems can appropriately be billed through this system to avoid additional cost. The system however calls for management of water supply and sewerage systems by one agency to enhance efficiency.

2. Options to extend joint billing to cover cesspit emptying should be studied especially for towns with extensive on-site sanitation rather than sewerage systems as a means of increasing efficiency of cesspit emptying and safeguarding the environment.

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4. WATER RESOURCES MANAGEMENT

4.2 Legislation

4.2.1 Review of Relevant Legislation

Currently there are three pieces of legislation pertaining to water industry administration in the country namely (i) Water utilization (control and Regulation) Act No.42 of 1974 as amended by (ii) Act.No. 10 of 1981 and (iii) written Laws (Miscellaneous) Amendments) Act No.17 of 1989. The thrust of the Act.No.42 of 1974, relates to the administration of grant of rights to the use of water. The object of the amendment of Act 10 of 1981 was to provide for control of water pollution and standard in respect of effluent and receiving water which shall be complied by user of water before or during discharge into water course or receiving waters. The amendment of Act 17/89 was directed towards the enhancement of the penalties which were seen to be light to meet the desired goal of deterring the polluters. To facilitate the administration of the three legislation, three important organs are provided in the Acts namely Central Water Board, Basin Water Board and Principal Water Officer. It remains to be seen whether the arrangement of these organs in the Act do facilitate smooth running of the three pieces of legislation as envisaged by the Parliament.

(a) Relationship and interaction of the three organs i.e Central Water Board, Principal Water officer and Basin Water Boards.

Central Water Board is established under section 5 (i) of the Water Utilization (control and Regulation) Act No.42 of 1974 as amended by Act 10 of 1981. It consists of a chairman who is appointed by the President and not less than 10 no more than 15 members who shall be appointed by the Minister. The function of the body is to act as a principal advisory organ in matters pertaining to the utilisation of water. Basin Water Boards are established under section 7 (1) & (2) of Act No.10 of 1981. The Minister is empowered to designate any area of land to be water basin in relation to any river.

The function of the Basin Water Board are the same like Central Water Board save that they confine to their area of jurisdiction. It consists of a Chairman who is appointed by the Minister responsible for Water Affairs. There have been some discussions at various forums in respect of relationship between Central Water Board and Basin Water Boards. Are the Basin Water Boards answerable to the Central Water Boards? If yes, why are the both members of the two Boards appointed by the same authority i.e Minister. The Act is silent on this aspect. It is important that clarification/amendment is made in view of the fact that in terms of section 7 (1) of Act No.10 of 1981 the Minister has already gazetted 9 (nine) basins of which two are operational i.e (i) Ruvu/Wami Basin, (ii) Pangani Basin Water Board (iii) Rufiji Basin Board (iv) Ruvuma/Lukuledi/Mbwemkuru Basin (v) Lake Nyasa Basin (vi) Lake

Rukwa Basin (vii) Lake Natron/Manyara/Eyasi Basin (viii) Lake Victoria Basin (ix) Lake Tanganyika Basin.

The operational ones are Pangani Basin Water Board stationed at Hale and Rufiji Basin Water Board stationed at Iringa. It is observed that the message should come out clearly from the Act in connection with the co-ordination of the activities of the water basin board and the question of accountability vis a vis the Central Water Board. Furthermore it is observed that Lake Nyasa Basin, Lake Victoria Basin and Lake Tanganyika Basin are international drainage basins which of necessity would require consultation with other co-riparian states to avoid unilateral acts which may adversely effect the legal rights of co-riparian states. However in terms of Helsinki Rules of 1966 each basin state is entitled within its territory to a reasonable and equitable share in the beneficial use of the water of international drainage basin.

Another observation is the powers of the Principal Water Officer vis a vis that of the Central Water Board. Section 6 (1)provide that the Central Water Board shall advise the Principal Water Officer on all matters pertaining to the utilization of water, however section 6 (2) states that the Principal Water Officer shall **not be bound** to follow such advice It is observed that the above section is not consistent with the spirit of the Act when we take into consideration that Central Water Board members shall be appointed by the Minister from persons holding qualifications in scientific field of learning. At any event, their advice should binding on the Principal Water Officer.

(b) Water right application fees

Water right application fees of T.shs.50 - T.shs.100 are too low and uneconomical.However in terms of Section 38 (2) of the Act the Minister is empowered to make regulations in a bid to carry out the intent and purposes of the Act. In terms of Section 38 (2) (b) which reads ''provide for the forms to be used and the fees to be paid in respect of any matter required or permitted to be done under this Act,'' The Minister for water affairs can raise the application fees by publishing notice in the gazette.

(c) Renewal of Water Rights Certificates

Currently the grant of water rights is absolute, there is no time limit or duration. It is recommended that water rights certificates should have a span of say 5, 10, 15, 20 years before renewal depending whether the user is big of small consumer.

Section 15 of Act 42/74 stipulate, "A water officer may grant to any person the right to abstract and use water from such source in such quantity, **for such period,** whether definite or indefinite..... subject to such terms and conditions as he may deem fit". The Principal water officer is at liberty to grant water right for use of water for a specific duration.

(d) Economic user fee

The three pieces of legislation are totally silent on the important question of economic user fee, and hence it is a new element in the Act which will necessitate its own procedure. It is important to point out that something new which is not covered under the Principal Act cannot be introduced in the Regulations. The proposal of economic user fee hinges on policy, and therefore the fall back position should be the water policy. If the economic user fee is reflected in the water policy then the proposed amendments on the user fee should be forwarded to the Chief Parliamentary Draftsman of the Attorney General's office for drafting. As usual the forwarding letter will highlight areas earmarked for amendment. If economic user fee is not reflected on the water policy then a cabinet paper has to be tabled.

(e) Penalties

Although the Act was amended in 1989 in connection with the penalties, experience has shown that the penalties should be further enhanced to deter polluters. Several companies in Tanga Region were taken to court for polluting. They were convicted and ordered to pay fines ranging from 20,000/= - 40,000/=.

It is recommended that apart from enhancing the penalties, awareness of water users and polluters should be sustained by using mass media. Amendments on penalties can be effected by proposing the same to chief Parliamentary Draftsman of Attorney General Chambers.

(f) Revolving Fund

In order for the Water Basin Office to be self-supporting and financially sound the economic water use fee which would be introduced should be retained by the Boards. Normally such funds can be introduced under Exchequer and Audit Ordinance (Amendment) Act No.33 of 1969 Section 9. Treasury should grant consent before the same could take off.

It is important to point out that the Agreement between the Government of the Republic of Tanzania and the Government of the Kingdom of Norway regarding the financial support to the Pangani Falls Redevelopment Project, it is expected that Pangani Basin Water Board should be self - supporting financially by the year 2000. (six years to come). Hence economic user fee should be introduced immediately to make the Boards self supporting and financially sound.

(g) Pollution

Water Utilization (control and Regulation) Amendment Act.No.10 of 1981 deals with water pollution and also provides a penalty for the same. It is high time a comprehensive environmental law is enacted which will encompass all facts of life i.e water, air, catchment areas etc, rather than having an agency

like National Environment Management Council with advisory powers. Multi-sectoral approach will assist to arrest the trend rather than the present fragmented approach to pollution.

4.2.2 Proposed amendments and appropriate arrangement for implementation

As pointed out in 4.2 1 (a) the relationship between Basin Water Boards and the Central Water Board ought to be clarified by an amendment in the Principal Act No.42 of 1974.

The powers of the Principal Water Officer should be pruned to the extent that he should be bound to follow the advice of the Central Water Board. As usual the procedure of amendment is to route the same through the office of chief Parliamentary Draftsman.

In 4.2.1 (b) it was observed water rights application fees are too low and uneconomical hence should be revised upwards. In terms of Section 38 (2) of the Water Utilization (Control and Regulation) Act No.42 the Minister is empowered to make regulations in a bid to carry out the intent and purposes of the Act. The Minister for Water Affairs can raise the application fees by publishing notice in the Gazette to that effect. Principal Water Officer is well versed with the procedure.

4.2.1 (c) speaks of grant of water rights, which appears to be absolute, there is no time unit or duration. However a close reading of section 15 of Water Utilization (control and Regulation) Act No.42 of 1974 shows that a water officer is empowered to recommend on the water certificates time limit or duration - say a span of 5, 10, 15, 20 years as he may deem fit. The arrangement to effect the above recommendation lies with the office of the Principal Water Officer in consultation with the Minister. It is not necessary to publish notice in the Gazette.

In 4.2.1 (d) a new element by the term of economic user fee appears and this will necessitate its own procedure. The three pieces of legislation are silent on the aspect of economic user fee. The proposal of economic user fee hinges on policy, and that being the case the fall back position should the water policy. If the economic user fee is reflected in the water policy then the proposed amendments on the fee have to be forwarded to the chief Parliamentary Draftsman for drafting. However if economic user fee is not reflected in the water policy then a cabinet paper has to be to tabled for approval of the same.

In 4.2.1 (e) the current sentiment is that the penalties are inadequate to deter polluters and potential polluters, and hence the penalties would be enhanced. Amendments on penalties can be effected by proposing the same of Chief Parliamentary Draftsmen - as we did in the written laws (Miscellaneous) Amendments Act No 17 of 1989.

In 4.2.1 (f) it was observed that in order for the Water Basin Offices to be self-supporting and financially sound the economic user fee which will be introduced should be retained by the Boards. Revolving fund are introduced under Exchequer and Audit ordinance of 1961 and Treasury should grant consent before the same could take off. Since we were involved in the arrangement of Revolving Funds for Arusha, Tanga and Moshi Water Urban supplies, we are well placed to do the same for Basin Water Boards

In 4.2.1. (h) the question of pollution calls for multi-disciplinary approach. It is true that water Utilization Act No.10 of 1981 provides for water pollution control and penalties, however it is high time a comprehensive environmental law is enacted which will encompass all facets of life i.e. water, air, catchment areas etc rather than having fragmented approach of each sector dealing on its own. The arrangement for implementation will entail meeting of key players National Environmental management council, Ministry of Natural Resources, Tourism and Environment, Ministry of Water Energy and Minerals Ministry of Agriculture and Livestock Ministry of Trade and Industries etc to chart out the strategy for realisation of the above proposal. Other jurisdiction like Zambia have a very comprehensive legislation on environment.

4.3 Utilisation

4.3.1 Utilisation of traditional furrows

Furrows are simply dug earth canals used as a means of conveying water for various purposes such as irrigation and water supply. Some furrows are lined with concrete. Furrows are commonly of a width of 300-600 mm and a depth of 300 mm.

Intake structures for traditional furrows are usually simple weirs made of locally available materials such as stones, logs or timber. As the structures are not adequately designed they sometimes fail to supply sufficient water to the fields. It is also true that, in some cases, more water is abstracted than is required. Usually there are no flow control devices at the intakes.

In Tanzania, traditional furrows have been developed by the local people over the years. They are intensively used in the highland areas where many perennial small streams originate. Traditional furrows tap water from streams at the higher points in the mountain slopes and then run down the mountain slopes delivering water for irrigation and domestic purposes to the local community. Some of the furrows convey water to the low plains below the mountain slopes. These include highland areas around Kilimanjaro, Meru, Pare, Usambara, Uporoto and the Livingstone Mountains.

Although it is understood that traditional furrows are in use in many highland areas, the extent of use in may of these areas is not documented except in Kilimanjaro, Arusha and Tanga Regions. This is the result of the Water Master Plan

study for Kilimanjaro Region carried out in 1976 and the recent water resources survey activities of the just established Pangani Basin Water Office at Hale. Due to this fact, the discussion regarding the utilisation of traditional furrows is limited to the areas just mentioned above.

Kilimanjaro, Arusha and Tanga are among the regions where the use of traditional furrows is famous. According to the Water Master Plan study for Kilimanjaro region carried out in 1976 the total length of traditional furrows on the mountain slopes of Kilimanjaro was 920 km. and 780 km. in Pare mountains. The average length of the furrows is about 4 kilometers long and the longest can extend 10 kilometers. These furrows have been developed by the local people over the years. More than 50% of the existing furrows in Kilimanjaro region for example are more than 100 years old.

The majority of the furrows around Kilimanjaro mountain about 70% of the total are distributed on the mountain slopes around 1000 meters above sea level. The most prevailing traditional furrows are found at the catchments on the southern slope of Mt. Kilimanjaro. Apart from the furrows located on the mountain slopes, some traditional furrows, about 30% of the total furrows are located on the lower slopes and alluvial plain below the mountain.
Just as in the case of the area around mountain Kilimanjaro , about 70% of the furrows around the Pare mountains is located on the mountain slopes and the other 30% of them are used on the lower slopes or alluvial plain in the bottom of the valley.

In Arusha region the furrows are distributed on the lower slopes of Mt. Meru while in Tanga region the furrows are also distributed on the lower slopes of the Usambara mountains.

The rate of water consumption by traditional furrows out of total surface water consumption for irrigation is remarkably high.

According to the progress report on the activities of the Pangani Basin Water Office of Jan-June, 1993 water abstractions by furrows in Kilimanjaro, Tanga and Arusha is about 32.5, 2.6 and 2.3 m^3/sec respectively. The combined total from the region is 37.3m^3/sec while the net water abstraction in the basin is 48.8m^3/sec. This information shows clearly the extent on which traditional furrows are used for water abstractions in this particular area. An example of the intensive use of traditional furrows to abstract surface water from Weruweru river one of the important streams in Kilimanjaro region is shown in Figure 4.1. Water abstracted from this stream is mainly used to irrigate coffee estates in Hai district in Kilimanjaro region.

4.3.2 Proposal for registration

Most of the traditional furrows are maintained by the customary water right controlled by the villagers, however

when the water right is legally authorized to a certain village, the water right is to be held by the District Development Director. Regarding the allocation of water among members of the community, usually the village leadership is responsible.

In order to improve water use efficiency, it is proposed that, the Ministry of Water, Energy and Minerals should carry out a survey of water abstractions by traditional furrows over the whole country and at the same time to establish an effective registration system for all water abstractions by traditional furrows.

4.3.3 Water use practices by traditional furrows

The major types of water use through traditional furrows are irrigation of agricultural fields, domestic and agroindustrial water supplies. The major portion of water is consumed for irrigation of coffee and bananas during the months from December to March on the mountain slopes. From April to June rainfall is sufficient for these crops and thus irrigation is not required during this period. On the lower slopes water is consumed for irrigation of maize, rice and beans. Rainfall in this area is unreliable in its distribution and amount, so supplementary irrigations during rainy season is required. Traditional furrows are also used to supply water for household needs such as drinking, bathing and washing dishes and clothes where no piped water supplies are available. In addition traditional furrows are used to a limited extent to supply water to agroindustries like coffee pulping and sisal processing.

4.3.4 Deficiencies on the use of traditional furrows:

Traditional furrows have been developed by local farmers and they have been intensively made use of them. The following deficiencies are noted with regard to utilization of water by traditional furrows:-

Conveyance losses by traditional furrows are considerable due to seepage losses in view of the fact that the furrows are earthen canals.

The rather steep gradient of ground surface on the higher part of the mountain slope causes the furrow to run along contour lines to reduce the velocity of water. This result in longer furrows which result in more seepage losses.

Furrow earthen canals on the higher part of the mountain slope are always subjected to erosion along the length and consequently collapsing of walls which cause leakage losses.

A large cross section required for canals on the lower gentle slope and flat alluvial plain to pass on more water since the velocity of water is small because of the gentle slope of ground surface provides conditions which allow water weeks to

grow in the furrow which reduce the efficiency of the canal and causes considerable evapotranspiration losses through these water weeds.

Simply dug out diversion intakes are always subject to erosion and thus are subject to fail to supply sufficient water to fields.

Lack of flow control devices at intakes allow occasional inflow in excess of the demand amount or worse still may allow water to continue flowing through the furrow even when it is not required thereby depriving downstream users of the precious liquid - water.

Water conveyed through traditional furrows for domestic supply is potentially subject to contamination by human activities along the furrow and flooded muddy water.

Investigations carried out in the field indicate that conveyance losses of an earthen canal could be between 10 and 15 per kilometer. Under these circumstances losses between the intake and the point of delivery for an unlined earthen canal can be about 50% over a length of 5 kilometers.

Dual/parallel water mights make if difficult to register, monitor and control usage of water.

4.3.5 Recommendations for efficient use of traditional furrows:

The use of traditional furrows in Tanzania is anticipated to continue for many years to come. In order to achieve efficient utilization of traditional furrows the following recommendations are made:

Provision of intake facilities to control amount of inflow not only to meet the required amount for irrigation but also to save limited water is necessary.

Traditional furrows used for domestic supply have to be changed into improved piped water supply since the method of water supply by traditional furrows is potentially subject to contamination by human activities along the furrow.

Concrete lining of earthen canals is recommended to limit seepage and leakage losses in order to save the limited amount of water.

Long extension of irrigation furrows cause great water losses. In many cases the intakes are located high up in the mountain forests in order to obtain irrigation water without any failure. This kind of conveyance loss can be reduced by construction of an earth dam near to the irrigation farm when a suitable dam site is available.

A count guide survey of all traditional furrows must be made in view of registering and giving water rights.

Control devices must be installed at intakes to ensure abstracting is according to the issued water rights.

Enforcement of the Water Right Act must be taken more serious by the authorities.

Sensitisation of the public users on water right must be done soonest.

There must be concerted and coordinated efforts in water utilization by the Ministry concerned and the users.

4.4 MANAGEMENT

Management of water resources must be done in view of efficient use of the source. Lately, integrated water resources development and management has been given greater emphasis. This has been proven to be essential for sustainable development and management of water resources. It has also been recognized that freshwater is a finite and vulnerable resource.

4.4.1 Existing practice of reservoir operation and maintenance

There are many reservoirs in the country, constructed for different purposes, like water supply, irrigation hydroelectric power generation. Reservoirs operated by MAJI are primarily for water supply purposes. Some of these are Mindu of Morogoro, Sigi of Tanga, Ningwa of Shinyanga, Igombe of Tabora and Bariadi of Shinyanga.

Existing practices of reservoir operation and monitoring involves visual inspection of the dam in order to check for possible cracks in the dam structure or any other physical damages. It also involves recording the water level in the dam through gauges established at strategic points on the reservoir banks. Water level recording is manual in some cases and automatic in others.

Electronic equipment have been established in some reservoirs for purposes of monitoring and sensing the ..... of water. Such a device was installed at Mindu cases and automatic in others.

Discharge into and out of the reservoir is generally not recorded in most of the reservoirs. This is a big anomaly. An example is a weir installed at Sigi dam for this purpose but is reportedly not used as required.

Sediment samples used to be taken at different points of discharge into reservoirs and were analyzed in laboratories. This practice, however, however, has been discontinued in almost all reservoirs for various reasons ranging from lack of

money and transport to unavailability of sediment samplers, sampling bottles and chemicals.

4.4.2 Measures to be taken

The water level in the reservoir has to be recorded continuously. Water level gauges that are damaged or washed away should be replaced immediately. Where possible automatic recording should be instituted.

The amount of discharge into the reservoir should also be recorded continuously. The same should be carried out for the outflow from the reservoir.

Rainfall into the reservoir and the basin and evaporation amount should be recorded. These parameters, along with inflow, outflow and other records should be used to determine the water balance of the reservoir.

Water samples should be taken regularly from the reservoir in order to determine the quality of the water. Also sediment sampling should be carried out regularly in order to determine the rate of silting in the reservoir. nocking on surrounding areas (landuse,

4.4.3 Efficient ways of managing a basin

Introduction

Over the past three to four decades water resources development in Tanzania has expanded rapidly has been on the imperatives of the times. Emphasis has been on exploitation of surface water and groundwater resources for economic and social development, notably for domestic and industrial water supply,irrigation, hydroelectric power generation, and to a small extent,flood damage reduction.Although increasing concern has been shown for environmental and natural system aspects of water management, including problems of water pollution and deterioration of aquatic ecosystems, principal attention has been placed on developing available supplies of surface water and groundwater through construction of surface reservoirs and groundwater pumping plants. Upstream basin management and conservation of already available water resources through demand management were given little emphasis.

Many projects have been planned and designed without adequately considering the complex interrelationship between people, water, land, environment and development. It is therefore important to accommodate water resources development and basin management within the context of environmental, social, economic and cultural preservation and improvement. Management is also important because, in most river basins, there re always two categories with opposing and serving interests. The first is the user group, for domestic, hydroelectric power, industrial, irrigation, transportation, fisheries and other purposes. The second one is that of those fighting against pollution, floods, drought,health,

environment etc. Basin management has to ensure monitoring and co-existence of both groups.

Proposals for efficient management of river basins

1) Availability of hydrometeorological data serves as the first steps towards basin management. Hydrometerological services should be reorganized to operate at basin level rather than the present system of operating within regional boundaries.
2) The examples of establishing the Pangani Basin Water Office and the Great Ruaha Basin Office should be extended to the all river basins in the country. Further all sectors involved in watershed management should be represented in those offices.

3) Basin management is presently being administered separately by government ministries and institution that are not closely coordinated.

It is proposed that integrated management of water, land forests be undertaken. There is need for formulation of an
4) integrated river basin management and conservation programme that will provision of basin resources requirements of the community.

5) Poor farming methods which result into erosion of the land and, hence sedimentation in rivers, reservoirs, dams and lakes should be avoided. The Ministry of Agriculture, through extension officers, should introduce good agricultural methods and particularly less water intensive irrigation practices. The Ministry should educate and/or advise farmers on better animal husbandry in order to avoid overgrazing. Further, the Ministry should ensure that application fertilizers and pesticides is done carefully and at required amounts to avoid groundwater pollution.

Integrated basin land management and water resources development of streams, lakes and groundwater should be
6) undertaken in order to deal effectively with important land-water linkages in river basins, such as erosion, sedimentation, pollution, flooding and water yield.

To achieve this, a study of the existing institutions concerned with basin management, their organisation and existing cooperation between them should be carried out from which recommendations on their cooperation for integrated management should be given.

Mounting human population pressure and the need for increased food and cash crop production calls for more agricultural land. This, coupled with the ever rising need for fuel-wood, brings about indiscriminate clearing of forests, and fires in the catchment areas, which result into soil erosion and destruction and drying of water sources.

7) It is proposed, therefore, that the extent of forest cover on basins be determined and, including an estimation of deforestation and the likely effect on the catchment hydrology

with respect to annual total runoff, seasonal distribution of runoff, floods, siltation of rivers dams and reservoirs, etc.

9/ By-laws should be enacted to safeguard against indiscriminate deforestation and the community should be given the responsibility of guarding forest covers around their localities.

Discharging of untreated effluent from industries and households results into pollution of water sources and the basins as a whole.

The relevant sections of the present Water Law (Control and Regulation) Act, which deal with pollution of water bodies 9/ should be reviewed and , accordingly, revised from time to time to suit the prevailing conditions. The law should be 9/ enforced and the fines for the violators should be heavy enough to detract offenders. Monitoring of the effluent 11/ discharge points from industries should be carried out instantly in order to ensure that they abide by the provisions and requirements of the law.

gender neutral sections on "people".

12/ There is lack of people's awareness and community participation in the observation and protection of water resources. There is a need of launching a radio campaign programme to educate the masses on the importance of water sources and general environmental protection and to urge the community to participate fully in protecting basins and areas in their vicinity.

male/female interest landhose dispute.

13/ A water balance of every major river basin should be made for purposes of issuing proper water rights. On top of this a data bank should be created on the existing major water abstractions from rivers and other sources. This should include data on flow quantities extracted and any return flows as surface or groundwater.

14/ The community should be encouraged, through village leaders, to participate in planting trees around water sources and other areas having little or no vegetative cover. The government, through the ministry of lands, natural resources and tourism, non-governmental organisations and public and private institutions should provide the financial back-up to villagers efforts.

4.4.4 Existing hydrometeorological, hydrogeological and water quality observation network

Existing hydrometeorological observation network

In Tanzania there are a total of 918 hydrometeorological stations operated by Maji, of which 399 are hygrometric, 79 are meteorologic and 440 are rainfall stations. A good number of these stations are not functioning due to lack of rehabilitation or replacement of damaged/worn out instruments.

The table below shows the distribution of hydrometric stations regionwise, in terms of those functioning and not functioning.

NO	REGION	STATIONS (TOTAL)	FUNCTIONING	NOT FUNCTIONING
1.	Arusha	35	32	3
2.	DSM/Coast	26	18	8
3.	Dodoma	139	36	103
4.	Iringa	28	24	4
5.	Kagera	71	35	36
6.	Kigoma	31	22	9
7.	Kilimanjaro	40	34	6
8.	Lindi	17	11	6
9.	Mara	22	13	9
10.	Mbeya	74	67	7
11.	Morogoro	71	50	21
12.	Mtwara	16	6	10
13.	Mwanza	51	34	17
14.	Rukwa	55	40	15
15.	Ruvuma	31	28	3
16.	Shinyanga	80	69	11
17.	Singida	56	18	38
18.	Tabora	39	13	36
19.	Tanga	36	32	4
	TOTAL	918	582	336

Existing hydrogeological observation network

In the whole country there is only one location where regular groundwater level monitoring is presently carried out and that is the Makutupora Basin in Dodoma. Here there are a number of observation wells in which the groundwater level fluctuation is monitored and recorded continuously.

There are a few observation stations at Tanganyika Planting Company (TPC) in Arusha Chini where water quality is also being monitored. In the past years observation wells were filled during preparations of water Master Plans (WMPs) in Dar/Coast; Iringa, Mbeya and Ruvuma; Kigoma and Rukwa and other areas, but their operation was discontinued on

completion of the WMP's. In Dar/Coast piezometer where installed at different locations. Presently, almost all wells are not functioning; they have been damaged over the years and they are not ebbing monitored due to lack of money and transport.

Existing water quality observation network.

Like the hydrogeological observation, the water quality observation network is also very poor. A few water quality observation and monitoring stations are located at:

Sakina in Arusha

Maji ya Chai in Arusha

Mkutupora borehole in Dodoma

Stiegler's Goerge

Mwanza South Port in Mwanza,

Nyakanyasi In Bukoba

Burerebe Island in Bukoba

There is a defluoridation project at Engurdoto in Arusha which is however, very expensive and the technology involved is highly sophisticated.

4.4.5 Adequacy of observation network

A reasonable coverage of hygrometric stations was achieved in the 1970s. Then the network started declining and this, very unfortunately, coincided with a large influx of about 50 hydrologists of Msc standard, most of them still employed in the Water Research Division. The Meteorologic and rainfall stations network has equally declined. The table above shows that only 582 out of 918 stations are in operation, which is only 63% of the total network.

The coverage of the network is therefore quite inadequate. Stations are not uniformly distributed and hence the collected data lacks in homogeneity and consistency. Station coverage is most weak in the southern regions of Lindi and Mtwara. Moreover there are very few automatic recording stations, particularly in remote areas and locations not easily accessible. Through preparations of Water Master Plans it was found out that the densities of networks of hydrometeorological stations and the data obtained from them were satisfactory for project design and planning, but inadequate for project design and implementation. For example, in 1982 rainfall data produced by 40% of the stations were unreliable.

The hydrogeological observation network is almost non-existent in the country, except for the Makutupora basin. Many areas in

the country are going to rely more and more on groundwater due to the increasing problem of drying surface water sources. There is therefore a big need to monitor the behavior of groundwater aquifers in order to determine their capacity. Producing wells should be monitored too. With such a poor network reliable location of wells and boreholes will be difficult.

As shown above the water quality observation network is also very poor. The few observation sites mentioned above are, in fact, part of the GEMS (Global Environmental Monitoring System) programme. Water quality monitoring is only done by taking samples occasionally from water bodies or sources of particular interest at a specific time. Water quality monitoring and analysis have not been regularly undertaken since the water master plan activities.

4.4.6 Proposals on improvement measures

Hydrometeorological network

It has been shown that a large number of hygrometric stations are not functioning. Paucity of funds severely restricts the availability of transport needed to visit the measurement sites, check the equipment installed and control observers. Without these inspections, data become unreliable and effectively useless. It is therefore proposed that each region in the country be provided with at least one four-wheel-drive vehicle specifically assigned to the hydrology section to be used for field visits. Also all current meters should be recalibrates.

The present hydrometeorological network should be reviewed, areas not covered identified and efforts be made by the Water Research Section of the Ministry of Water,Energy and Minerals to establish new stations where they are missing and rehabilitating those that are not in good operating condition.

In order to reduce high maintenance costs, an automatic satellite - based telemetry system should be introduced, in a phased manner. The initial phase would take care of those areas severely and repeatedly hit by floods.

The costs of running and maintenance of the network are so high that the government finds it difficult to take care of them easily. In order to give an indirect support to the government is proposed that a feasible charge be introduced is proposed that a feasible charges be introduced for the supply of water data and services and that the money so accruing be channeled to the running and maintenance of the hydrometeorological network.

Institutions whose services or operations require data that is collected from the hydrometeorological network, e.g. TANESCO, should directly the involved in the running and maintenance of the network.

Hydrogeological network

Because of the problem of drying surface water sources water supply is going to be derived more and more from groundwater aquifers. Hydrogeological observation is therefore more important now than before. It is proposed that producing wells in different locations in the country be monitored continuously. Observation wells should be drilled in all basins particularly in those areas with a high groundwater potential. Groundwater characteristics should be obtained in all such wells. Piezometers should also be installed in river basins in order to monitor groundwater level fluctuations.

Water quality network

Water, being a primary element of the environment, it is highly susceptible to pollution. Water from boreholes is generally of good quality, but the quality of surface water is often poor, especially bacteriologically. The necessity of having a good water quality observation network, therefore, cannot be overemphasized.

It is proposed that water quality observation and monitoring stations be established in all river basins. Also, these stations should be provided in volcanic areas and Rift Valley, where groundwater has high fluoride levels. Defluoridation should be instituted in all water sources whose fluoride content is above acceptable limits.

Furthermore, water samples from the observation stations should be taken regularly to the zonal laboratories, or to the Central Water Quality Laboratory at Ubungo, for analyses.

4.4.7 Existing information on water sources

Water sources in Tanzania

The major sources of water supply in Tanzania are surface and groundwater sources. Surface water resources consist of lakes, namely, Lakes Victoria, Tanganyika Nyasa, Rukwa, Babati, Duluti, etc; rivers like Rufiji, Ruvuma, Kagera, Songwe, Pangani, Ruvu, Sigi, Malagarasi, etc; streams and natural man made reservoirs. Groundwater sources are found in shallow or deeply situated water aquifers. There are about 5,000 deep boreholes known to have been drilled countrywide with some of them not operating due to several reasons which include pump failures and resource depletion. Numerous shallow wells have also been constructed ranging from dug wells and auger holes to bored wells. The actual number of these shallow wells has been difficult to quantify.

Rainwater is another source of water, even though the rainwater harvesting technology has been practiced only at rudimentary level and in a few areas in the country.

Water sources region-wise

The table below shows the type of water source for each region in the country.

No	Name of Region	Type of Water Source				
		Surface water	Groundwater	Dam	Charcos	Rain water
1.	Arusha		boreholes spring			
2.	Coast	Rivers, Wami Rufiji	s/wells, b/holes	+	+	+
3.	DSM	Rivers Ruvu Mtoni	b/holes s/wells			
4.	Dodoma		b/holes s/wells spring	+		
5.	Iringa	River Little Ruaha	s/wells			
6.	Kagera	L.Victoria River Kagera	s/wells			+
7.	Kigoma	L.Tanganyika Rivers	b/holes spring			
8.	K'Njaro	Rivers	b/holes s/wells spring	Nyumba ya Mungu	+	+
9.	Lindi	Rivers, Matandu, Mavuji, Lukuledi, Mbwemkuru	s/wells	+		
10.	Mara	L/Victoria	b/holes, s/wells		+	
11.	Mbeya	Rivers Streams	deep b/holes s/well			
12. 2.	Morogoro	River	s/wells, spring	Mindu dam		

13.	Mtwara		b/holes,s/wells	+	+	
14.	Mwanza	L.Victoria Rivers, Stream	deep wells,s/wells, spring			
15.	Rukwa	Rivers	b/holes,s/wells spring	Mkulama dam		
16.	Ruvuma	River	s/wells			
17.	Shinyanga	River	s/wells,b/holes,sand wells	Ningwa dam		
18.	Singida		b/holes			
19.	Tabora	River	s/wells,b/holes	Igombe dam		
20	Tanga	Rivers	b/holes/wells	Sigi dam		

4.4.8 Recommended areas of information up-dating

A water source data bank, fir water quality and quality, should be built and maintained.

A Water Master Plan on utilization of Lake Victoria waters should be prepared.

The groundwater potential should be estimated all over the country.

Preparation of the hydrological Year-Book should be revived and maintained.

Water Master Plans for Dar es Salaam/Coast and Dodoma should be updated.

A National Water Master Plan should be prepared.

Collection, storage and dissemination of rain fall, stream-flow and lake water level data should be strengthened in the hydrology section.

4.5 Existing conveyance abstraction practice

4.5.1 Introduction

It is logical to discuss existing conveyance and abstraction practice by mentioning the major types of water sources in Tanzania and water law as it exists in Tanzania and the priority for granting water rights.

Water sources: Major water sources in Tanzania include the following:

- Surface: pumped/motorized;drawn on site
- Surface: gravity, drawn on site, gravitated, pumped

- boreholes: pumped/motorized, medium hand pumped
- shallow well - medium pumped/motorized, hand pumps, drawn on site.

Priority and grant of Water Rights

In Tanzania the priority for granting water rights is as in the following list (in order of priority)

- Domestic
- Livestock
- Irrigation
- Industrial
- Generation of power
- Transport
- Recreation etc.

Water Rights are granted to registered applicants by the respective Water Offices and Water Boards after some specific procedures have been followed.

The above categories of use of water are classified in order of priority as a GUIDE only not as a directive; however use of water for domestic has a prior right for all other uses.

Each application and each water right granted is registered but has its own file, renex cards etc.The Central Register has by December, 1993 recorded .... applications. Some applications are registered in the Regions and no copies are sent to head office for records. Hence this makes the Central register not be up to date. The system of data collection, analysis and storing should not be computerized so that retrieval of any storing should now be example of water used in each category, a summary of Great Ruaha Sub-catchment up stream of Mtera Dam as summarized from the files. The records cover a period of over 40 years.

4.5.2 Abstraction - Conveyance, Practice, Procedure

Applicants for water rights submit their requests to gather with dully filled application forms. In the form, the applicant is must put down the present water demand and (purpose) type of use(s), amount to be quantified, area of operation for irrigation use, how the abstraction is going to be carried out (any construction works?) - time of completion of construction works. The above categories of use of water are classified in order of priority as a GUIDE only not as a directive; however use of water for domestic has a prior right for all other uses.

Each application and each water right granted is registered but has its own file, renew cards etc. The Central Register has by December, 1993 recorded ..... applications. Some applications are registered in the Regions and no copies are sent to head office for records. Hence this makes the Central register not be up to date. The system of data collection, analysis and storing should now be computerized so that retrieval of any information is easy. As an example of water used in each category, a summary of Great Ruaha Sub-catchment up steam of Mtera Dam as summarized from the files. The records cover a period of over 40 years.

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Summary of water abstractions within the catchment regional wise shown in Table 4.2

Table 4.2 Summary of water abstractions

NO.	Purpose	Regions					
		Iringa	Mbeya	Dodoma	Singida	Total	% Total
1.	Irrigation	1170.885	2600.575	-	-	3771.463	44.159
2.	Domestic	52.584	2.921	0.590	-	56.095	0.656
3.	Domestic+Irrigt.	38.087	415.281	3.484	-	456.852	5.349
4.	All Purpose	39.152	2.462	-	-	41.614	0.487
5.	Hydropower	3938.597	43.454	-	-	3982.052	46.625
6.	Others	104.976	37.680	8.871	0.046	232.473	2.722
	Sub-Total	5344.181	3102.384	0.046	8540.548		

Further procedures include a hydrological report of the area and water quantity at the point of abstraction; report from the district Agricultural Development officer; a report from the District Administrative office. If there is no objection (all reports) to the applicant, the application after some gazetting (40 days) is sent to the Board for deliberation and decision. In the first instance a provisional water grant is given and when construction works are completed, after inspection and reported satisfactorily, a final water right (certificate) is granted. Part II - ch 6-7 - Act No 42 of 1974. The same bodies can reject an application. The applicant if not satisfied can appeal to appellate authority e.g. Minister for Water or the Regional Commissioner whose decision in the matter will be final. (Part vii ch 32,42 of 1974).

4.5.2.1 Types of Water Rights

In general "A Water Rights" is a right granted by law to take possession of water occurring in a natural source of water supply and direct the water and put it into a beneficial use or in connection with land. Principal Types of Water Rights are briefly defined

(a) Riparian Right - owner of land borders a natural stream or lake is entitled to take water for use on this riparian land

(b) Appropriate Rights - acquire a right to use water for Irrigation of a particular land or other use by diverting. This is the principal type of water rights in the Republic.

(c) Corrective Right - land owner with a percolating ground water is entitled to abstract that water. However the user must apply for a water right to use it.

(d) Perspective Rights - Divert to his own use, affecting other existed riparian users situated on site or downstream

(e) Private Water Right - Owner of the land on which water occurs acquires sole and exclusive right to the use of that water

4.5.2.2 Conveyance Practice

Depending on the type of Water Sources and type of water rights the methods of conveyance differ. There are designed projects where studies have been carried out before, appropriate points have been selected for intake/off take, rising main, distribution lines, open channels and other structures. Where an application is made through the respective offices and Board all data pertaining to the point of application is known. However cases exist where there are projects designed, constructed and commissioned without any water rights applied for before hand in public and private institutions. According to the water right definitions, riparian land holders most of them do not have water rights. These include most villages in rural areas (water supply and traditional irrigation-furrows).

The type of water source would govern the design of the projects, type and mode of draw off, if it is drawn as a point source or if it is transmitted by motorized pump, pipes or canals. If there is insufficient data on the existing water balances of surface flow and underground flow, there is a danger of over drawing some of water sources within a few years to come.

4.5.3 Recommendations

In order to encounter the problems mentioned in 4.5.2.2. above it is recommended that

(i) All existing water sources/supplies-water should be checked and registered, regional wise/basin wise. A comprehensive databank would be appropriate. It could be regionally or basin-wise managed but the data should be centrally accessible at the Ministry's Headquarters.

(ii) All existing water projects without water rights should be checked and granted water rights if found appropriate.

(iii) Proposed water application and water user fee be effected soonest.

(iv) Make a follow up and monitor quality and quantity of new water projects, register and issue water rights. Re-check and re-issue water rights periodically.

(v) Revisit to the water right Act in order to certify the defects such as period of abstraction after granting the certificate of a right.

Logistic Support

The recommendations stated in 4.5.3 above cannot be fulfilled unless logistic support is given to such a programme. The support should include:

- Transport/vehicles/fuel
- Operational funds
- Instruments, equipment for water quantity/quality measurement and analysis
- Personnel allocated to the unit
- Data loggers, computers and communication facilities for efficient acquisition, storage and retrieval of data

4.6 Shared international waters

4.6.1 Study of Existing Agreement

It is observed that the relation of a border river or international water course is hardly possible without the co-operation or consent of the state on the other side of the river. To facilitate the above some riparian states have opted for a joint commission but in other cases the legal question relating to the regulation of an international water course has been settled by an agreement between the states concerned as will be shown hereunder:-

(i) Existing Agreements - Nile Water Agreements of 1929 & 1959

The Nine Water Agreement of 1929 was a tripartite treaty between the United Kingdom, the Sudan and Egypt. The provisions of the Agreement purported to apply to territories "under British Administration" which included Tanganyika by then, and the thrust of the Agreement was to the effect that no irrigation or power works or measures are to be constructed on the River Nile or its tributaries, or on the lakes from which it flows to the prejudice of Egypt interest. Up to 1959 the general provisions of the Nile Water arrangements mainly negotiated at a technical level. In 1959 the Sudanese and Egyptian Governments negotiated an agreement styled as "Agreement between the Republic of the Sudan and the United Arab Republic for the full use of the Nine Water".

In general terms and amongst other things, this agreement recognized Sudan's right to a larger share of water, and confirmed the prescriptive right laid down in the 1929 agreement. Moreover the agreement covered the situation arising from the construction of the High Aswan Dam and provided for the establishment of a permanent Joint Technical Commission to function inter alia as machinery for negotiations with other states (then Tanganyika). Kenya and Uganda were members of the East African Nile Waters Co-ordinating Committee which was set up in 1956 specifically to ensure the establishment and maintenance of a common East African case and point of view on the Nile Waters.Although the Committee consisted nominally of three Ministers concerned or their Principal Secretaries - experience hitherto has shown that these Ministers have never met together,and this Committee has changed names overtime and the usual participants are technical officers and occasionally,administrative officials (for instance those concerned with foreign affairs). Informal technical talks abounds, but nothing concrete is forthcoming.

Tanzanian's stand to the two agreements is clear, that the two agreements are void because the United Kingdom did not have the

competence to conclude such an agreement affecting Tanzania permanently knowing the Trusteeship was temporary. However, the Government has over time expressed its willingness to enter into discussion with other interested riparian states regarding the division and regulation of the waters of Nile in a just and equitable manner. Notwithstanding the Tanzania position, Egypt has categorically stated as far as they are concerned the Nile Water Agreement is still binding on all parties.

Where such agreements of this kind exist, legal problems relating to regulation and utilization of water must be settled by reference to the general principles of international law of water i.e the Principles of Helsinki Rules of 1966 which stipulates that "Co-riparian States should refrain from unilateral acts or omissions that affect adversely the legal rights of a Co-riparian States in the drainage basin so long as Co-riparian States is willing to resolve differences as to their legal rights within a reasonable time by Consultation....."

Otherwise under the terms of the two purported agreements Egypt and Sudan are out to limit the utilization of the Nile Waters in the upstream States i.e Tanzania, Uganda, Kenya and Ethiopia.

(ii) Protocol on the Zambezi River Basin

The Treaty on SADCC - Southern Africa Development Community comprising of Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, Swaziland, Tanzania, Zambia and Zimbabwe was ratified by member States in 1992. In order to develop and utilize resources of shared SADCC Water Course System i.e Zambezi which flows from Songwe Mbeya Region downwards via Malawi, Zambia, Mozambique, Zimbabwe and Namibia a protocol under the Treaty has been finalized and is awaiting ratification by Member States.

The general principle of the protocol inter alia includes that member states to respect and apply the existing rules of customary international law relating to the utilization and management of the resources of international water courses. Member States lying within the basin of a shared watercourse shall exchange available information and data regarding the hydrological,water quality and ecological condition of a such water course.

The thrust is that,if for instance, a riparian state is preparing a hydro technical project must know in advance among other things whether there are any legal barriers to its realization in order to determine whether the project is in agreement with rules and principles of international law, account should be taken of its environmental and other consequences, particularly of its probable effects on the basin.

In case the undertaking is likely to affect the rights or interests of other basin states, which include their share in the beneficial uses of the basin, an assessment on the basis of international law and particularly under the provisions of Helsinki Rules would be necessary. The Protocol has been modelled along the lines of the Helsinki Rules of 1966.

(iii) Agreement for the establishment of the organisation for management and development of the Kagera River Basin

The above agreement involving Burundi, Rwanda, Tanzania and Uganda was initially signed on 24th August, 1977 and was revised on 22nd April 1990. The territorial jurisdiction of the organisation is the area drained by the Kagera River and its tributaries and subtributaries. The headquarters of the organization is at Kigali Rwanda. Broadly speaking the objective of the organization is to deal with all questions relative to the activities to be carried out in the Kagera River Basin notably water and hydropower resources development. However it appears due to financial constraints, many activities as envisaged by the Agreement have either grounded to a halt or very small activities are going on.

4.6.2 Proposals as to how best Tanzania can utilise these waters with due consideration to all riparian neighbours

Although Tanzania's stand remains unchanged on the Nile Waters Agreement, however political will among the riparian states to resolve Nile shared water course in line with the internationally accepted rule which govern the Co-operation in the development of shared waters - Helsinki Rules 1966 should be encouraged.

- Shared water course and related facilities should be used exclusive for peaceful purposes consonants with principles enshrined in the Charter of the United Nations.

- The decision to embark upon a joint undertaking should not, be made without a prior investigation of the economic, technical and legal rights upon the rights and interests of states concerned.

- Exchange and utilization at flood mitigation and promoting environmental protection measures on the shared water courses.

4.7 Rainwater harvesting practices in Tanzania

4.7.1 General

Rainwater harvesting is a process of collecting rainfall from natural or prepared catchments. Runoff is the portion of rainfall that runs off slopes before it evaporates or infiltrates into the soil. In many developing countries, water resources remain underutilised. Temporary ponds formed during rainy season often serve as water sources for domestic and agricultural uses. However, much rainwater runs off the land without being harvested for future uses. Beneficial uses of harvested water include household needs, such as washing clothes and dishes, drinking, bathing, livestock watering, irrigation and fish farming.

Rainwater harvesting is practiced in most arid and semi - arid regions where no other alternative water sources are economically available. Most rainwater is lost by infiltration into soil or runoff unless it is captured and store. Though rain falls infrequently in arid and semi-arid areas, it often occurs in high

intensity. Important components to be considered in preparing a rainwater harvesting system are catchment areas (size, soil, cover and slope), collection and conveyance, storage and water use. Without an adequate storage system, most rainwater harvesting systems will fail during drought. The type and size of storage systems for the harvested water are determined by the uses of water.

When harvested water is used for runoff farming, the storage system is the soil itself. Harvested water can be directly stored in soil with certain augmentations.

When water is to be used for livestock watering, fish production, irrigation or human consumption, a storage facility has to be provided. Dug-out ponds or impoundments built at the lower end of a catchment area are usually suitable for storage. Water cisterns are used to tore harvested water from roof catchments.

Harvested water at the end of the rainy season usually is stored for use during the dry season. The size of the storage system is determined by the use of the water until the next rainy season. However, due to the cost to collect and store large volumes of rainfall in arid and semi-arid areas, large scale crop irrigation with harvested water may be infeasible.

Despite the pressure to provide adequate and safe drinking water supplies in arid and semi-arid areas, this water supply technique is still not used as widely as it should be. This practice has neither been accepted as a competitive method for providing water supplies.

Many countries do not incorporate rainwater harvesting systems into their water development plans. This is partly due to the little emphasis placed on rainwater harvesting by the financing agencies in water supplies. Usually groundwater over surface water is preferred as a source of domestic water supply. The World Health Organization however ranks rainwater fourth as a source of domestic supplies. Lagging behind groundwater needing no treatment, spring water, and groundwater needing little treatment.

4.7.2 Rainwater harvesting methods

Rainwater can either be collected from roof catchments, artificial surfaces or land surfaces. Artificial surfaces are developed by treatment of soil by applying chemicals to stabilize the soil or covering the soil with other materials. The most common practice of rainwater collection in Tanzania is from roof catchments and land surfaces. Rainwater collected from roof catchment gives clean water for domestic use, while rainwater collected from land surfaces provide suitable water for livestock, fish farming and irrigation. The two methods of rainwater harvesting are discussed below.

4.7.3 Rainwater harvesting from roof catchments

The practice regarding the use of rainwater collected from roof catchments for domestic purpose in Tanzania is at a rather poor

stage of development in many homes and communities. In many cases the rainwater is collected on a daily consumption basis, with no storage facilities for longer periods. However, well developed systems are in use in institutions such as missionary centers, schools and health centers.

Rainwater harvesting from roof catchments has the following advantages and benefits over the other sources.

- The catchments are easy to design, construct and maintain.
- Very high purity water can be collected, making treatment unnecessary, and ensuring good health of the people.
- The water is easy to tape and can be collected next to one's door, making the need for long expensive pipelines unnecessary.
- The supply is readily acceptable to the community because the water is of good quality characteristics and is of traditional origin.
- Roofs provide an in expensive impervious collector surface without any additional cost.
- No elaborate machinery is required and in many cases even pumps are not required.
- Collecting rain from roofs may prevent soil erosion around the house unless proper drainage gutters have been provided.
- The walking time saved by the women folk and children, since the supply will be next to their house, can be used for other activities.

Roof catchment system

The roof catchment system consists of a roof catchment to collect rainfall, gutters and piping to collect rainwater from the roof catchment and storage tank to store collected water.

(i) Roof catchment

Rainwater may be collected from any kind of roof. Metal or tiled roofs are easier to use, and may give the cleanest water. Rainwater collection from thatched roofs is also possible but the quality of water is not very good because it contains organic matter, colour and smells of decomposed leaves. For this reason, thatched roofs should be used in conjunction with a simple filtration device using crushed charcoal, sand and gravel as media.

The ideal roof catchment is an aluminum sheet roof, but since it is likely to be expensive, it is recommended that galvanized iron sheet roofing be used. The sheets should be sloped in a gentle manner to enable the rainwater to flow to the gutters quickly but with little splashing on impact at the gutters. The situation in

Tanzania is such that many houses have either galvanized iron sheet or grass thatched roofs, while a few have either asbestos or tiled roofs. From the point of view of efficient rainwater collection, grass roofing will have to be replaced by galvanized iron sheets. Roofs should not be painted, but if painted, the paint should be non-toxic.

(ii) Guttering

Gutters receive rainwater from the roof catchment and discharges it into the pipe leading to the storage tank. The type of gutters used and their arrangement will affect the yield from the roof catchment. The best gutters in use are galvanized iron, which are most durable and require least maintenance, but expensive. Cheap local materials can be used as an initial alternative especially at household level. Such alternatives may be timber, bamboo or PVC pipes. Gutters should be provided with a cross-section large enough to channel water from heavy rains without overflowing and also should be placed at a uniform slope to prevent water from pooling or overflowing the gutters.

(iii) Storage tank

A storage tank is the most important and expensive component in a rainwater harvesting system. Since the rainfall distribution follows a detrain annual pattern, it is essential to collect and store rainwater during the rainy season for the later use during the dry season. Lack of adequate rainwater storage facilities is a major drawback in utilizing rainwater in the country. Some villages have good roof catchments but no storage tanks. In many cased the people use only simple containers like earthen ware, tins and used oil drums for their water storage.

Requirements of storage tank include adequate storage volume to store sufficient water all year round, especially, during dry months, when water is likely to be in short supply; adequate enclosure to prevent contamination from humans and animals, leaves, dust and other pollutants; a tight cover to ensure dark storage conditions so as to prevent algae growth and the breeding of mosquitoes and also presence of a hole at the top of the tank, large enough, for someone to enter the tank for cleaning and repair. It is important also that tanks are calibrated before use so that withdraws can be monitored.

Various types of storage tanks are in use in different parts of the country, depending on the material of make e.g. concrete corrugated steel sheeting, wood, clay, etc. The plan of the Tanks may be either square, rectangular or circular. Rectangular tanks are the simplest to roof while large circular tanks are the most difficult to cove. Storage tanks in common use include the following:

Traditional Basket Jar

The construction technique involves forming a basket from locally available shrubs and sticks. Cement mortar is then plastered over the shrub frame and set into a concrete base. This storage tank can give a volume up to 2.3 m3.

Metal Sheet Tank

These tanks have been used for many years in many areas. They are the quickest and easiest ones to install, but they have to be purchased. Apart from being costly, the corrugated metal from which these tanks are made may not last longer in a damp climate, even though they may be galvanized.

Concrete Block Tanks

These tanks are strong and are easy to build. However, because a lot of cement is used in their construction they are very expensive. Because of their great tensile strength they can be built to provide a large storage volume.

Ferrocement Tanks

Ferrocement tanks are constructed of reinforce wire plastered with cement mortar. The main advantage of ferrocement tanks is that they use commonly available materials i.e. cement, sand, water and wire. Simple skills are required to construct a ferrocement tank. Basic hand tolls are used in the process of construction. for these reasons ferrocement tanks are a suitable technology for low-income rural areas. The cost of ferrocement tanks is cheaper compared to other tank construction material such as galvanized metal and also the technique requires less total material than conventional concrete tanks.

The use of ferrocement tanks in Tanzania is relatively a new thing. The African Medical Research Foundation (AMREF) build the first demonstration tank at Iringa in 1989 in an effort to promoting the use of ferrocement tanks in Tanzania. An additional tank was build at Chalinze dispensary in February 1990.

Design of rainwater roof catchment system

The initial step in planning a rainwater roof catchment system involves an appraisal of the feasibility of the system technically. The foremost concern is on water availability as compared to its use or demand. the yield or supply of the system depends on how much rain falls during the year and the variability of the rainfall. The demands imposed on the system depend on water use. In the household, water is used for drinking, cleaning, cooking and washing.

Reliable rainfall data are required when determining the supply from the system. Rainfall data for at least a 10 year period is required for the analysis. this information can be obtained from the meteorological or hydrological offices in the country. The next step involves estimating the total annual demand and comparing it with the supply possible from the rainwater catchment area. If the supply exceeds the demand then the rainwater roof catchment feasible from the technical point of view based on total maximum supply over the period of a year. If the supply is less than demand, then possible solutions include increasing the catchment area or reducing the demand for rainwater.

The design stage of the rainwater roof catchment system involves sizing the storage tank. The tank volume can be determined by the following methods.

(i) Dry season demand versus supply

This approach considers the length of the dry period as a design constraint. The tank is designed so that it accommodates the household needs during the dry season. For this reason, the method is most appropriate where there is a definite wet/dry period during the year.

Estimation of demand

In order to estimate the total water requirements for a small family or large community, an inventory of all the water consumers must be made, their daily consumptions must be known and the number of dry days if rainwater is to be used as a source of supply. The following relationship may be used for the estimation.
Volume of water required to last through the dry period
= No. of persons x daily consumption x no. of dry days. m3/sec

To take care of any eventualities like extended draught, this volume should be increased by 30 - 50 % to give extra security storage. The length of the dry period can be estimated by estimating from rainfall data the number of consecutive dry days per month.

Estimation of supply

The following relationship should be used when calculating total runoff from a roof.

Total supply

= Roof area x annual rainfall x runoff factor, m3/sec.

The runoff factor is applied to correct the losses due to evaporation and splashing from roofs and gutters and it is a function of roof catchment.

Values of run-off factors from different catchments are given in Table below.

Catchment	Run-off factor (ROF)
Uncovered catchment surface	
- Completely flat terrain	0.3
- Sloping 5-10%	0.5
Covered catchment surface	
- Corrugated metal surface	0.8 - 0.9
- Roof tiles	0.8 - 0.9
- Concrete bitumen	0.7 - 0.8
- Brick pavement	0.5 - 0.6
- Compacted soil	0.4 - 0.5

The dry season demand versus supply method gives only a rough estimate of supply and demand. However, it does not take into account variations in annual rainfall pattern.

(ii) **Mass curve analysis**

A more accurate method of sizing a tank involves analysis of rainfall data using the mass curve technique. At least 10 years of data is required for successful use of the technique.

Initially a run-off factor is determined to correct the losses during collection from the table provided above. this factor is multiplied by the monthly rainfall values and the catchment area to obtain the monthly supply values. The monthly supply and demand values are then used to construct cumulative supply and demand curves when the demand curve is placed on top of the supply curve tangentially at several crest points of the supply curve gives the required storage volume.

Design considerations which need to be noted in the design of rainwater cisterns include the following:

1. Arrangement for flushing out or by-passing water from the first rains should be provided so that this water does not directly go into the reservoir. this water is usually not clean.

2. Storage tanks should be covered to reduce evaporation, off sunlight and contamination from dust.

3. the inflow should be filtered at the entrance to the reservoir to remove any foreign bodies.

4. Where sub-surface storage is use. the flow should be covered with an impervious lining like plastic of polythene sheets.

5. The tanks should be constructed in such a manner to facilitate easy cleaning.

6. The tank floor should be gently sloped away from the tap. so

that any sediments will settle away from the tap and thus keep it free from clogging.

7. Corrugated galvanized tanks should be laid on wooden supports placed on raised cement platforms to ensure that the outer bottom surface is kept dry all the time to reduce corrosion risk.

8. The houses from which the rainwater is to be harvested should be carefully planed so that savings in guttering and pipelines can be realized.

4.7.4 RAINWATER HARVESTING FROM LAND SURFACES

4.7.4.1 General

Another method of rainwater harvesting is by collecting rainwater from land surfaces and storing the collected water in surface or sub-surface reservoirs. This method is specifically useful in solving the water problem in arid and semi-arid regions which experience serious water deficits during the dry season. Storage reservoirs are used to store rainwater during the rain season in order to preserve it for use during the dry season.

The form of reservoirs in use in different parts of Tanzania include small dams, charcos, and sub-surface dams. A small dam is generally constructed to impound the waters of a stream. High construction costs, evaporation losses, pollution risks and siltation problems make the use of small dams less applicable.

The use of sub-surface dams and charcos are good alternatives for storing water in arid and semi-arid rural area. The use of sub-surface dam and charco techniques are discussed below.

4.7.4.2 The use of sub-surface dams

The documentation on the use of sub-surface dams in Tanzania is very limited. The known sub-surface dams are constructed around Dodoma (Bihawana and Kikuyu). However, the potential to use this technique in arid and semi-arid regions of Tanzania for domestic and livestock use in high.

Sub-surface dams are developed by building a barrier across a send river to retain water in the sand. Sand rivers are common in arid and semi arid-area, and therefore the technique of sub-surface dams can be applied in these areas. Water can remain in the sand (up to one quarter to one third of the volume of the sand) after the flood waters have passed and then water slowly seeps away through the sand downstream.

Sub-surface dams are easy to design and construct because surplus run-off just passed over the roof of the dam without damaging it, thus no spillway design is necessary. Other advantages of this technique are:

1. As part of the dam structure, coarse sand and gravel particles are required in the storage reservoir. Silting

is therefore not a problem.

2. Water is stored between the coarse send so evaporation is eliminated to almost zero.

3. Mosquitoes and bilharzia parasites cannot breed in a subsurface reservoir.

4. Because people, livestock and wild animals are not sin contact with water it is easier to prevent contamination.

5. Requires limited operation and maintenance.

DESIGN OF SUB-SURFACE DAMS

The topographical conditions govern to a large extent the technical possibility of constructing the dams as well as achieving sufficiently large reservoirs with suitable recharge conditions and low seepage losses. It is preferable to site sub-surface flow dams in well-defined narrow valleys or river beds and on tight bedrock foundation. This reduces costs as well as makes it possible to asses storage volume and to control possible seepage losses. Storage volumes have to be maximized keeping the dam height as small as possible.

Important factors to be considered when designing sub-surface dams are described below:

(i) **Bed rock foundation**

Sub-surface flow dams should be founded and anchored in solid rock. In order to achieve good stability, and in most cases to control seepage below the dam. If the rock is weathered it is important that this profile is fully excavated before the dam foundation is made, otherwise there will probably be a seepage below the dam. When the rock is reached it is important to investigate possible open fractures.

(ii) **Water storage capacity**

Water is stored in sub-surface flow dams constructed across dry river beds when flood waters enter the space between the sand particles. Sand deposits are used as storage reservoirs. The storage capacity of sand deposits depends on the porosity of sand.

The greater the porosity of sand particles the greater the storage capacity. Water storage capacity is a function of porosity and storage volume of sand deposits. Theoretically it is estimated from the formula:
Water storage (m^3) = Porosity (%) x storage volume m^3)/100.

Porosity can be estimated from the laboratory while storage volume can be estimated from simple geometry of the river bed.

(iii) **Specific yield**

Specific yield (%) = (Volume of drained water/total volume) x 100.

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CONSTRUCTION OF SUB-SURFACE DAMS

The easiest and cheapest method is to construct a clay dike across the river bed of which rests on the solid bedrock of the watercourse. Clayey soils are generally available close to any construction site which means that they can be excavated and transported to the site at low cost. The use of clay is a labour intensive alternative and there is no need for skilled labor. Possible drawbacks are the large excavations generally required and the need for compaction.

Other methods involving more advanced engineering for which skilled labor is needed include construction of concrete. Stone masonry, ferro-concrete or sheets of steel dams across the river bed.

A sub-surface dam is always combined with a drain along the upstream base of the dam. The function of this drain, which generally consist of gravel, perforated concrete ring or slotted pipe surrounded by a gravel filter, is to collect the water and transmit it to a well. The well through which water from the dam is generally extracted may be placed in the reservoir or in the river bank.

4.7.4.3 Use of charcos

Charcos are water storage reservoirs that are increasingly being used in cattle keeping areas. Charcos are reported to exist in the following regions: Dodoma(3), Singida(13), Shinyanga(more than 15), Mwanza (more than 15), Tabora(3), Arusha(15) and Mara(47), Charcos are ideally suited to areas where the populations is well scatted, and where da large number of small water supplies is required.

A charco is a sub-surface reservoir, which can be constructed to any size within limits, but those normally constructed in Tanzania have a capacity of 7000 m^3 and have a depth of 5 meters. The sub-surface reservoir is surrounded by a band to prevent the entry of water except by the inlet pipe. Another system of bunds is provided as guide arms to lead run-off into a de-silting area, form which partly de-silted water is lead by pipe into the sub-surface reservoir. A de-silting basin is provided to reduce the deposition of material on the bottom of the charco and so prolong its life.

Water can be withdrawn from the charco by means of the well constructed on one side and connected to the charco by a gravel filter. Alternatively, if the charco is for livestock only the animals can be allowed to enter the charco from one side.

Advantages of a charco over the small dam are:

1. Usable water in a charco is of much greater percentage of the total stored than in a small dam because of the greatly reduced surface area and the fact that the band of the water is stored in depth below ground.

2. The cost of a charco is about one sixth of the average cast of a dam and therefore it is possible to construct a number of

charcos fairly evenly distributed and supply an area to much greater advantage.

3. The maintenance of a charco is extremely easy and cheap.

Design of Charcos

Charcos are best cited in open, rolling or flattish plains, where well defined streamlines and valleys are scarce, but where the depth of impervious material below the ground is considerable (preferably up to 6 meters)

The ideal catchment size for a 7000 m^3 charco is 16 to 32 hectares. If a larger catchment, particularly if the area is fairly flat and uniform a deflector drains can be dug to divert surplus water around the charco. It is encouraged to plant sisal or thorn to enclose the catchment. No cultivation should take place within the catchment and it is important to ensure that grass cover is neither over-grazed no allowed to grow to a height which would impede the collection of water in extremely flat areas.

In order to examine the suitability of the material in which the charco will be excavated, bank holes should be drilled to a depth of 6 meters over the site. If rock is present below, the site should be abandoned, as the cost of excavation is likely to be prohibitive.

CONSTRICTION OF CHARCOS

In setting up a charco it is important to make sure that the silting basin has the required capacity. Also guide arms should be set at the required angle to collect run-off from the selected catchment area. At times it may be necessary to cut a shallow furrow as an extension of guide arms to direct run-off into the charco or to cut a deflector drain to reduce the catchment area

Construction is best carried out by machinery, either by push loaded scrapers, or by a large bull-dozer on its own. Excavation by hand is not likely to be successful because of the material at depth is likely to be extremely hard. A small labor force will be required after the main earthmoving is completed to install the inlet and outlet system, construct the well, and trim the embankments.

4.7.5 Deficiencies in rainwater harvesting practices

The following deficiencies are noted with regard to the use of rainwater harvesting systems.

Lack of rainfall data in many areas make it difficult to properly design a rainwater harvesting system.

Collection of rainwater in urban areas, the quality may be affected by atmospheric pollution where sulfur dioxide and carbon dioxide from vehicular traffic, coal fired power stations or industrial fuel gases can convert the composition or rain to acid rain.

Collection of rainwater in cisterns attach growth of organisms and larvae that could promote diseases like malaria.

Water stored in underground cistern can be contaminated by leakage from septic tanks in the proximity adding nitrates and phosphorous.

Dropping from birds making their habitat on roofs or over trees overhanging the roofs usually collect on roofs and gutters thus causing pollution on rainwater collection system.

Storage of rainwater in cisterns either above ground or below ground and covered under tropical conditions, can suffer from anaerobic conditions, due to trace of organic matter.

In the case of water cistern not roofed, the high evaporation rate in the tropics result in a lot of stored water being evaporated and the reservoir can get dry before the next rainy season.

Since a storage tank is usually the most expensive part of a rainwater harvesting system, it is a rather common practice to build a storage reservoir too small. This result in a storage reservoir getting dry before the next rainy season.

Some sections of the population have low opinion the use of rainwater collected from roof catchment due to reasons linked to traditional myths.

sub-surface dams are not convenient everywhere. The require a suitable geological and topographical formation, aquifer rich in sand and gravel deposits and reasonable walking distance to the consumption ares.

Poorly designed and managed systems can cause soil erosion and soil instability. The eroded soils eventually cause problems in dams and charcos.

4.7.6 Recommendations for effective use of rainwater harvesting systems

In order to ensure effective use of rainwater harvesting systems the following recommendations are made:

The designers have to take into consideration the local conditions of rainfall, evaporation and consumption.

Consumers have to build enough storage capacity to be self sufficient.

Controlling the daily consumption is necessary to conserve water to last over the required dry season.

Proper maintenance of the system is necessary to reduce wastage of water

There is need to educate the people on the need to use rainwater harvesting systems for domestic and livestock purposes. Many people do not realize that it is better quality water than that from

other sources like rivers.

People should be assisted financially in constructing rainwater harvesting systems.

People should be urged to put up more galvanized iron roof houses as this has been found to be the best roof catchment.

Free design or similar advice should be provided when needed.

The Government to enact comprehensive environmental protection laws, since rainwater harvesting from roof catchments is very sensitive to aerial environmental pollution.

Feasibility studies on the possible use of rainwater roof catchment system as a source of water supply for urban centers to be carried out.

The technology of rainwater harvesting should be promoted among livestock keepers, irrigation and water supply users.

Catchments used to collect rainfall should be protected from interference with human or animal activities to limit pollution of run-off from these catchments

In developing a rainwater harvesting system, there is need to take care to minimize soil erosion and sedimentation.

If a rainwater harvesting campaign is launched in Tanzania, a new source of clean water supply will be ensured at household level, and pressure on current clean water supplies resulting from the fast growing population and the even faster-growing socio-economic development will be eased.

5. COMMUNITY PARTICIPATION

Community participation in water supply activities has been a common practice especially in rural areas of Tanzania. People in villages are known to have cooperated in digging wells or in constructing furrows etc. Although involvement of people in water activities was a known fact yet the water sector had no official policy on this matter. The Ministry/Department responsible for the development of this sector was somehow indifferent to the application of this approach.

External support agencies (ESA) and donors have been the first group to officially introduce the community participation strategy in government supported water projects. However the community participation which was introduced by the ESAs and donors was viewed mainly in terms of people contributing free and unskilled labour which was to be used in performing such activities as digging trenches, brick making, pipe laying, back filling, supplying locally available materials such as sand, gravels and stones. The community was not expected to be involved in planning, operation or maintenance of water projects. The envisaged gains in involving the communities were seen in terms of reduction in construction costs. A secondary gain which was often mentioned but no concrete efforts were made to achieve it was the creation of a sense of ownership among the intended beneficiaries.

This type of community participation has been practiced for over two decades now. In some donor funded projects no construction can start before communities sign an agreement that they are prepared to participate in the construction by contributing free labour. Essentially this type of people's involvement is what has generally been known as community participation in Tanzania.

It is only recently that government, through the Water Policy which was adopted in November 1991, has given official support to community participation as a development strategy in the water supply sector. It is stated in the Water Policy (para 62) that it is necessary to motivate and involve the people in all planning, construction, operation and maintenance activities of water projects if they (people) are to regard these projects as theirs.

However, community participation as defined in the Water Policy differs significantly from community participation as practiced in the past. The community participation which is being proposed in the Water Policy is not restricted to provision of free and unskilled labour, but it involves aspects of planning, operation and maintenance. It can be regarded as community participation not only in construction but also in planning, development and management. It calls for the community to be responsible for the management of the water supply projects. That is, the management should be community based rather than government based and calls for a completely new approach which relies more on people's initiatives and resources.

Government's adoption of the community participation strategy has been influenced by a variety of reasons both positive and negative. Through experience it has been found out that by applying a

community participation strategy which involves community based management system it becomes relatively easy to:

* achieve greater reliability

* tap adequate resources which the communities have for the management of the simple water supplies

* achieve improved cost recovery, which eventually leads to greater sustainability

* attain spin-offs in health improvements, income generation, and other community development activities

* promote more equitable water use and fairer charging systems.

It has also been pointed out in many fora that a shift from government based management to community management has been influenced by the realization that:

* agency-managed projects cannot satisfy demand and individuals cannot satisfy their needs alone

* government resources are inadequate to sustain completed projects

* people are unwilling to pay for the level of service provided by public systems.

5.1.2 Suggestions on how Local Government will timely respond to communities initiatives.

According to the Constitution of the United Republic of Tanzania, Article 146(i) reads:-

Local government authorities exist for the purposes of consolidating and giving more power to the people. The local government authorities shall be entitled and competent to participate, and to involve the people, in the planning and implementation of development programmes within their respective areas of authority and generally throughout the country.

It is within this framework that local authorities were established by Article 145 of the said constitution. Arising from these two articles of the constitution Acts No. 7 and 8 of 1982 were enacted. These Acts established local government in the United Republic of Tanzania coming into effect in January 1984. Prior to the establishment of local governments, there was a system called Decentralisation. Under that system of government power was deconcentrated from the center to the Regions and Districts. This did not enhance people's power because it was hijacked by the bureaucrats. As a result two important things developed.

(i) People slackened in participating in development or self-help ventures;

(ii) There were a lot of expectations by the people on the government to do things for them.

Since government had neither the capacity nor the resources to meet people's demands, development declined sharply. On realizing this the government re-established Local Governments in 1984.

Local government is based at the district, town, municipal, or city level at the appex. The lower level is a ward where a counselor is elected. Below the ward in rural councils there is a village headed by a village chairman. The lowest level is a "Kitongoji" which is a cluster of several households. Its equivalence in urban councils is a "Mtaa". All these levels are communities where developmental and social activities take place. As stated in the Constitution quoted earlier, these communities are supposed/expected to participate in the planning and implementation of development programmes within their areas of jurisdiction - ranging from the Kitongoji/Mtaa to the District/town level.

Despite the Constitution and the local government laws giving power to the people, development does not seem to pick up fast enough. This is reflected in the non or slow completion of the various development projects within communities. As one travels he finds incomplete water schemes, incomplete cattle troughs/dips, poorly constructed classrooms and teachers' houses, unroofed community centres, communal farms planted but full of weeds and things like that. This poses the question as to why such a situation has come to develop and how it can be remedied.

People will be able to participate fully in their development projects and the local governments will be in a better position to timely respond to communities' initiatives if and when the following steps will be taken at the different stages of project development:

Planning Stage

The first step is for local government to allow various communities to be masters of their plans. Once a Kitongoji/Mtaa, a village or a ward comes up with its plan the Council at the district level should not reject these plans outright. The District Council plan should therefore emanate from villages' or communities' plans.

Second, technicians at the district or town levels should not wait for plans to come from wards, villages, vitongoji/Mtaa levels. Instead they should join these communities at the planning level. Instead of criticising the plans at the district level or ward level they should participate where a plan is being conceived. This will enable the community involved in conceiving a plan to have the right technical input before a decision to embark on the implementation of the plan is undertaken. It will enable the community to look at the projects within a plan and decide right from the beginning as to what project will start and which one will be the last to complete the plan.

Third, planning at whatever level of the community should be done through a dialogue between the villagers and the technocrats. For

and their problems, costs, demands etc.
technicians discern various options with villagers (O/P)

example, if a village is thinking of a water scheme, the technocrat should at no time discourage people by saying it is impossible. He should carry them through the problem they are trying to solve and get them to appreciate the size and implication of the project. This will lead the villagers/communities to have full commital to their project once the scheme is started till completion. Once complete these people will ensure it remains safe and operational. If the goal of the water scheme was to decrease the incidence of diarrhea in a village, it becomes easy for the village to acknowledge the effectiveness of their scheme.

Fourth, involving the people at the planning stage will enable the plan to have a committed community. Each individual within the plan will know where he/she is required to participate, whether in contributing money, labour, or in stopping to do something which he/she used to do for the sake of enabling the plan to operate successfully. This could also mean that an individual has to part with certain equipment or contribute some equipment towards the implementation of the project.

When the community is involved at the planning stage it is very easy for every one in the community to participate during implementation. And later when the project is completed each member will feel obliged to protect the project against destruction or misuse.

Implementation Stage

As stated earlier the first intervention step is at the planning stage. At that level all details of the project and who is going to perform what are layed down. Which resources are within the means of the community and which resources are outside the community are known to all concerned parties. Each party in the plan is committed to participate in clear terms. Timing of implementation has to be spelt out clearly at the planning stage. How much money, tools, equipment and labour is necessary before physical implementation takes place is made clear. All these things will enable timely response to community initiatives.

One has got to look at the type of responses to community initiatives that will be needed at various levels. At the level of the district one has to start with the technological aspects which are necessary for formulating and planning purposes. Technicians have to be available. For example, if the implementation involves construction the Council has to have engineers/technicians. If it is a water scheme water engineers and health experts have to be available. If it is a training project teachers/instructors have to be available at the Council. A community might like to embark on a poultry or dairy project in which case livestock officers have to be available and so on.

These technicians must be equiped not only with knowledge but also with the techniques of approaching communities and imparting knowledge. This will enable them to mix with the communities freely and gain acceptability. It is therefore suggested that at a lower level technocrats be based at Ward level to meet these demands timely. This means the technocrats will be in easy reach and when

required.

These technocrats should be equiped with the right training to meet the peoples' demands technically. This should include objective oriented planning and community based project approach.

Another area that has to be looked at is finances. Presently the system of revenue collection is such that all revenues are sent to the Council headquarters. Thereafter money is dished out to projects in the Council plan. Those projects which are not in the Council plan do not benefit from these monies. Since the contributor to this money, for example development levy, does not see any project being partly financed by the council in his own area or even close-by he/she believes his/her contribution was wasted. Therefore in order to respond quickly to the people's initiatives it is suggested that the system of Council budgeting should change. At every level of government, namely Kitongoji, village and ward levels there should be a community development fund. A certain percentage of revenue collected by the Council via their by-laws should be left at these levels of management. This means that a pre-determined percentage of revenue per year should be left or given to these communities at various levels. For example, a Council could decide that one per cent of revenue collected from a Kitongoji/Mtaa should be retained at that level. Five percent of revenue collected by the District Council from a village should be left with the village government level. Fifteen percent of all collections from a ward should be given to the Ward Development Committee fund. This would mean that all those small projects which need small amounts of money could be implemented without waiting for higher levels financing. Also at the level of the district or town council it must be clear as to how much percentage of collections would go into development initiatives. Presently most collections from Council's own sources are spent on paying salaries and meeting recurrent expenditure costs. The masses do not see development arising from people's contributions such as levies. This has definitely to change.

Also one has to look at transport facilities for every level of expertise. It would be expecting too much, considering Tanzania's terrain, for example for a community development worker to cover ten villages in a ward on foot or a MCH Aider to cover several villages within her work area on foot carrying various equipment in her hands. Transportation has to be provided and the right transport facility would depend on distance and the work materials, tools and equipment which have to be carried.

Lastly, an incentive package for the technocrats whose participation on a particular project succeeds should be put in place. For example, if a health worker convinces people to use latrines in a village and people accept it he/she should be given some incentive. Remoteness of a working area could earn an employee an incentive. Of course these types of incentive packages and how they could be awarded could be looked into. All these could activate timely response to community initiatives.

5.1.5 Ways of Enhancing Community-Based Management

Since the Tanzania government has already decided on applying the community participation strategy and is in the process of transfering the management responsibilities of water supply projects to the communities, it is quite essential at this stage to identify factors which can enhance effective community management before such transfers are made. In what follows then an attempt is be made to identify these factors and how they can be applied in the promotion of community based management.

Experience gained from different water supply schemes in Tanzania and in other developing countries points to at least six factors which appear to affect positively the success of community based management. These factors are as follows:

1. Introduction of appropriate and adequate incentives
2. Development and application of appropriate and effective processes and procedures
3. Possession of skills and resources
4. Promotion of cooperative and organizational relationships
5. Application of appropriate technology
6. Establishment of monitoring, feedback and evaluation system(s)

Introduction of Appropriate and adequate Incentives

In Tanzania, operation and maintenance of rural water delivery systems has, with the exception of only three cases, been the responsibility of the District Water engineer. This has been so mainly because of the country's past policy of providing water free to rural communities partly as a basic service and partly as an incentive to people to participate in government designed development programmes. At one time in the history of the country people were moved to new locations with promises of being provided, "free of charge", with basic services of water, education and medical services. A call on rural communities to meet the costs of operation and maintenance is interpreted (at least by some people) as government withdrawal of the incentives which were intended to motivate people to participate in development programmes. How will the government of Tanzania which introduced the policy of "free" water make people accept the new role of meeting the costs of operating and maintaining water supply systems which hitherto have been run by the government?

Experience from other countries where community management approach has been introduced shows that when communities are properly motivated they are usually willing to participate in the management of their water supplies. It is crucial that the motivating incentives to be offered should be strong enough to overcome costs which the communities would incur in participating in the management of the water supply systems.

Benefits to be derived from easy access to potable water, sense of ownership and control of ownership by the community, and government recognition and appreciation of local people who participate in the operation and maintenance systems appear to be very strong incentives which would make people accept management responsibilities.

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In a study which was conducted in Newala District in Tanzania, it was found out that lack of easy access to adequate potable water was a major constraint to economic production besides being a threat to the community's health. However the study revealed that the people of Newala were willing to participate in the management of their water supply only if easy access to reliable sources of adequate potable water was guaranteed. Their willingness to participate was influenced by the expected savings in time and money which would be obtained as a result of easy access. This observation points to one very important factor, and that is, distance. Local communities are generally willing to participate in the management of a water supply system if it is going to bring water closer to their homes than their traditional sources or else they would fail to realise a saving in time and drudgery of carrying water long distances. This means that wherever local communities are called upon to participate in the management of the water system that system should be so designed as to minimize distance to be travelled.

Perception of ownership and control of water installations by the community is also a major incentive which appear to influence strongly the willingness of the local communities to participate in managing and maintaining the water supply systems. Definite steps of transfering ownership to the intended communities have to be taken to ensure that local communities perceive that the water delivery systems are really theirs. This step of making official tranfer of ownership is very crucial especially in Tanzania where the policy of government ownership of the service infracture has, in the past, been applied extensively throughout the country.

The system of water distribution may also have a great influence on the willingness of people to participate in the management of the delivery system. Allowing yard connection may motivate people more than where people would be required to collect water from a communal standpipe located several hundred metres from a homestead. In Tanzania where collection of water is a woman's responsibility, distribution of water by a system of communal standpipes automatically excludes men from water collection. A yard collection, on the other hand, allows men to collect water as well. The strength of a yard connection as an incentive in Tanzania is reflected in the constant requests by rural communities for the permission to have yard connections instead of communal standpipes. The implication of the above observation is that in designing rural water supply schemes which are intended to be managed by the communities aspects of yard connection should be given the necessary attention. In already developed supply systems the possibility of accommodating yard connections should as well be investigated when introducing the community management approach.

Transfering the management responsibilities to beneficiaries may meet with some resistance from government technocrats and bureaucrats who may view the move as a threat to their functions, source of earnings and power. To prevent such a situation from developing government cadres who are involved in operating and maintaining water schemes should be given some incentives which will motivate them to provide the technical, financial and administrative support necessary for the development of an

* 12 policy is free investment costs (ie users don't pay investment costs) for public taps. Yard taps can be allowed if those connecting share the extra investment costs needed for an above-basic service level. Then the last policy is still adhered to. This aspect of our policy is not mentioned here.

efficient and effective community management.

Development and application of appropriate and effective processes and procedures

The Water Policy has introduced the concept of community management without elaborating on how that approach is to be implemented. Experience gained in some water schemes in Tanzania and elsewhere indicates that effective community management can only be achieved if and when effective processes for participation are formulated and institutionalized. It has been observed that development and institutionalization of the procedures of participation gives the "community residents clear understanding of the allocation of obligation and responsibilities between the community and the government, provide users' associations with guidelines for action, and identify the resources needed by the community to maintain the water system" (Jordan and Capul,1988).

Formulation and institutionalization of processes and procedures for community participation has not been fully developed in Tanzania in spite of the fact that community management is the recommended approach. Attempts at developing community management procedures have been made in some regions of Tanzania where water supply activities have been funded by External Support Agencies (ESA). Due to lack of coordination, however, the procedures which have been developed differ from region to region depending on donor choices and preferences. Some difference are superficial as regions differ - all main principles which work should be same and formulated by TT, no diversion. X

Possession of Skills and Resource

As it was pointed out in the preceding paragraphs, operation and maintenance of rural water supply installations has been performed by government personnel. Consequently under this procedure there has not been any felt need of training local communities in the basic skills of running and maintaining the schemes. Furthermore, since the resources necessary for running and maintaining the schemes were supposed to be provided by the government very little effort has been made to develop the skills, knowledge and resources of the local communities for the purpose of operating and maintaining water supply systems. However, if the community management approach, which is being introduced, is to succeed there is need of instituting systematic training programmes for the beneficiaries in the basic skills for operation and maintenance. In addition concerted efforts will have to be made to motivate local comunities to participate in generating resources to support operation and maintenance activities.

Attempts to train village people in basic skills of operation and maintenance have been made in donor assisted project areas only. As is the case with the development of participation procedures discussed above, training of beneficiaries has so far been donor based. Each donor has drawn out a training programme and prepared training materials separately. As a result training programmes being carried out in Tanzania differ from project area to project area.

In regions without project support from donor countries or agencies

training of beneficiaries in operation and maintenance of water supply installations does not exist at all.

Promotion of cooperative and organizational relationships

It has been observed that a spirit of cooperation among communities which share the same water delivery system is essential for an effective community management system to develop and thrive. It is equally important for this spirit of cooperation to exist also between communities and their local governments because some of the rural water supply schemes provide water to communities which fall under different administrative units. In Tanzania, for example, many water schemes supply water to communities which fall under different administrative units. These are generally known as group schemes. The management of such schemes on a community basis is not a simple task as it involves securing consent and cooperation of different groups with at times conflicting interests.

For such supply schemes to be managed by the community requires first creation of acceptable community based organization(s) which would be entrusted with the responsibility and authority to manage the water delivery system. Second it would also require the cooperation of the local authorities concerned in offering support to the managing body and helping in solving resource use conflicts that may arise. The cooperation envisaged would have to be "based on mutual respect, shared decision making, two-way information exchange, negotiations and defined responsibilities"(Rondinelli). No group would in such a setting be expected to dictate to the others on what to do and what not to do.

Application of appropriate technology

The experience gained in Tanzania in managing rural water supplies is that community management has been very difficult to apply mainly for two interrelated reasons. One was the government policy on who is responsible for operation and maintenance. Second was the application of inappropriate technology.

In launching the rural water supply programme in Tanzania politics and to some extent the readily availability of financial resources which prevailed at the time influenced greatly the choice of technology to be used. Very limited efforts were made to develop and promote low cost technologies or to encourage beneficiaries' participation in operation and maintenance. The political leadership which perceived the provision of water to rural communities as a basic service which is supposed to be provided free by the government was not interested in involving the beneficiaries in any aspect of the water supply. Consequently the sector Ministry did not feel any obligation to develop or use technologies which would be within reach of the rural communities especially in terms of operation and maintenance. This type of approach may probably carry the explanation as to why at one stage in the development of rural water supplies it was estimated that about 95% of pumped rural water schemes were powered by high speed Lister diesel engines whose operation and maintenance was known to be beyond the ability of the rural communities. One senior officer, in the Ministry of Water, who was at one time in charge of

operation and maintenance once observed that many water supply schemes in Tanzania are in-operative and are therefore abandoned by the intended users. He attributed this state of affairs to the use of "inappropriate and sophisticated technology options which were neither affordable nor sustainable by both the government and the beneficiaries".

men & women in

It has been observed that an effective community management system can be expected to take place where the communities are offered a variety of technology options from which they can choose. The technological options, besides being able to perform efficiently, should also be affordable by the intended communities. ↳ after clearly understanding all pro's and con's of each choice, &

Establishment of monitoring, feedback and evaluation system(s)

Another important prerequisite for an effective community based management is the development and use of locally based monitoring, evaluation and feedback procedures on operation and maintenance. It is important for these functions to be performed by the local people/communities because they have day to day information on the operating conditions of the water supply installation. Furthermore, because of their dependence on the schemes local people have all the reasons for taking quick remedial measures whenever the system develops some problems.

realize women must take their part, as they are the ones most concerned

5.1.6 Ways to enable communities to understand and identify external support (such as self help funds and regional development funds)

In order to enable communities to understand and identify external support, the following should be done:

- Information on existing external support, such as self help funds and regional development funds, should be disseminated by regional, district, village leaders and change agents/ extension staff so that communities know where to get the necessary support and how to get that support.

- Communities should be assisted by the extension staff in going through the process of looking for/locating support since not many community leaders are aware of the bureaucracy existing in the support agencies. was already done in PMO's pilot project on CP

- Extension staff should prepare guidebooks/directories describing all funding agencies and distribute such documents to the communities. The directories should show the following information: Address of the funding agency, and application forms and the procedures of filling them.

- Enlighten and mobilize communities to form savings and credit and rural savings schemes as a step towards economic independence.

- Establishment of interest group revolving funds.

- Funding/Support agencies can be invited to visit communities for the purpose of elaborating on their support programmes.

This doc is a typical example of documents in which roles of women are described in one separate paragraph, and the whole chapter on CI is written agender-neutral, as if men & women will automatically share information, work and decisions!

- Another important aspect is the auditing of community based projects to ensure their financial health. Many community-based projects have died out due to infrequent auditing. Communities which receive financial support should be accountable to the support agencies. They should submit periodically financial reports to the funders to ensure adherence to proper usage of funds and to curb misuse.

5.1.7 Roles of Community Participation in urban water supply and sanitation

Community participation can play several roles in urban water supply and sanitation. Most of the roles of community participation are educational in order to raise awareness of the communities and achieve attitude change among urban communities regarding health and sanitation habits.

5.1.8 Indicators for Community Involvement in Planning

The current Water Policy requires beneficiaries to participate fully in the planning process of their water schemes/projects. It is therefore necessary to institute a mechanism in the planning process of finding out whether participation of communities takes place as required or not. There are many ways in which participation can be monitored. Here below are a few indicators which can be used to gauge the level of participation during the planning processes.

* Plans should reflect the socio-economic conditions of the communities which are to be served. Socio-economic conditions of communities can only be obtained through base-line studies which would best be conducted by involving the communities in providing the necessary information pertaining to community's water and sanitation needs.

* Closely related to the above indicator is the development of plans which have a bearing on the felt needs of the communities. Felt needs cannot be identified without involving the concerned parties. This can only be done through dialogue with the communities. There are different ways in which the communities' felt needs can be identified, but all these ways have in one way or another have to have the participation of the target groups.

* In case of villages plans in which the communities have participated in their participation have to reflect the communities' seasonal calendar. Plans which conflict with the calendar of the comminity' activities cannot have been prepared with full participation of the beneficiaries.

* Awareness among the community of what the plans intend to achieve and what activities have to accompany the implementation of the plans as well as the distribution of responsibilities among the beneficiaries, government and other support agencies is yet another good indicator of the communities' active involvement in the planning process.

* Existence of a high level of commitment among the community to the implementation, operation and management of the planned project also reflects prior involvement of the concerned groups in the early conception and planning processes. Such committment obviously stems from clear understanding of what the project is all about and this awareness and understanding cannot be gained without participation of some sort.

5.1.9 Areas which require government approval

Although government wants people to participate as much as possible in the development, operation and management of water schemes/projects, yet it is still the responsibility of government to ensure that the water sector is run smoothly. There are therefore certain responsibilities which cannot and should not be delegated to the people or left unattended to but must be executed by government and some of these are the following:

Search for external assistance

Although the Ujamaa policies of this country may have been modified to suit the changing conditions yet the Self-Reliance policy has not been abandoned. The country is still striving to be self sufficient and self reliant in as many field as possible including manpower. In spite of this goal of self sufficiency in manpower it is still clear in government mind that there are certain areas where this country would need external assistance. It is this realization which makes government recruit experts from outside the country. It is imperative however that in order to further the spirit of self reliance and self sufficiency in manpower only those experts who cannot be obtained within the nationals should be recruited from outside. This country should not be turned into a training ground for non nationals who may troop into the country under the guise of being experts. It is therefore the responsibility of government to ensure that experts who are allowed in the country to assist in the development of the water sector are first well qualified. Second there are no nationals who are equally qualified but are not used. Third that these expatriates do not replace an equally qualified national.

Choice of technology to be used

This issue of technology is discussed more thoroughly under the aspects of standardization in this report. Suffice it to say here that it is important for the government to ensure that the technology which is imported and used in the country is appropriate, relevant, affordable and sustainable at village level. Without proper control of technology, the country may find itself draining its already meagure resourses in trying to support a technology which is beyond its means.

Designs

This subject is dealt with under standardization

Acquisition of materials and equipment

Government should exercise some control on especially materials and equipment ordered from outside the country mainly for two reasons. First to ensure that suitable equipment and materials are ordered. Second, to ensure that proper equipment and materials which are available in the country are not ordered from outside the country. In that process the country would save on foreign exchange and at the same time protect and promote local industry as well as giving support to local employment.

5.2 Community Awareness and Capacity Development

5.2.1 Training Needs

Inception and Planning Stage

Available data tend to suggest that during Inception and planning stages of the Project Cycle, the main activity taking place between Agency and Community is information gathering/sharing.

At these two stages, both the Agency and the Community explore conditions and issues which have to be taken into account before the project operates., i.e. data on water use and needs, health and hygiene conditions of the community concerned, etc.

Participatory approach has proved to be successful in facilitating dialogue, discussions and meetings during the process of sharing information at the inception and planning stage.

Implementation Stage.

At this stage, the community is expected to undertake construction tasks hence training is essential. Identification of local skilled people, e.g. means, carpenters together with the training of unavailable required skills in order to fill gaps should be done. Most of the training could be on-the-jobs, those with skills should be encouraged to remain in the community.

Operation and Maintenance.

At this stage, the new water point is fully used, three tasks have to
be performed, i.e.. operation, maintenance and Financial Management.

Operation:

- rules and regulations regarding the use of the water point have to be explained to all users.
- Keeping the water point and arounding areas clean and in good conditions should be enphasized.

Maintenance:

- regular inspection of water point and surrounding area.

- Repairing damage or leakage in order to prevent major failures and more costly repairs.

- Reporting major failures to water Authority. *

Financial Management:

- Making agreement on household contribution to water Fund and method of payment.

- Collection and safe useping of money, and recording incomes and expenditures.

- Make necessary payments for water use and maintenance of water point.

The training would, therefore, base on the three tasks, i.e. operation, maintenance and Financial Management.

5.2.2 Promotion and Exchange Skills at Village Level and 5.2.3 Retention of Skilled People within Communities.

There is linkage between the above two items and hence are discussed
here together. With regards the Promotion and exchange of skills at village level, an indeed, even with retention of skilled people within communities, the social acceptability of a candidates is as important as their technical suitability.

According to some writers, the selection criteria of the candidate has to take into account the following factors:

. Permanent residence in the area

. Other sources of income.

. Mobility and ease of access

. Reliable and respected person

. High personal motivation for the work

. Able and willing to keep records

. Previous technical experience, on clear interest and aptitude during training.

The selection of candidates on basis of this criteria will create a smooth take-off when it comes to the second factor, i.e. Training. When skill gap among selected candidates is indentified, training programmes both on-the job and formal training should be conducted. This has to be accompanied with appropriate time scheduling in order to enable the participants/candidates follow the training activities. Upon completing training programme, candidates should be given certificates and other symbols of performance and appreciation.

* This is far too little. Really ...

Field visits to other schemes, training workshops (on identified issues pertaining to water sector) provision of Newletters in which water related issues are discussed, interviews and Radio Programmes are some of the ways which will assist in promoting and exchange of skill at village level.

But these skills which have been developed need to be retained, this
is possible if the criteria for selection of candidates was followed. It is stressed here that job appreciation and recognition of the skilled workers has more impact and longterm effects than provision of remuneration facilities.

"Remuneration is another important factor for sustained motivation and job appreciation. Remuneration may be in cash or kind from the community or budgetary allocation from government and national organisation. Both present problems. Limited government funds mean that payment is often delayed, and communities are not always able or willing to raise the necessary money."

5.2.5 Ways of Facilitating Communities in Larger schemes (Group Schemes) to Effectively Participate in Management

Promotion of Community-based management will require fulfilment of the following broad conditions:

* Communities concerned with the water project should be involved fully in decision making on all major aspects of the project such as the need for water supply and other improvements, selection of water sources and siting of water supply facilities, the technology to be used and level of service and the local organizational structure needed to manage the project, etc.

* Communities should be responsible for the mobilization of resources

* Communities should bear responsibility for the project

* Communities should have access to external support (public or private) to supplement local management capacity

* Government water department or agency should act only as facilitator and supporter and help to build community self-sufficiency.

Introduction of community-based management of group water schemes in Tanzania will require implementation of the following :

There should be an organization that is responsible for running and managing a water project.

Operation and maintenance of an increasing number of water supply systems strewn over large areas of Tanzania and while at the same time continuing with the construction of new supplies is beyond the financial and manpower abilities of the government of Tanzania. Government will be able to continue with the construction of new

in large group schemes there a public service company - like in commercial profits beyond areas is needed to help scheme running & expanded. Professional management

supplies if the tasks of operation, maintenance and repair are delegated to the communities using the water systems. Delegation of operation and maintenance responsibilities to the beneficiaries will require formation of an organization which will be adapted to cope with the new responsibilities.

It has in the past been tried in this country to entrust the responsibilities of operation, maintenance, administration and financing of recurrent costs of water schemes to local councils. However, past trials with this approach was not very successful. Although the local councils had the necessary authority to collect money from the communities for running the projects yet there were several factors which reduced their effectiveness as managers of water supply schemes. these were:

*Local councils were usually established at levels which were higher than villages or communities and the water supply systems did not always covering all the villages or communities in any given local council juridictional area. Consequently. It was rather difficult for that section of the community that was not served to understand why they should contribute to the running of the water supply system which was not serving them.

* Local councils had other tasks beside water supply which attracted attention and finances

* Because local councils were responsible for other sectors in addition to water supply sector it was possible for funds intended for water to be diverted to other sectors.

Experience obtained from water projects which are managed by the community shows that it is preferable for organizations intended to run water projects to be formed at the users level. This can be at a single village, group of villages or neighbourhood (in case of urban areas) level.

The organization should be composed of and owned by members

When the organization is composed and owned by the users it is possible to take care of the interests of all sections of the community. Furthermore ownership of the project by the users/members enhances willingness of the community in meeting the costs of operation, maintenance and repair. It also makes those who are entrusted with the day to day running of the project accountable to the community that owns the project.

The organization so formed should not be imposed on the communities concerned but should be voluntarily entered into

The tendency of using the existing political or government organization to run water supply projects should be avoided as much as possible. In many cases existing organization (be they political or otherwise) have their set tasks to which they accord higher priority. It would be a disservice to the water sector to impose such organizations to the communities. In many cases people serving in existing organizations would not count themselves accountable to the community in so far as water supply is concerned. Their

allegiance is with their original organizations. It is, therefore, imperative that organizations to run water schemes should be freely formed.

The leadership of such an organization should be drawn from the members of the organization and should be democratically elected

Associations formed need leadership. Experience has shown that management of such organizations works well when members of the executive body of such organizations are drawn from the members through democratic processes. Imposition of leaders from outside the organization will in many cases not work. Outside support should only be in giving advice and assistance to the organizations.

leadership to be periodically accountable to members to know this.

The organization should not have any political affiliation

Now that Tanzania has chosen a multi-party political system, it is important that the organizations to be formed to run the projects should not be based on political overtones. Selection of the executives should be based on individual's merrit and not on his/her political affiliation. By so doing the organizations will extricate themselves from possible political interference and conflicts that may arise because of politics. In other words the existence of water organizations should not be governed by sectarian politics.

The project should be self financing for operation and maintenance by generating sufficient funds mainly through tariffs.

The Tanzania government has already declared that the available public funds are inadequate to meet recurrent costs of running all the water supply schemes in the country. Furthermore, evidence available from this country and from other developing countries shows that demand and willingness to pay for water is strong especially with poor people who are already paying higher rates for water services. There are many ways in which projects can raise the neccessary funds for operation and maintenance. Funds for running the scheme can be raised through any one of the following methods: Voluntary fund-raisings, General community revenue, Community-based revolving funds, Charging flat rates or graded flat rates, Charging for productive use of domestic water, charging for water by using meters, and water vending. Each one of these methods of revenue collection has its strength and weaknesses. Choice of method of revenue collection would depend on the prevailing socio-economic conditions in a given project area. The communities should be free to decide on the method of raising revenue for their water scheme.

The organization should be empowered to set its own water tariff structure and be able to revise it depending on the costs of running the project.

An obligation to meet operation and maintenance costs should be accompanied with the authority of setting tarrifs and collecting revenue. The water department can only assist the local organization in estimating the recurrent costs, in determining a cost-covering and equitable tariff systemr and in how to collect

revenue.

The organization should be able to pass and enforce rules, regulations and by-laws to govern the running and management of the water project

A system of incentives such as yard/house connection should be incorporated in the project.

It has been observed that a higher level of service such as a yard or house connection solicits the willingness of the people to support their water project by paying for water and protecting the system in general. The water department should, therefore, consider allowing people who can meet the cost of having a yard/house connection to do so.

The Management Team should have good working relationship with local government leadership

Although it was pointed out above that water organization should not have political affiliation it does no mean that the organization should not work in harmony with the existing political and government structures. On the contrary, experience has shown that a good working relationship betweent local leadership and water associations is quite essential for successful operation of the water project.

Government should offer Management advise and technical support to such local organizations.

There are cases when local water organization would need assistance. The department responsible for the water sector development should always be ready to assist in such cases. Assistance from a water agency can be given in a form of human resource development. That is, in training local people in the art of managing their water project. The water department can also assist local organization in securing the needed spare parts etc.advise and technical support to such local water organizations.

5.2.6 Appropriate Training for Sector Workers in Community Participation.

In order to have an effective training for sector workers, training

needs Assessment Analysis will have to be conducted. Both the community, the trainees and the trainers have to be involved in the exercise. The learning must, therefore, be perceived to be relevant to the job of trainees and to the needs of the communities.

It is suggested that a series of short training courses, alternated

with practical fieldwork is more appropriate. However, any meaningful training will have to be conducted at regular intervals, in order to build up skills, motivation and the sharing of experience.

Evaluation of training course should also be done, at least at the end of the course, and preferably one or more times during the training, to allow for appropriate adaptation, if necessary. Some aspects to be evaluated, may include, the training content, the method of training, the performance of trainers, the participation of traineer and the general administration of the course.

There is need for proper monitoring and supervision of the trainees after the training. This will assist in assessing the success of training and identification of other training needs.

Another factor, on the side of trainers, which sould be emphasized,

is the use of participatory learning methods. For example the UNDP Project for Promotion of the Roles of women in Water and Environmental Sanitation (PROWWESS) offers good opportunity to apply participatory learning methods.

The contents of the course to be run, will have to base on the tasks
which the sector works in Community Participation are performing. A proper task analysis will be of assistance is designing a proper course.

It is the application of the above information which can make one come out with an appropriate training not only for sector workers in Community Participation but, in fact, any type of training.

5.2.8 Suitable Process of Community Mobilisation Diologue/Information Sharing.

Awareness of the requirements of the community as indicated in Water
Policy document should be made to the communities though the opposite is the case.

Some of the ways to tackle this issue are as indicated below:

* Where appropriate, the dose on water policy should be incorporated in training curriculum particularly when conducting training for water beneficiaries at village/scheme level.

* Campaigns, through Radio and/or Radio programmes should be initiated, insisting on the role of Wananchi to start water supply project without depending on Government or foreign Donor assistance. A similar Campaign by Ministry of Health on "Health for all by year 2000" can serve as an example. In rural areas, the major reliable source of information has always been the Radio.

* The use of postures can also help in providing information on Water Policy cheaply. Postures could be distributed at different meeting places where the community could read and pass the information to others. The use of postures is more effective than arranging a meeting for the villagers to discuss about "Water Policy issues".

* The use of Newletters can also be of assistance in making water policy known to the communities. By putting in the New letter, issues pertaining to water, readers will be able to known, among other issue, the water policy and pass the information to others.

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6. COORDINATION

Text is under preparation

7. OPERATION AND MAINTENANCE

PREAMBLE

The Water Policy (para 35 -39) spells out in broad terms how operation and maintenance of rural water supply projects should be carried out and who should be responsible for what. It is therefore proper to assume that any recommendation on these two issues of operation and maintenance should be guided by the principles outlined in the policy.

The Water Policy gives the following guidelines on operation and maintenance of rural water supplies. It points out that emphasis will be on involving the beneficiaries in construction through self-help approach, in meeting the operation and maintenance costs and in protecting and conserving the projects which are in their areas. The policy, however, observes that there are projects which exceed the abilities of the beneficiaries because of high technology and high costs. projects have been divided into three categories: small projects, medium projects, big projects and National projects.

7.1.1 Conditions and Procedures of Empowering the Beneficiaries to be Responsible for Operation and Maintenance of Water and Sanitation Projects

During the early local government days people were keen to participate in their development projects. Examples can be cited of local authority primary schools, the-so called "chiefs roads", the maintenance of the "chiefs rivers", etc. All these were being done on local initiatives. However, when decentralisation era came the self help aspects collapsed. There were a lot of projects started. But almost all of them collapsed. The measure reason being the expectation on the government to do things. During this era the government would come up with a policy, do the planning and come up with the money for the project. Consequently people expected the government to construct the projects and complete them. Thereafter maintain the said projects. This included water schemes and sanitation programs.

One can kindly recall when cholera came into the country in 1979 in Nachingwea District the Police and people's militia was used to force people to dig pit latrines. Unfortunately because culture prohibited certain groups of people within a family to use the same latrine one often found well dug latrines but not utilised. Another vivid example is the standing instruction that every primary school should have latrines. These latrines are expected to be constructed by the villagers. Since a good number of villagers do not have latrines and some of those who have them they are not the best constructed they find it a bother when they are asked to go and construct primary school latrines. There are similar problems in relation to water schemes. Certain schemes where government was highly responsible for the planning of a pumped water scheme, after construction and installation of water engines and pumps villagers still expect government to provide the fuel and meet maintenance costs. It is not surprising to go into a village and find no water simply because nobody was prepared to pay

for the fuel. They are awaiting the government to bring fuel. In extreme cases the villagers do not even care for the machines. As a result one finds the pumping machine stolen or at least missing and nobody within the village can tell you where it is. Sometimes even the plastic piping are dug out and used to prepare bangles.

Other similar examples would be found in Shinyanga where small dams were being constructed and villagers coming in with their flocks of cattle to drink water right in the dams. In the process dams were being destroyed by cattle. In some other areas in Shinyanga one found shallow wells with small hand pumps not working simply because a screw was missing and the government was being awaited to supply the spare.

All these examples are depicting a situation where planning came from above and people are told to implement. They do not become part and parcel of the project much as it is far their own good. A sense of appreciation lacks on the pot of the villagers. They mis a binding link amongst themselves and lack a binding link between themselves and the project. The property is seen as "Mali ya Serikali" (government property) rather than seeing it as their own project/property. Sometimes it even so happens that particular project is not their priority. For example in some areas of Biharamulo people were willing to participate on water projects rather than primary school buildings. In some parts they were willing to build classrooms but reluctant to build teachers houses. In a very village one goes to in Tanzania Mainland one would find projects which have attracted more attention and participation them others.

In order to abate this situation villagers would feel more comfortable and responsible to do something they have participated in decision making. In this respect then there is a need to involve villagers fully in the decision making process in all aspects of water and sanitation activities. This means involving the villagers in the planning cycle ranging from problem identification, identification of possible solutions, identification of the courses of action, indenting as to who will do what in the project as well as the financial implications to both villagers, Local government, Central government and donor agencies if any. Get the people to appreciate integrated water supply and sanitation projects.

In this process the villagers have to be sensitised into operation and maintenance activities. They have to participate in Construction. This will enable the transfer of technology to them on their projects. While so doing they (villagers) should appoint their own technicians who will not only be trained on site but could be given more short training at a technical school or Department Headquarters. But one has to be very careful to select not only man and women but those that are likely to stay in their villager throughout. For example taking young men and girls who are yet to get & married they might move out of the village to look for green pastures elsewhere.

One has to ensure that the village government, village water committee, health committee and a group scheme committee are in

place and active. They should be visited by both ward and District leadership at regular intervals. This will create a sense of responsibility in these committees. To be visited by higher level authorities will motivate these committee into meeting and deliberating on the process of the two projects namely water and sanitation.

It should be mandatory for every for every committee meeting to send minutes of their deliberations to the ward or district authorities as the care may be equally true when these minutes are sent receiving them should build a culture of reading them and sending back comments. Even if the minutes have nothing to comment about or worthy taking action, a note appreciating having seen the minutes and encouraging these committees to keep it up might be a source of encouragement. It therefore follows that there be somebody assigned at the district level to read these minutes and comment.

On the political side at the level of the Council there must be a deliberate policy stating not become easy for the population at large to associate sanitation and disease. The women who in most cases care for the children, it does not ring for them to connect sanitation and diarrhea, dysentery, worms and other related diseases. It is therefore suggested that whatever villagers indicate a need for an improvement on a water scheme before assistance is given it must be tied to sanitation.

Another condition which should go together with the above is financial implications. The village/ward should start with a village/ward scheme Fund before embarking on actual physical implementation. The amount of contribution can partly determine the amount of commitment of the people into the project.

Under sanitation particularly in relation to construction of latrines one has to consider the question of culture. V.I.P. latrines in Soliway Njombe are a vivid example. While some of them were acceptable others were not acceptable due to cultural environment.

Construction materials is another area to be studied properly from place to place. In certain areas one might need to transport constructor materials to a ward or a village or even a "Kitongoji".

It is also recommended that working tools be provided to communities at least initially. Things like special spanners, crowbars, special hammers and the like be available at village level. More specialised tools could be stored at the ward level and borrowed at a small fee when needed in a particular village.

To sum it up all training, involving people in problem identification, planning and implementation as well as giving a sense of belonging to somebody will improve greatly the beneficiaries to be responsible for 0 & M of water and sanitation projects.

7.1.2 Suggestions on ways of sensitising the Community to Conserve and Use Available Water Economically

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This subject has to be divided into two as follows:

(a) Urban water supply
(b) Rural water supply

A: URBAN WATER SUPPLY

In urban areas major sources of water supply come from schemes based in rural areas. Dar es Salaam gets most of its water supply from Ruvu located in the Coast Region. Dodoma Rural District. Morogoro gets its supply from a dam which collects water from Morogoro Rural District. In fewer instances water for the urban population comes from wells within the urban boundaries for example, Mwanza, Lindi, Nachingwea and Mtwara. Occasionally private buildings construct their reservoirs to collect water from rain. On the whole water supply in urban areas "ni maji ya bomba". It is monthly metered water. Therefore, putting a price-tag on the water is one way of getting the users to appreciate the values of water. It binds some people to use water economically.

In the urban areas there has been a tendency on the part of Government to be over sympathetic with the "common man". Consequently public water kiosks are made available to draw water free. One notes that water is left running in these kiosks. Children are left to play with water as and how they want. At some points like on Bagamoyo Road people are using this free water to water their "mchicha", tomatoes and other kinds of vegetables. These are economic ventures. Yet they are using this water for economic ventures which are highly profitable for free. In some areas this free water from public kiosks is used for washing vehicles like the one that can be seen along Morocco Road. Yet, there is a very high charge for washing these vehicles on free water.

In situations such as those mentioned above, one way of sensitising the community to conserve water is to make sure there is no single water point in urban areas offering water free. An economical charge should be put in place. During Colonial Tanganyika and a few years after independence one remembers several water kiosks which were collecting money for every tin of water drawn. During that time people were very careful with the way they used water. After all, why should there be people in urban areas who do not pay for this water while in villages communities are paying for spare parts for water schemes. In open areas where there is a need to maintain the green environment such as Mnazi Mmoja in Dar es Salaam, the City Council should pay for the water on metered basis. The big bill will strike them to stop unnecessary watering where a particular point is left open a whole night in the pretext of watering grass which needs just half on hours' watering.

On the other hand there is time when it rains. All the water is left to fall and flow away free. Half an hour after it has rained one goes into a hotel or a home and finds no water for even the wash-rooms. Though this is difficult to comprehend yet it is true. It is suggested that every building put up in urban areas should have a big reservoir for rain harvest. It is therefore recommended that staff in the Ministry of Lands, and Urban Development be

sensitised into appreciating water conservation. Thereafter it be a deliberate policy on the part of Government that any building put up in urban areas should have rain-water harvest reservoirs proportional to the size of the building and intended use. For example a hotel should have more reservoirs than an Office. This policy in a way will go further into sensitizing the urban dwellers into water conservation.

The above suggestions have considered at the use end. Certain steps have to be taken to care for the sources of supply of water to urban areas. Where there in only one known source efforts should be made to preserve this source. In order to preserve the source it is suggested that part of the money collection on water rent from urban water users be spent on planting and preserving the environment at the water source.

Also a distance of not less than half a Kilometer radius from the water source be protected by law. Therefore that area should be planted with trees, no fires should be seen there. Therefore construction of fire lines be put in place. The source of funds being the urban user.

B: RURAL WATER SUPPLY

Communities in rural areas get their water supplies from rivers, (directly) or pumped/gravity schemes, various types of dams, boreholes, shallow wells rain water harvesting reservoirs, lakes, the oceans and son on. There are very few individuals in rural areas who have water within their houses. Most communities fetch water from distant point. For example, the communities in Shinyanga District have to fetch water some twenty kilometers during certain period of the year. They have to use bicycles to fetch this water. Some people, particularly women have to leave their homes as early as 0400 hours in the morning on bicycles to fetch water only to return at 0900 hours. In some other places women have to go down hill a kilometer away and come back on steep hills with bucket of water. In other areas, some of them travel uphill and come back with water full of dirt due to human and animal activities uphill. One could sum it by saying that most rural communities do acknowledge that water for domestic use is a problem in one form or the other.
Despite domestic water supply, there is water for livestock. This is more so of a problem for livestock farms - coincidentally areas with many livestock are the same areas which are driest during certain periods of the year. In other areas there is irrigation for major crops such as rice and other areas cultivate in large quantities vegetable such as tomatoes, onions etc. Some grow these crops for domestic use and others grow them as commercial undertakings. All these groups are experiencing the problem of water scarcity in one form or the other.

Having acknowledge the acute presence of inadequate water supply one is tempted to think that these people are insensitive to their problem. There is a tendency to blame them for not conserving the available water economically. In the first place it is not necessarily true that all these people are insensitive. Most of them are quite sensitive. That is why in some areas where water

schemes have been started villagers are willing to contribute for the care of their water schemes. Picking on one District, it can be exemplified by the amount of contributions for the six village water scheme in Iringa District as of 1993.

From the above table one notes that in some villages people are highly sensitive to water availability, for example Image with a contribution of Sh.266,400/= Isupilo Sh.109,483/= and Malizanga Sh.135,000/=. Under the same water schemes there are villages which seem to have least contributions to their water schemes such as Ibangamoyo Sh.1,020/=, Kitumbuka Sh.4,860/= and Mbigili Sh.4,700/= partly an indication of low interest for various reasons. Both these extremes can be found in any part of Tanzania.

As a matter of policy, government has already directed every village to have a water Management Committee within a village. All that is necessary is to enforce this Government directive.

For those villages which have a single water scheme which is adequate for their needs and who are already highly sensitised to their water one needs two major things:

(i) Enable a village to prepare a by-law to handle whoever is caught misusing the water. The punishment has to be inflicted on him within the community - such as a fine, planting of trees, guarding the source of water for a number of days, or paying a fine which would go into a village water scheme fund.

(ii) Village seminars have to be conducted to instil education on how the community could conserve and use water economically. These seminars should combine environmentalists, water engineers/technicians and community development workers.

All in all general community sensitisation should be done by training village government leaders, village water committees, village health committees, Groups Scheme committees, and villagers about the relationship between water and human activities. Their training should include causes, signs, symptoms, and preventive measure of water born diseases like cholera, diarrhoea, dysentery, typhoid and all other kinds of worms and diseases. The training should include water source protection and use of water economically.

History has it that in Kagera Region people were made to fear catchment areas simply because those areas had myths behind them. Tales of abnormal snakes, special gods and the like were being told by elders. This scared people from tempering with catchment areas. However, with the abandonment of such beliefs people are now cultivating or destroying water catchment areas became of lack of fear. It is therefore suggested that hard and fast by-laws which can be tried at village, ward and primary court levels be put in place. All villages with catchment areas must have these by-laws and be allowed to enforce them. These by-laws should cover those who are caught misusing water such that the ecology of an area is being affected.

Indicators of water use must be collected at the village level and

once a month the data can be collected at ward level which will in turn send the same to the District once in three months for analysis purpose. The analysis should be sent back to the village for education purposes so that villagers can be made to appreciate the collection of the said data.

Every primary school syllabus should include a subject on water conservation and usage of available water economically. Of course this will include not only hygiene but environmental issues.

A law should be put in place binding a very public institution such as schools, community centres, churches etc. to have rain water reservoirs. It should also be encourage that private house, should have sizable rain water reservoirs for domestic use. In order to enable many people to have these reservoirs it is suggested that at the beginning, a subsidy be established for the purchase of construction materials and equipment for these tanks/wells.

A wide part of Tanzania has at least two rainy seasons. These is no part of Tanzania without rain at all. Therefore it is suggested that the Government should make a deliberate policy to train several technicians per ward who would go around villages constructing various types of rain water reservoirs. So long as a family has a house it must have a reservoir.

A certain amount of competition between one community and another or village to village in a ward or individuals within a village be established. A village which has planted more trees in a catchment area should be awarded. A village which has protected its catchment from cultivation, fires, and any other human activity for a year could be availed half the materials for construction of rain water reservoir. A community whose 75% of its houses have constructed reservoir could be given a culvert for their road or 3 film shows on development activities. The chairman or village water committee could be sponsored on a tour to another district which is doing well in another region. A village which has contributed highly to a water group scheme fund could get certain privileges such as having their dispensary improved by Government/District Council.

It is also suggested that a rural dispensary or health centre be the fulcrum of training in water conservation. Villagers once a month in a baraza could be called to look into a microscope and see what type of impurities are found in their water, the type of worms found in people who have taken unsafe water and so on.

7.1.3 Required Arrangements at District Level to Enhance O & M at Village Level

According to Act No.10 of 1992 (An Act to establish the Local Government Service Commission......") Section 21 and Section 31 local authorities are empowered to establish such number of departments and establishment as they deem it fit subject to the approval of the Minister responsible for local government. It was within this content that the Minister in 1991 approved the following Department for all local authorities:-

1. Finance Department
2. Administration and Manpower Department
3. Community Development Department
4. Trade and Economic Affairs Department
5. Works Department
6. Water Department
7. Health and Social Welfare Department
8. Education and Culture Department
9. Lands, Natural Resources and Environment Department.
10. Agriculture, Livestock and Cooperatives Department,

Divisions of Law and Order, and Audit.

Then Section 22 and 32 of Act No.10 established the position of the chief executive of a local authority. On the political side we have the councilors. According to Section 74 of Act No.7 of 1982 which established District Authorities the council has six (6) standing committees as follows:

1. Standing committee for finance & planning
2. " " " administration and establishment.
3. " " " Social services
4. " " " educational affairs
5. " " " economic affairs
6. " " " Human Deployment

Section 42 of Act No.8 of 1982 or urban authorities established 7 standing committees as follows:-

1. Standing Committee for finance & administration
2. " " " urban planning
3. " " " public health
4. " " " education and culture
5. " " " works
6. " trade and economic affairs

7. " " " Human Deployment

Each department mentioned earlier falls within one of the council's standing committees. Presently the Water Department falls under the Social Services Committee. Also the Community Development Department falls under the same committee. But the planning Department falls under the economic Affairs Committee. Consequently, one finds that the Coordinator of the Health sanitation and Water Programmes in some places is done by the Planning Officer. Since the Planning Officer is responsible for all other projects in the District and he reports to a different committee, the project suffers from inadequate attention by the planning office. It is therefore recommended that the coordination be done by the Community Development Department.

Secondly these water projects suffer from lack of prompt attention when something goes wrong with the scheme. This is because of inadequate technicians at the water department. It is therefore suggested that the Kikosi cha Ufundi at the Community Development be taught how to repair these schemes. This will increase the number of technicians available for prompt attention on the schemes.

Another area to look at is the problem of spares. Sometimes it becomes very expensive for Scheme Fund to send a village technician to town to purchase a small spare part such as a water tap. It is therefore suggested that there be two types of stores. There should be a big store at the District level based at the Water Engineers Department. This store will keep all sorts of spares on a revolving fund basis. But at the level of a ward there should be a very small store for fast moving items. This store should be run by the Community Development Department at the Ward level since in each ward there is or supposed to be a Community Development Assistant. The villagers should purchase these fast moving items from there.

In order to avoid being cheated, a lists of spares with prices should be sent to all villages with water schemes. Another list be put on the notice board at the ward. This will make it easy for villagers to get their spares quite easily. At the same time villagers will not be cheated by whoever goes to buy the spares by inflating prices. However freedom of where to buy the spares should be left to the village water committee to decide namely from these stores or private shops.

We talk of nothing for free. The scheme technician at the village level should be paid a small fee for every repair he/she/ conducts. This money should come from the Scheme Fund. Both men and women should be involved in maintenance of their scheme.

Earlier on it has been suggested that coordination of the Health,

Water and sanitation be done by the Community Development Department. If this idea is accepted then the District Executive Director or the town director as the case may be should give support to the department. The department will need logistical support. This entails giving the department adequate funds for supervision. They should have transport at the department exposure. Allowances should have be paid to motivate the workers. This money should be put in the local component of a budget if the project is foreign then the question of allowances should be considered right from the beginning.

The Community Development Department should have a Monitoring Unit. Where possible they should have even a computer to facilitate the handling of data received from the wards. The Department be made responsible for the technical advise to the villagers. Where major repairs of schemes are required then they should call upon Maji to go and do the job at a small fee on the scheme. This will keep the villagers aware that the schemes are their own. This will in a way slowly remove the feelings from villagers of thinking that when the repair is big then it is not their responsibility.

Twice in a year all village water schemes must be visited by the department at the District level to check on the working of the scheme regardless of whether there are complaints or not. This means there must be adequate staff at the District level to meet this demand. Adequate staff should be a function of the number of schemes within the District. This technical "eye" should be passed onto the Community Development Assistant at the ward level who will alert both the District and the village in case one notices something not going right.

Their findings should be brought to the District Management Team thereafter reporting to the committee for Social Affairs in the Council. Any deliberations should be communicated back to the Village Water Committee for both information and further action if need be.

Other areas which need to be looked at are those districts which are receiving donor funds for implementing water projects, such as DANIDA. There is a tendency now and again to run a parallel administration with the water or Community Development Department particularly so with funds. One would find that for example a community Development Assistant going directly to the project and being paid allowances without even the Head of Department for Community Development knowing. This tends to create duel royalty which is dangerous to the project particularly when the external support is withdrawn. It is therefore suggested that financial and other administrative actions be conducted through the Head of the Department Responsible in this case Community Development Department.

8. STANDARDISATION

8.3 DESIGN STANDARDIZATION

OVERVIEW

Standardization has been stressed and applied worldwide to ease trade and simplify implementation of engineering projects. Water Supply, in its broad aspect, involves studies, designs, and implementation of physical project elements like intakes, reservoirs, dams, pipelines boreholes, motors, pumps, etc including training of manpower.

Like other engineering undertakings, water supply related components as manufactured in industries are mostly standardized. Setting of standard formats and formula for preparation of design calculations and presentation of engineering drawings has also been practiced, as well as maintaining standard syllabi for training of engineering personnel.

The Ministry of Water,Energy and Minerals,in its efforts to implement water projects, has been preparing and keeping type design drawings and insisted on standardization of water related manufactured components.

Standardization of Information is another area where the Ministry shall have to dwell upon. The Ministry, as overseer of all water related activities in the country, has to keep a convenient system of information exchange, for self informing, upkeep and dissemination.

8.3.1 EXISTING AREAS AND LEVEL OF STANDARDIZATION

(i) DESIGN MANUALS

The Ministry of Water Energy and Minerals,formulated a draft design manual in 1982, comprised of five chapters, namely:

- Planning
- Water Sources
- Water Quality
- Treatment of water
- Design of Piped Water Supply System

The draft design manual, is aimed at giving guidelines to practicing engineers as well as setting minimum requirements regarding engineering practice and social needs.

(ii) STANDARD DESIGN DRAWINGS

The Ministry maintains several standard design drawings, some of them dating back to late 1950's. They are mainly comprised of different sizes and types of water tanks, intakes, dams, weirs, well rings, pump houses, cattle troughs, attendant quarters etc.

The existing level of standardization enables implementation of rural water projects without need of highly qualified personnel to

carry out design calculations and drawings. For example the standard tanks ranging from 5,000 gal to 750,000 gal will meet the requirements of many rural schemes storage needs. Similarly, boreholes pump houses, attendants quarter, intakes etc.

8.3.2 SUITABLE DESIGNS FOR STANDARDIZATION

The type drawings, kept as standard designs, are meant to serve as project components, mainly for small to medium size projects. The fact is that Engineering is always changing, and ideally, each project would be having its unique characteristics, requiring a proper analysis of technical, environmental, social, economical and other aspects. Construction materials are always changing.

Big projects are normally studied and designed by teams of experts, whereas small ones are done in the districts or regions, by engineers or technicians without good experiences especially in studies and designs. This is where the type designs are targeted.

The type design drawings kept by the Ministry are old and others outdated by events. For example, most of these were done in the colonial and the early years of 1960's, when British Units of measurements were in use. These drawings need updating.

Information Exchange

Preparation of Water Supply related studies have common features which could be presented in a standard format. Such formats, simplifies the report writing work, and also reading of the reports. Example of such studies for district headquarters' water supply projects.These studies are normally carried out by Regional Water Engineer's offices, under the supervision of the Ministry. Such guideline formats will be very useful, which will lead to the use of computer aided designs.

In this age of the Ministry's adaptation of computers, standardization of reporting formats could also lead to establishment of software for various purposes. These includes preparation of Regional monthly or quarterly reports, projects progress reports, annual budget and forecasts.

Data processing,storage and retrieval in the Ministry should also be standardized. At the moment there are various methods of data storage, utilizing PC's with different types of software. The Ministry should also standardize software, for easier utilization and dissemination of information.

There are various types of PC's and associated hardware in use in the Ministry at the Moment. Standardization of these should also be considered.

9. SANITATION

9.1 Standards and Targets

9.1.1 Sanitation Components

Excreta

The importance of proper excreta disposal is well known to need much elaboration. It is common knowledge that a large number of diseases are spread directly through man's contact with human excrement, and indirectly via water, food and soil, or via carriers and vectors like flies, cockroaches and mosquitoes. Consequently campaigns which are directed at achieving proper disposal of human excreta aim at eradicating diseases which are somehow caused by poor sanitation.

There are different ways in which human excreta can be disposed. Some methods of excreta disposal are more suitable than others. However, broadly speaking excreta disposal methods can be grouped into two broad categories. One category consists of processes where human faeces is transported away either for treatment or disposal. The second category comprises practices where excreta is deposited on site. Excreta can be transported for disposal by using the medium of water or without using water. Similarly disposal of excreta on site can be done by using water or without water as a medium.

Introduction of an element of water in the process of excreta disposal
produces the following four main alternatives of dealing with this problem:

(a) Transportation of excreta using water

- Flash toilet connected to sewer
- Aqua privy connected to sewer

(b) Transportation of excreta without using water

- bucket latrine
- long drop latrine

(c) Disposition of excreta on site using water

- Flush toilet connected to Septic tank
- Aqua privy
- Cess pool
- Biogas tank

(d) Disposition of excreta on site without using water

- Pit latrine

- Compost latrine

Alternatives (a), (c), and (d) above are used in excreta disposal in different parts of Tanzania with certain alternatives being more prevalent in some areas than in others.

The survey conducted in the early 1980's to determine the level of Sanitation in nine Urban Councils in the country revealed that 80% of the urban population depend on pit latrines as their excreta disposal facility while 10% are using septic tanks, 5% are connected to sewerage system and 5% have no sanitation facility of any kind. 90% of the rural population use pit latrines and the rest 10% have none.

Alternative (a): Transportation of Excreta using Water

Flush Toilet Connected to Sewer

In Tanzania this system is used in areas with a central sewer system. It is to be found mainly in a few urban centers. Towns with the sewer system in Tanzania are: Dar es Salaam, Mwanza, ... It is unfortunate to note that even in these cities , municipalities and towns with central sewer system, not all the areas are connected to the system. As a matter of fact only small areas of these urban centres are connected to the sewer systems. As a result some areas of these urban centres have to use other alternatives of excreta disposal such as pit latrines.

The limited use of this alternative has been attributed to the costs involved. It has been estimated that up to 80% of the total cost of flush toilet systems which are connected to central sewer goes to the collection network. This explains why even in cities like Dar es Salaam which have had a central sewage established for a long time no expansion of the system has been done to cater for newly settled areas.

Alternative (c): Disposal on Site Using Water

Flush Toilet Connected to Septic Tank

This system is widely used in Tanzania, at least by the more wealthy part of the population and where water reticulation is available. With this alternative transportation is required only for sludge removal.

Although this system of flush toilets with septic tanks is widely used especially in the urban centres of Tanzania yet the failure rate is very high because of two main factors. First, many systems are often installed where soil conditions are unsuitable for absorption of the effluent and sometimes the workmanship is of very poor quality. Second, collection and transportation of sludge is done haphazardly. This system of excreta disposal is used by many urban dwellers of this country without considering its appropriateness and efficiency in a given area. In most urban areas of Tanzania efficient emptying of septic tanks is complicated or made impossible because house-to-house roads and paths are not

accessible by motor vehicles. This problem has been compounded by the haphazard construction of houses in both planned and unplanned areas which is going on unabated, with the connivance of the city/municipal leaders, in all urban centres of Tanzania. Even in those areas where collection vehicles can have access to septic tanks the authorities are not able to provide efficient services. In Dar es Salaam, for example, there are very few houses which can get their septic tanks emptied. City council has very few trucks for the job. The recent count has shown that there are only ... trucks in working condition which are expected to service ...units in an area covering ...square km. Corruption by the people entrusted with the responsibility of sludge collection is another obstacle. Very few households would get services of the city emptying truck without paying much more than is officially stipulated for such services.

The end result of all this mess is the overflowing of many septic tanks in many parts of our towns and municipalities.

Alternative (d): Disposal on Site without Water

Pit Latrine

The pit latrine is used widely in many parts of Tanzania. In its simplest form it consists of a large hand-dug hole in the ground covered with a squatting slab made of wood and soil. However, the quality of pit latrines varies from place to place and from household to household depending on building materials available in a given place and the socio-economic conditions of the concerned group.

The majority of latrines in Tanzania are simple holes dug in the ground without lining. However, they all have some type of a wall. Some studies which have been made on latrines in Tanzania have shown that walls for latrines are made of any of one of the following materials: mud and poles, straws, reeds, bricks (mud, concrete, baked), cloth/gunny bags, old kerosene tins and cardboards. The squatting plate for many latrines in the rural areas is made of soil on poles. The squatting plate for many of the latrines in the urban areas is of sand and cement but squatting plate of soil on poles are also found in urban areas especially in the low income cum squatter areas.

The study conducted on sanitation in some peri-urban areas of Dar es Salaam shows that over ninety percent of the sample households use pit latrines and that 78% of the latrines have no roof while only about 50% of the latrines have doors. The situation is not much different from other urban squatter areas in Tanzania.

Probably due to the Mtu Ni Afya campaigns of the early 1970s the claimed usage of latrines is high and ranges from 85% to 90% in the rural areas and is close to 100% in urban areas.

In spite of the fact that pit latrines are used widely in Tanzania it does not mean that the level of sanitation is equally high. The efficiency of the latrine depends partly on the soil and groundwater conditions of the area in question.Pit latrines require

soils which are deep, stable and permeable. Pit latrines should be developed where ground water table is lower than the depth of the pit. These conditions are unfortunately not always fulfilled in all the areas where this system of excreta disposal is used. Many pit latrines are known to collapse either because of unstable soils on which they are built or because of high water table. It has also been noted that pit latrines with heavy accumulation of liquid matter act as breeding grounds of mosquitoes and flies. The soil on the squatting plate becomes a hatching haven for hookworms. It has further been observed that over 80% of pit latrines are substandard and therefore contribute to the transmission of faecal related diseases.

The average lifetime of the latrine in the rural areas of Tanzania varies from place to place because of the controlling factors of soil condition and ground water occurrence mentioned above. The average lifetime of latrines in Iringa region was found to be 3.8 years while it was 3.4 years and 4.8 years for Mbeya and Ruvuma regions respectively. Reasons which are given for such a short life time are the collapse of the squatting plate and the filling up of the latrines.

Because of the relatively easy availability of land in rural areas, when a latrine fills up or the squatting plate collapses a new pit is usually dug somewhere else. This is not usually the case in urban areas where the available space per housing unit is limited. Instead of building a new latrine, the existing one is normally emptied of its contents. However, due to the nature of the latrines and inaccessibility it is usually not possible to empty them by using emptying tankers. The task is done manually (unfortunately without any adequate protective gear) thereby exposing those who do it to serious health hazards.

Ventilated Improved Pit (VIP) Latrine

In order to remedy the deficiencies of the traditional pit latrines an improved variety of pit latrine has been introduced both in rural as well as urban areas. Wanging'ombe division in Iringa region was one of the early pioneer areas where the improved type of latrine was introduced on a large scale. In urban areas the VIP latrines were introduced in some wards of Dar es Salaam which are not connected to the sewer system. The adoption rate of this alternative has been below expectations mainly because of the costs involved. At present the cost of a Ventilated Improved Pit latrine ranges between Tsh. 75,000/- and 90,000/-, an amount which is beyond the reach of many households. There is a need for the Government to facilitate researchers to come up with different designs of standard sanitation facilities to cut across demands for customers of all income levels. Responsible authorities should as well encourage individuals to upgrade substandard sanitation facilities.

Observations on excreta disposal practices in Tanzania

- There is very limited use of sewer system as a means of excreta disposal
- The VIP system of excreta disposal is good but expensive. Its

present cost is beyond the financial abilities of the majority of households especially in rural areas

- Pit latrines are the simplest of all on-site disposal systems. Quality of these pit latrines vary greatly. There is a need of improving on traditional pit latrines.

Suggestions

. The Government should review and enforce the present by-laws which require every household to possess and use properly standard sanitation facility.

. Commercial Public Latrines should be introduced.

. Community artisans should be trained to construction sanitation facilities.

Solid Waste

In Tanzania solid waste disposal is an urban rather than a rural problem.
Consequently this section will be devoted to the management of solid waste in the urban centres of Tanzania.

Reliable information on the generation and characteristics of the wastes produced in Tanzania is limited. Furthermore the limited data available on solid waste is incomplete and in some cases unreliable. This information constraint makes the planning of an efficient waste management in the urban areas of this country a very difficult task.

It is disturbing to note that in spite of the recognition that a thorough understanding of the generation and composition/characteristics of wastes is a prior prerequisite for making rational decisions on how to handle the urban waste, yet collection of vital information is usually disregarded by the authorities and decisions are made basing on shoddy information. This poor approach is reflected in different Master Plans for urban areas in Tanzania.

It has been observed that no concerted efforts are being made to understand the generation and the characteristics of solid wastes in the different urban areas of this country. Instead information gathered in one urban area is assumed to reflect similar conditions in urban centres throughout the country and is therefore used indiscriminately to plan for the waste management in all urban areas. Just to cite an example, for the Dar es Salaam Master Plan of 1979 it was assumed that 0.33 kg of waste would be produced per person per day in low-and medium-density urban areas, and only 0.17 kg per person per day in high-density areas. These data were based on the estimated serviced areas and interviews with officials on frequencies of collection and loads taken to the disposal site in Dar es Salaam city. These data which were applicable to Dar es Salaam at that time have been adopted directly by other urban Master Plans for solid waste management without questioning whether they are relevant to other towns and cities in the country given

the changing socio-economic conditions the country is experiencing.

On-site Storage

Heaps of garbage, trash and huge assortments of refuse are a common spectacle in the streets of all urban centres in Tanzania. This state of affairs has been brought about by both lack of on-site storage facilities, such as dustbins at house premises and inefficient waste collection practices. By law, however, residents of any premises are supposed to be provided with waste storage bins by the house owners. Unfortunately this law has been ignored for a long time by the landlords partly because of limited funds and partly because government has also failed to provide such facilities to residents occupying government owned premises. It has been difficult for health officers to enforce the law when government itself is failing to abide by its own laws.

The problems of on-site storage in our urban areas have been compounded by: shortage of dust bins, or if they are made available, frequent overfilling; dumping of waste on open space accessible to birds, dogs, and other animals such as goats and cows which are now being "grazed" in the urban streets as normal practice; and lack of regular and systematic emptying of bins.

Collection and Transport of Waste

The system of solid waste collection, transportation and disposal in urban Tanzania has been deteriorating year after year. It has been pointed out that in Tanzania urban areas "the collection and transport of waste is done haphazardly with no attempt to minimize costs, and the vehicles are chosen without considering their appropriateness and efficiency" (Yhdego, 1988). The problem of waste collection is further complicated by lack of accessibility. In many peri-urban and squatter areas of our urban centres house-to-house roads and paths are not accessible by motor vehicles.

Suggestions:

In order to comply with UN's declaration of health for all by the year 2002, Tanzania government should:

* ensure that there is proper collection and disposal of solid wastes

* mobilise resources so that by the year 2002, all Urban Councils will have a well located, designed, operated and maintained land fills. The councils should be provided with (or secure) enough trucks for solid waste collection.

* encouraged Individual households to adopt the habit of using dust bins for solid waste collection to avoid littering.

* encourage recycling.

* involve NGOs and create conducive environment for the private sector to be involved in the collection and disposal of solid

wastes.

* educate the people on the hazards of haphazard disposal of wastes.

* should prohibit haphazard disposal of industrial wastes

Sullage:

Survey conducted by Dahi and Thogersen in 1993 revealed that per capita water consumption in Urban Councils (Dar es Salaam case study) is between 22-85 liters per capita/day. Taking the high Urban population growth rate and the fact that 80% of water consumed is reproduced as waste water. It means that per capital daily urban waste water production ranges between 18-68 liters per capita/day.

The survey also revealed that only 10% of the waste water in Dar es Salaam, which is the best served Urban Council in the country, is disposed into pits while 90% is haphazardly disposed thus threatening communities' health and environment. In rural areas there is no problem of sullage.

Health for all by the year 2002 will never be achieved if sullage disposal services are left at the current level.

To improve this situation, it is suggested that small borehole sewers should be constructed in planned areas. Soakaway pits leading to vegetable gardens are recommended for squatter areas.

Storm water:

Storm water drainage service in Urban Tanzania is very low. Mainly this service is provided in town centres. Flooding in the peripheries is a common phenomenon and therefore creating good breading sites for mosquitoes.

For areas served by water-borne systems, frequent blockage due to poor maintenance of the system has resulted to flooding along the streets causing nuisance to road users.

Suggestions:

To contribute to the Health for all by 2002, it is recommended that:

* the Government should mobilise capital and human resources to ensure that all urban councils have proper storm water drainage systems by rehabilitating old ones and constructing new ones.

* After construction of the sewers and rehabilitation of the old ones; a proper operation and maintenance manual should be prepared to ensure proper operation and maintenance to avoid future blocking of the systems.

* The community should be educated on the consequences of haphazard throwing solid waste in drains.

* Planners, engineers and designers should stick to proper road designs, standards and other requirements.

9.1.3 Data collection and update data on current coverage

The national environmental sanitation activities have been handled by a number of Governmental ministries department/parastatals, ESAS and NGOs. The Ministries involved include those of Health, Water Energy and Minerals, Local Government (including city council and other urban councils), Tourism Natural Resources and Environment, Community Development Women Affairs and Children.

The general trend has been lack of coordination. Consequently each is working independently hence duplication of effort on the same subject and scattered information.

Existing system of data collection

There has been no proper system on data collection. As mentioned above, each involved body has been working independently on data collection. Data collection todate is done for specific purpose, time and users. The existing system does not have a recognised central data bank from which information can easily be obtained at the needed time. There is lack of trained manpower on data collection, analysis and storage. In addition to that there is insufficient working tools, transport and funds to enable staff to collect data in remote areas. Moreover most of the data available are outdated and unreliable.

Updating data to meet current coverage

In order to have updated and realistic data the following have to be done:

- In the first instance a strong coordinating unit should be established among the involved bodies.

- A comprehensive data collection and information system has to be developed. Data bank management to be put in place. Modern technology for data storage should be utilized such as microfilms, computer diskettes, or any other proper preservation.

- The established data base should be continually developed/built up and updated through;

(i) Obtaining new data from research results

(ii) Collecting up-to-date data from site visits e.g. regions etc.

(iii) Training on data collection, analysis and management at all levels.

(iv) Getting new data through exchange programmes with other institutions outside the country.

(v) All involved bodies should send the current data to central information bank.

Data use:

Users can obtain the data by visiting the central information/data bank where they can either use library materials available or retrieve the data from the storage facilities such as computers.

Data can be used as a measure to monitor/evaluate implementation of the planned sanitation activities. They can also be used to determine the location and degree of neglected areas in terms of spatial coverage.

9.4 Promotion

9.4.1 Review existing promotion initiatives:

Several initiatives have been taken to promote sanitation as well as water supply in rural areas and urban centres. These include the following:

(a) Meetings:

In order to disseminate information on sanitation, meetings have been conducted at different levels from ten cell units to national level. These meetings have been organise by government officials from the concerned ministries, NGO's and donors. Any meeting organised has specific objectives for a specific target group. It can be a meeting of how to involve the community in planning, implementation monitoring and evaluation of sanitation project or programme. As a result of these meetings, the communities have organised themselves to tackle sanitation issues. Formation of water and sanitation committees in villages and at ward level in urban areas is the result of this promotional approach.

(b) House to house visits:

To have a proper understanding of the existing sanitation situation at household level, regular household visits are done. These visits give the promoters the opportunity to interact and talk to the household owners particularly women who are the main actors in household sanitation. Through these discussions the promoter pass on sanitation messages to the community.

(c) Seminar and workshops:

Different seminars and workshops are organised with specific objectives on sanitation issues for different target groups at all levels, from community to national.

(d) Films and video show

Films and video show on the subject matter of sanitation are organised. However this method has it's limitations. Films and video cassettes on sanitation are not widely available on the market and when they are available on the market they are expensive.

Leaflets, Booklets and Posters:

Several leaflets, booklets and posters carrying sanitation messages for specific target groups have been prepared and distributed. Posters are put in locations where they can be easily viewed by people. e.g. in public places where people gather, such as health centres,churches, bars, schools, political party offices etc. The problem with this method of promotion is that, it is expensive to prepare leaflets, booklets and posters. The experience has shown also that, in distributing the booklets one has to be careful, because if the booklets are given to the wrong group/individuals they are likely to be put on shelves. Another danger is that not every beneficiary is able to read and understand the messages being conveyed by this kind of materials.

(e) School/Community Level Competition on Sanitation

The best method of delivering messages to parents is through school children. Children after school activities, tend to talk to their parents about what they have learnt at schools. Some of children are inquisitive to ask their parents some questions to acquire more knowledge about the subject or to check whether their parents are knowledgeable on the subject matter. Through such discussions whatever is taught to children reaches the parents.

Therefore school children are taught to compose songs, conduct drama, poems etc carrying sanitation messages. Different schools compete and the school which wins receives trophies. These also could be applied to communities at different levels.

(f) Construction of Demonstration of Sanitation facilities options:

Several research have taken place, looking for ways of establishing sanitation facilities which is affordable to different income groups. The research results offering optional facilities have been constructed at strategic sites where they can be viewed easily by the people. It is expected that through this approach people can be motivated to adopt the demonstrated technology in sanitation.

(g) Study Visits:

Study tours to sanitation projects is yet another effective promotional approach. The purpose of these visits is to share experiences.

(h) Advertisements in Mass Media:

One of the effective sanitation promotion method is to advertise in mass media such as the radio, new papers and magazines. The radio is more effective because of it's high coverage and almost cost free to the audience. However,to the promoter it is expensive, as one minute is currently charged Tshs.13,000/= by radio Tanzania

(i) Enforcement of Sanitation by-laws

The existing sanitation by-laws are outdated. There is a need of reviewing and updating otherwise the promotion strategies being proposed will not be effective.

9.4.2 Proposed improvements on promotional strategies at decision making and community levels:

Decision makers have to understand the existing unsatisfactory sanitation conditions through site visits and participating in solving such problems at different levels.

In addition, there is a need to educate and raise and awareness on the importance of improved sanitation among decision makers through organized seminars and workshops. This will influence them to give high priority to sanitation issues e.g. allocating more resources to sanitation.

Sanitation improvement requires a high commitment/political will, and therefore has to be regarded as part and parcel of the policy making process by decision makers.

Improving sanitation situation is a process and promotional strategies should be viewed that way. As such users of sanitary facilities have an important role to play in the planning process, implementation, operation and maintenance. Therefore, users should be consulted and involved in selecting appropriate technology taking into consideration their willingness to pay, their economic position and their cultural perceptions.

The government should provide clear policy guidelines on sanitation issues as a basis for development of the plans. Such clear policy guidelines should be accompanied by appropriate institutional set-up for supportive mechanism in the management, operation and maintenance of the installed systems as well as taking into consideration the long-term planning for expansion of services.

The existing public sectors are inefficient to alleviate the existing poor sanitation situation due to inadequate resources, poor equipment, mismanagement etc. The government should create conducive environments/incentives to encourage and actively involve private sectors to participate in the sanitation sector. For example, the private sectors/companies could be concerned with public latrines or solid waste collection whereby each could obtain an operating license from the urban councils. The private operators could collect user fees which could be used to pay for operations and maintenance of the facilities and to pay for the urban council's rental fees. The profit accrued could be used for reinvestment.

Another area of concern could be handing over the sludge tankers/collectors which are under the urban council to private operators under lease purchase arrangements. This could also be applied to solid waste management.

The government should encourage and motivate or provide incentives to staff dealing with sanitation and health education/promotion for example improving their working conditions, transport, training etc. The provision of adequate motivation is important to raise workers commitment to their sanitation duties.

The wideness of sanitation and involvement of many parties require an effective coordination unit. A proposal is therefore made to establish an effective coordinating unit among institutions involved in sanitation.

Another promotional strategy is to include sanitation elements in school syllabus as a way of conveying sanitation culture/message to children and others.

Another strategy is to enhance various health education and promotion activities at various levels with regard to a target group concerned, such as organizing school competitions, conducting meetings/seminars, construction of demonstration facilities etc.

Community mobilisation for self-help financing and self management should be encouraged. The following measures can contribute to achieve this:

- Strengthening PHC committee at all level
- Strengthening/establishing sanitation committees
- Mobilizing local resources for sustainable implementation.
- Training community members responsible for managing and organizing community issues.

There should be an organized routine for daily or weekly clean-up campaigns to ensure community participation and keep surroundings clean.

9.7 Integration.

9.7.1 Improvements in the balance between water supply, sanitation and hygiene education and their integration

Current practices:

The implementation of water and sanitation programmes has been going on in the country for years since 1971. Although in theory, sanitation has been incorporated in the planning processes for many years, its planning has been done on adhoc basis. As a consequence, the implementation of sanitation sector has lagged behind water supply.

The imbalance between water supply and sanitation has been

attributed to several factors, inter alia; involvement of different institution, low priority accorded to sanitation from the users up to the decision makers at national level.

At national level the Ministry of Health is responsible for rural sanitation and hygiene education, while the Ministry of Water, Energy and Minerals is responsible for urban sanitation and water supply in general. At the regional level urban sanitation is operated and maintained by the urban councils. Community mobilization is taken care by Ministry of Community development, Women Affairs and Children.

As it can be noted, sanitation sub-sector has been disintegrated among different institutions. As a result there is weak coordination mechanism among these institutions, consequently, unclear demarcation of responsibilities hence duplication of effort, resulting in the dispersion of scarce resources and in mismanagement.

Compared to water supply, sanitation has been given low priority at national level. This is caused partly by scarce resources available to the nation compared to the competitive high demand for the same resources. For example, funding level for sewerage and sanitation has remained very low. Funds allocated annually for sewerage and sanitation since 1979 todate average out to be 0.45% of the total Government Development Budget. Looked at from the actual requirements the annual allocation as compared to the annual requirements according to the five year developing plan has been on the average about 30%. This has limited to a greater extent any meaningful intervention in trying to solve the current problems.

Beneficiaries have low priority for sanitation. The reasons could be the following; the consequences of poor sanitation is not immediately felt by users. Unlike water, people can live without appropriate sanitation facilities. For sanitation there is an alternative, one can use neighbour's latrine, guest house or hotel sanitary facilities.

Sanitation is usually regarded as an individual activity while water supply is considered as a community concern. For example, people are mobilized to construct water supply systems leaving latrines to be constructed by individual households.

Suggested improvements:

To reach the goal of safe water and improved sanitation by 2002, planning and implementation of water, sanitation and hygiene education should be balanced in their integration as addressed below.

1. Integrate fully the hygiene education in all stages of project/programme cycle of water supply and sanitation. This will:

   (a) motivate households to improve their sanitation facilities.

(b) ensure latrines/sources of water supply are cleaned and maintained.

2. Clarifying the respective responsibilities of the key governmental organizations involved.

3. Establishing the functioning/coordinating mechanism.

4. Review of policies and/or strategies be regarded as an important exercise towards the implementation of policies.

10. PRIVATISATION

At the broadest level, privatisation refers to the introduction of market -forces into the economy. Participation of the private sector in the delivery of Water and Sanitation Services is essential for effectiveness and efficiency. Currently, implementation of water and sanitation services in the country is dominated by the public sector as well as foreign private firms. Involvement of domestic private firms has at best been minimal. The inability of domestic private firms to attract and retain experienced and qualified staff is their most serious problem. A further pervasive constraint is lack of experience. Domestic firms are often trapped in a vicious circle; Without experience, they cannot qualify for assignments; without assignments, they cannot gain experience. Their lack of managerial skills shows up in unsound proposals, unrealistic cost estimates, and weak long range plans. Many of these weaknesses are symptomatic of underdevelopment. The government's despite being the principal client, has no effective strategies for developing,the domestic private sector. In fact the sector has been stifled by governments preference for public firms. Excessive reliance on price bidding, long delays in payment, and reimbursements at less than the costs incurred, further impact the Financial viability of domestic firms and force them to cut corners to the detriment of quality.

Private enterprise provides the best opportunities because it has the characteristics required to develop entrepreneurship, vision, innovation, creativity, decisiveness, high energy, readiness to seek challenge, willingness to take risks, and concern for client's interests.

Domestic firms are conversant with local conditions, easily obtainable when need arises, and require (in most cases) payment in local currency. Privatization however is not a panacea. Some activities have to remain in the hands of the public sector. The following is a description of areas recommended for private sector participation in water supply and sanitation services:-

10.1 Areas of Private Sector Participation

Potential for private sector participation exists in the following areas

- consultancy and Professional Services
- construction
- drilling
- manufacturing
- spares supply and distribution
- haulage
- servicing
- guarding and security
- storage and warehousing
- financing and
- operation and maintenance

10.1.1 Consultancy and Professional Services.

The consulting engineering and architectural profession plays a key

role in planning, designing, and implementing development Projects.

As far as possible, domestic consultants should be engaged to carry out feasibility studies, designs, supervision of projects and conduct training for sector personnel. The consulting profession in Tanzania is generally characterized by foreign private firms as well as a few large firms, mostly in the public sector, that get their work without competition and dominate the market. The uncertainty of the market and the lack of continuation of work adversely affect their cash flow and ability to retain good staff.

For quite some time, the Government has expressed its aim to protect domestic firms from foreign competition. However,in practice,preference is given to foreign firms because of their broader experience and superior technical staff. This further impairs the technical viability of domestic firms and forces them to cut corners to the detriment of quality.

Quality is not perfection; it is the search for an optimum solution to meet the clients',requirements in a particular set of circumstances. And in the construction project,quality starts at the project feasibility and design stages. The consulting firm is the key party, and in many cases the only party,with the opportunity and the obligation to ensure quality throughout the investment cycle. Its ability to discharge this responsibility depends not merely on how its proposed services are rated in competition; but more important on its culture, values, and professional commitment to the objectives of the client and the interest of the public.

Quality has many dimensions; a project's efficiency, safety, construction-ability, functional adequacy, life cycle costs, forward and backward linkages, social efficiency, environment, sustainability and productivity. Other requirements of quality are also crucial; for example, timely project completion and aesthetic beauty. The spectrum of quality is so wide that potential for quality lapses in a project design is substantial.

10.1.2 Construction

As the approach towards water supply and sanitation services delivery is changing from "supply driven" to "demand driven"; the role of the Government is also changing from merely being a "provider" of services to a "regulation" and "facilitator". This, the concept of "effective demand"!

During construction of water supply and sanitation facilities, increased use of local constructors and individual artisans is encouraged. Contracting out tasks has the advantage of ensuring speed of implementation and guaranteeing quality. The Government's role becomes supervisory.

The private sector can be contracted to construct water retaining structures, lay pipelines, and instal electrical/mechanical equipment. Likewise The Private Sector can be engaged in earthworks during dam construction. Experience has shown that such involvement speeds up dam construction and ensures optimum delivery.

10.1.3 Drilling

Potential exists for private sector participation in groundwater development through drilling of boreholes and shallow wells. There are an adequate number of artisans available who can be contracted (singly or collectively) to carry out drilling activities. These could be contracted by communities, individuals, institutions and the Government to carry out drilling assignments at an agreed remuneration, package.

Equipment owned by the Government could be leased out to these individuals/groups on a case-to-case basis. This would rationalize the use of such equipment some of which is either now lying idle or being put to limited use (in terms of output). It should be are permitted officially to complement Governments efforts through development of own sources and selling water supply services to the public or other institutions. In this case, the role of the Government would remain that of is controller and regulator to over seeing standards and ensure that downstream users are not affected in terms of quality and quality of water availability thus the granting of water light.

10.1.4 Manufacturing

Local production of hand pumps,pipes and associated material is important from the viewpoint of availability, standardization and replicability. The private sector is expected to play a pivotal role in the manufacturing of essential inputs into the sector. Such inputs range from water treatment chemicals to spare parts, pipes and fittings. Local production of pumps, pipes and water treatment chemicals is at its infancy. Currently, there are two hand pump production factories in the country (one based Dar es Salaam and the other one at Morogoro) There are three factories based at Dar es Salaam engaged in the production of pipes (namely;Aluminum Africa (PIPECO) Tegry Plastic and Simba Plastics both producing PVC pipes. There is one factory at Dar es Salaam (namely ICI) which is engaged in the production of chlorine gas used in disinfection of water. On account of their monopoly position these industries enjoy a monopoly position, which does not promote efficiency in terms of output, quality and price in the market place.

Potential exists for production of cesspit emptiers, concrete pipes, latrine slabs, water retaining tanks, water vending equipment, water treatment chemicals, pumps, spares, etc.

10.1.5 Spares supply and distribution

Sustainability of water supply and Sanitation Systems is very dependant on an effective and efficient system for supply of spares. Local hardware shops should be encouraged to stock basic spares of hand pumps, pipes, fittings and associated material in order to decentralize procurement and distribution and keep down time following breakdown of pumping equipment.

Effective demand for these items will be attained through local availability of funds and artisans and sensitization of the

beneficiaries on ownership of their schemes.

10.1.6 Haulage

Implementation of the water and sanitation programme involves bulk movement of construction material pipes,reinforcements cement sand aggregates, timber,etc.) Of late, Government owner equipment has turned out to be inefficient to thus the delays in delivery of material. This is due to lack of maintenance and old age of haulage trucks.

Potential exists for the private sector to participate in such bulk transport of material and deliver in a timely manner. Initially this may sound to be a costly proposition, but as the market forces come into play,costs will gradually even out.

10.1.7 Servicing

Regular servicing of equipment, vehicles and plant is essential for their efficient operation. Potential exists for the private sector to participate in this area, particularly in garage facilities, etc.

Further, service contracts can be entered into with local contractors for electrical, mechanical and electronic equipment (lists computers, air conditioners, pump rewinding,etc)as well as vehicles.

10.1.8 Guarding and Security

Of late, private groups of guarding and security teams (eg ultimate security, Group 4 etc.) have proved to be efficient in their job. Such teams can be engaged on contract terms to guard facilities, stores and offices. This may prove cost effective in the long run considering the current state of security.

10.1.9 Storage and Warehousing

There is a growing demand for secure storage space particularly for equipment on transit to project sites. The private sector can be contracted out to provide such storage at an agreed fee.

10.1.10 Financing

Traditional sources of funding for the Sector (ESAs and the Government) are unable to raise the required funding for sector delivery. The annual financial requirement is estimated at T.shs. 45 billion compared against T.shs. 9 billion actually realized. Potential exists for The private sector (being a non-traditional source) to invest in the sector. Individuals and private Financing institutions such as the Tanganyika Development Finance Limited (TDFL) could participate in extending medium-term and long term loans and credits to private developers (and the Government) in order to invest in the sector. Thereby increasing the capital base for the sector.

10.1.11 Operation and Maintenance-Management

Potential exists involvement of the private sector in the running water supply and Sanitation services particularly in Urban areas (Refer Annex I-Case study, Tanga).

The Government could enter into" management contractS" with private companies for such assignments Here private sector management, technology/or skills are provided to the Urban Water Supply and Sanitation utilities in respect of state owned assets for an agreed period of time and compensation. While there is no transfer of ownership and therefore no divestiture of assets, these arrangements can be used to "privatize" management and operations and thereby possibly increase the efficiency and effective use of state assets.

Although sometimes regarded as an intermediate step toward full privatization, "management contracts"are more often used as temporary measures to turn a state owned utility to an acceptable level of operations and profitability. The injection of private management, presumably selected for its operational or other skills, represents an important and effective non-sale form of privatization.

In this form of arrangement, while the contractor might be given extensive management powers and operational control, it has no financial exposure and receives its fee regardless of the profitability of the utility. Where performance or incentive payments are part of the overall compensation package, these are forfeited if the level of performance or other criteria are not met). The advantage of this arrangement is that ownership is retained by the state, a defined degree of control is maintained, and a high level of management and other skills is injected into the enterprise, enhancing its overall efficiency and profitability.

The choice of the management company is the most important element determining the results of the arrangement. It may be a joint venture between the Government and a private company.

A properly structured remuneration package must be devised for the provision of the management company's personnel in accordance with the agreed formulae, including a small profit element; agreed reimbursable costs; and incentive payments linked to profit, production or other appropriate formula.

There is no term which is standard in management contracts, but if the management makes no investment which it needs to recoup over a longer duration, three to five years is normal depending on the scale and complexity of the problems faced.

The principal issue here is the actual reliability, skills and seriousness of the management contractor.

Recommendations

Considering the changed approach from "supply", to" demand,"

driven, the following recommendations are made to enhance the role of the private sector in delivery of Water Supply and Sanitation Services.

- As far as possible domestic consultants should be given preference on sector jobs. Joint Ventures between local and foreign consultancy firms should be encouraged so as to transfer know-how.

- During implementation of water supply and sanitation projects, emphasis should be placed on contracting full or part of the works to private artisans and contractors

- Drilling jobs should as far as possible be delegated to the private sector. To this effect the government should lease drilling equipment to private drillers on a case -to- case basis

- Non traditional assignments such as spares supply and distribution, haulage,servicing of plant, vehicles and equipment and guarding and security should increasingly be delegated to the private sector

- The Government should enter into management contracts with experienced private firms to run and maintain Urban water supplies

- The private sector should be involved as non-traditional source of funding for water supply and sanitation services

AREAS OF PRIVATE SECTOR PARTICIPATION - CASE OF TANGA URBAN WATER SUPPLY

Tanga Water municipality water supply is hereby cited as an example to illustrate the potential that exists for private sector participation in operation and maintenance of Urban Water Supply and Sanitation services through" management contracts.

Current Situation

Table 10.1 depicts the water supply production picture and points out areas of operational inefficiency depicting that only 17% of the water produced is actually paid for. The table shows that with proper management attainable through i.a management contracts with private contractors more revenue would Management contracts have the following advantages:- advantages:-

(i) improved delivery
(ii) increased revenue and
(iii) differed capital investment on production system.

Table 10.1

Tanga Urban Water Supply, Anticipated Improvement

	Current Situation		Anticipated improvement	
	M^3/day	%	M^3/day	%
(i) Water Production	26 000	100	26,000	100
(ii) Physical losses(Estd)	9,100	35	5,200	20
(iii) Non Physical losses (Estd)	3,900		1,300	5
(iv) Actual Delivery	13,000	50	19,500	75
(v) Billing Efficiency	9,100	70	15,600	80
(vi) Collection Efficiency	4,600	51	12,480	80

10.2 Regulations (The Authorisation process)

It is observed that the nature of authorisation process greatly influences the ease with which a privatisation program is decided upon and implemented. In some cases, authorisation from executive or legislative branch is required. In other cases, the overall privatisation programme is authorised by law, with specific privatisation decided by a designated entity that may have been created for the purpose.

In Tanzania the authorisation process was initiated by enactment of National Investment (Promotion and Protection) Act No 10 of 1990. The thrust of the above Act is to promote, co-ordinate, regulate and to monitor foreign and local investment in the Country.

"Investment" is defined to mean contribution of capital or foreign capital by an investor to new enterprises or rehabilitation of an existing enterprise or a new enterprise. "Local investment" means an investment by a national investor. In a nutshell it can be said the National Investment (Promotion and Protection) Act was enacted to facilitate institutional framework to be established for investors to operate within and to provide them with incentives and guarantees in order to encourage investments.

It remains to be seen whether the Act is facilitating smooth running of the above organs, in particular the privatisation process of water industry. In a bid to complement the above Act,Public Corporation Amendment Act 1993 was passed by Parliament in October 1993 and the thrust of the Act is to make the same an effective vehicle for parastatal reforms and privatisation.

10.2.1 Review of existing legislation, codes, procedures and regulations

It is important to note that many parastatal organisations in the Country have been created through three instruments namely Public Corporation Act of 1969, Companies Ordinance Cap 212 and specific legislation respectively. In the same vein, the parastatal organisation can only be dissolved by an equivalent instrument. For Parastatal organisations governed by Company Ordinance Cap 212 all steps relating to dissolution, liquidation (normally decided by shareholders Meeting)are spelled out by the Articles of Association of the organisation concerned as per Company Ordinance. For a parastatal organisation established under Public Corporation Act 1969 and the parastatal organisation established by specific, respectively, the same should be dissolved by Parliament and not otherwise. Notwithstanding the above procedure, some of the parastatal organisation have been earmarked for restructuring and privatisation (others have been restructured and privatised) without undergoing steps mentioned above, and it is no wonder that some members of the Parliament Complained bitterly when Public Corporation Amendment Act 1993 was tabled.

One of the objective of above Act was to formalise and pave way for the Presidential Commission for Parastatal Sector Reform to have statutory powers in carrying out its tasks. The initiation of privatisation process required legislative authorisation right from the beginning, spelling out basic conditions applying to the process rather than leaving the task to an executive branch designated agency. Advantages of specific legislation or mandatory roles on the subject is the possibility of introducing strict requirement for the objective valuation of assets and for setting the sale price. In the absence of such rules for private sales, the door is open to a wide range of arbitrary decisions that might result on the state not getting a fair price. The National Investment (Promotion and Protection) Act No 10 of 1990 has a schedule which shows three important areas namely:

(A)Priority areas for investment (B) Controlled and Reserved areas and (c) Activities reserved for local investors. Controlled and Reserved area is further divided into (i) Controlled and reserved area:

For the purpose of this paper we are interested to use where the water sector is slotted. The Act stipulates that the following areas of strategic importance are reserved exclusively for investment by public sector:

- the generation and distribution of electricity in urban areas, or through the national grid

- the provision of public water for domestic and industrial purposes

As seen above water industry is seen as of strategic importance and therefore is reserved exclusively for investment by public sector. It is common place that for many years water has been regarded as a free commodity offered by the government to the people, and with such an attitude it is very difficult for the private sector to be attracted to the water industry as the environment is not conducive for private investment. Time is now ripe for creating on enabling environment for Private Sector involvement in the water sector by amending the National Investment (Promotion and Protection) Act Schedule B(2) which talks of exclusivity of public sector in the water industry.

Presidential Commission for Parastatal Sector Reform has prepared a comprehensive master plan which has a force of law by virtue of Public Corporation Amendment Act 1993, however the same is silent on privatisation of water industry.

Various methods and procedures for privatisation have been used by the Commission which includes among others (i)private sale of share i.e sale of all or part of government share holding in a Corporation to a single entity or group. And on many cases it is conducted through negotiations or competitive bidding process. (ii) Sale of Corporation assets i.e sale of Assets after dissolution of the Corporation etc. It is interesting to note that Public sale of share has not featured as expected. The same entails distribution to the general public of all or of shares held by Treasury Registrar. The offer can be on fixed price or on tender basis. Apart from NUWA which is expected to have a share Capital for its initial investments, the provision of public water supply for domestic and industrial purposes in both urban and rural is budgeted from the Treasury annually. NUWA at present operates in Dar es Salaam only, in the towns the Ministry of Water Energy and Minerals assumes responsibility. The current situation calls for a particular set up in each town or area to operate and maintain water supply systems on self-financing basis.

10.2.2 Recommendations

There is an urgent need in a bid to create an enabling environment for privatisation of water industry to amend the National Investment (Promotion and Protection) Act No 10 of 1990. Schedule B: Reserved Areas: It should be stated explicitly that private sector should be involved in the provision of public water for domestic and industrial purposes. The amendment is within the powers of the Investment Promotion Centre, because the Act stipulate that I.P.C.will,from time to time, advise the Government on such areas to be reserved for public sector. The Ministry of Water,Energy and Minerals should communicate with Investment Promotion Centre so that water industry is open to private investment. In the same vein Water Utilisation (Control and Regulation) Act No 42 of 1974 should be amended by introducing economic user fee i.e different rates of fee for domestic,industrial, hydropower etc so as to attract private sector

investment in water industry. The amendment can be effected by sending proposals to the Chief Parliamentary Draftsman of the Attorney Generals Chambers.

Likewise the master plan by the Presidential Commission for Parastatal Sector Reform should be reviewed with a view of inserting privatisation of water industry. The Ministry of Water Energy and Minerals should communicate with the Commission so as to facilitate the above.

It is significant to point out that in some jurisdictions within the Country beneficiaries have started to run water projects in their localities. In Kilimanjaro region they are in process of forming a Company which will run East Kilimanjaro Trunk Main on Commercial basis. This appears to be a healthy situation, the trend should be encouraged in other areas as the same will lessen the burden of the Treasury to budget for such schemes.

Involvement of the private sector has only been limited to provision of goods and services, the private sector has yet to be significantly involved in funding and investing in the water sector. And hence the need for creating an enabling environment by the government by categorically taking deliberate steps of involving the Private Sector in implementation of water projects. The Government should come out with an official statement on the aspects of privatization, so that the private sector is attracted to pay a key role in the whole process of privatization and involvement in the water industry.

11. THE TARGET 2002 (WATER SUPPLY AND SANITATION)

11.4 PLANNING

Introduction

Sectoral plan for the water and sanitation sector is a composite of regional (for water supply only) and national projects that include water supply and urban sanitation.

Sector national programmes are planned and implemented by MWEM whereas regional ones are conceived, planned and implemented by the respective regions. The Ministry of Health (MoH), has its own sanitation programme. Rural water sector development is dealt with by both the regions and districts. Rural sanitation development lags behind in terms of the level of development compared to water supply. MoH has to take a leading role in guiding rural sanitation development, in collaboration with District Councils.

It is gratifying, however, to note that both water supply and sanitation sectors have already prepared blue prints to guide their development. The issue of integrated development of the water sector as a whole, has to be seriously addressed in order to strike a balance between water supply and the disposal of waste water in both urban and rural areas.

It may be of interest to note that the National Urban Water Authority, NUWA, is charged with development, production, distribution and management of urban water supply but it is not concerned with the safe disposal of waste water. In DSM a different body, the Dar es Salaam Sewerage and Sanitation Department (DSSD), has already been created and is dealing with the sanitation aspect. In order to plan for the sector development an integrated approach, is therefore, called for.

11.4.1 Review of Current Sector Plans

(a) **Current Programmes**

Most of the current sector programmes/projects were started many years back. They were conceived in isolation to serve felt needs at those different times and they have been under implementation for so many years now.

Prior to the financial year 1993/94 planning of sector development had been undertaken in the traditional manner, project approach, dictated by the Five Year Development Plan or short term remedial measure plans under the guise of structural adjustment programmes or the economic recovery programmes.

The projects lack long range horizon objective and most of them, as observed earlier, have remained under implementation for sometime now and have lost track and their initial development objectives.

Table 1 is a complete list of on-going sector programmes/projects. They show respective dates when they were started and description on whether they are likely to get completed in the near future or

not. Most of them are open-ended and are likely to go on indefinitely if there is nothing to stop them. The just introduced Rolling Plan and Forward Budget concept will go a long way to assisting the nation brace with development culture that allows definite time frame for all development programmes.

Table 1 (a): Current National Water Sector Development Programmes

NO.	NAME OF PROGRAM/PROJECT	STARTED	REMARKS/PROBABLE DATE OF COMPLETION
	A. Water Resources Evaluation		
1.	Water Master Plans	1971/72	► Dodoma, Singida and Morogoro are yet to be prep.
2.	L. Victoria Hydromet	1967/68	► Inter Regional completed in 1989/90 - TZ progr.is on
3.	L. Nyasa Hydromet	1985/86	► Open-ended project - water resources cataloguing
4.	Dodoma Groundwater Assessment	1970's	► Open-ended: more data for the Makutopora Basin
	B. Water Supply		
1.	Maji Facilities	1965/66	► Open-ended: create infrastructure for water dev.
2.	Dam Construction	1972/73	► Open-ended: for arid regions
3.	Morogoro/Shinyanga RWS	1978/79	► Programme is open-ended. Netherlands is assist.
4.	Singida Rural W/S	1977/78	► Open-ended: LWF/TCRS are assisting
5.	Wood/Bamboo Project	1987/88	► Program is being phased out - going conventional
6.	Wanging'ombe RWS	1978/79	► Expected to complete in 1995/96
7.	Mzenga Rural W/S	1982/83	► To get completed in 1995/96
8.	Mtwara/Lindi W/S	1982/83	► Original plan still being pursued by MWEM
9.	Rondo W/S	1988/89	► This is the second Phase, to complete in 1994/95
10.	Woodstave Project	1987/88	► Project to gradually phase out
11.	Bagamoyo Rural WS	1977/78	► Second phase after DANIDA reall. more funds 94/95
12.	DANIDA-Assisted Progr.	1983/84	► Implementation of Water Master Plan is still on
13.	Mwanga Rural W/S	1981/82	► Extensions are being carried out, thru by 1995/96
14.	Mwamapuli/Bulenya W/S	1990/91	► To complete in 1995/96
15.	Defluoridation Project	1985/86	► May get completed in 1994/95
16.	Rehab. of Equipment	1988/89	► Open-ended, taking care of heavy equipment etc.
17.	Rehab. of Rural W/S	1983/84	► Open-ended programme - pan-territorial
18.	Rural Water Q. Monitor.	1988/89	► Open-ended programme - Pan-territorial
19.	DSM Mbagala W/S	1993/94	► To complete in 1994/95
20.	DSM Mtoni L. Lift Pump	1993/94	► To complete in 1994/95
21.	Mwanza Urban Water	1985/86	► Phase II: expected to complete in 1996/97
22.	Arusha Urban Water	1980/81	► Expected to complete in 1994/95
23.	Dodoma Urban Water	1973/74	► Longterm programme yet to take off
24.	Singida Urban Water	1991/92	► Expected to complete in 1997/98
25.	Iringa Urban Water	1980/81	► Longterm program being worked out, possibly 98/99
26.	Mugumu Urban Water	1980/81	► Not known (Source: Dam) under construction
27.	Musoma Urban Water	1980/81	► May complete in 1994/95
28.	Mbeya Urban Water	1989/90	► To complete in 96/97, longterm to follow
29.	Mtwara	1984/85	► May complete in 1994/95
30.	Moshi	1979/80	► Longterm being organised
31.	Shinyanga	1976/77	► Extension of the former phase
32.	Tabora	1976/77	► Extension is being contemplated
33.	Maswa	1987/88	► In maintenance period, to complete in 1994/95
34.	Newala	1986/87	► Modifications are undertaken: fuel to electricity
35.	Designs and Studies	1978/79	► Open-ended: pan-territorial project
36.	Logistical Support	1988/89	► Open-ended: pan-territorial project
	C. Sanitation		
1.	Arusha Sewerage Project	1992/93	► Expected to complete 1995/96
2.	DSM Stormwater Drainage	1986/87	► Open-ended
3.	Tanga Sewerage Project	1991/92	► Probably 1993/95
4.	Morogoro Sewerage Proj.	1989/90	► Expected to complete 1994/95
5.	Environ. San. Project	1986/87	► Open-ended
6.	Mwanza Sewerage Project	1992/93	► May complete in 1996/97
7.	DSM Sewerage Project	1986/87	► Rehab. open-ended
	D. Training		
1.	Regional Training	1975/76	► Open-ended: pan-territorial
2.	Water Resources Instit.	1978/79	► May complete in 1996/97

With such a long list of un-ending programmes/projects, it becomes difficult to estimate how many people have already been served through these numerous and unending extensions which, in most cases, have been undertaken on an ad hoc basis, causing strain on the economy, which has been blamed for impeding sectoral development.

Table 1 (b): Current Regional Sector Development Programmes

NO.	NAME OF PROGRAM/PROJECT	STARTED	REMARKS/PROBABLE DATE OF COMPLETION
1.	Surveys and Investig.	1940's	► Open-ended program
2.	Urban Water Supply	Crush Progr.	► Function of the state/age of schemes in towns
3.	Rural Water Supply	Ad hoc	► Ad hoc programs responding to needs in villages
4.	Rainwater Harvesting	1992/93	► Pilot and investigations: open-ended
5.	Water To KIDC	1991/92	► Water to K'jaro Indust. Dev. Co., may compl.'95
6.	Arisi-Himo water supply	1992/93	► May complete in 1994/95
7.	Lyamungo water project	1992/93	► May complete in 1994/95
8.	HESAWA programme[1]	1980's	► Open-ended programme

It is evident that coordinating such un-ending projects is very difficult. All of these programmes don't have scope of work, they do not have time frame to meet development criteria. Most of them have been implemented as if they were recurrent and the recurrent projects have been in the development vote for a long time after being completed. This is one of the problematic area within the water sector.

(b) Current Programmes and New Approaches to Planning

(i) The Rolling Plan

The Rolling Plan and Forward Budget (RPFB), as a consolidated medium term planning and financial tool, is meant to eliminate planning weaknesses which were experienced in the traditional planning system which ceased to be used in the financial year 1992/93. The RPFB is expected to increase efficiency in the overall national development planning and budgeting system, the basic characteristic for it being rolled over three years, thus facilitating smooth outlining of policies and resource allocation, in line with the defined policies. It is looked at afresh every year with a view to making some adjustments on the basis of the results of implementation obtained in the foregoing financial year.

In order for the RPFB to function properly, there must be adequate and reliable statistical data, emphasis being on projects which are likely to contribute more to the realisation of national sector goals. This emphasises the point that programmes/projects which do not have an impact on

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[1] HESAWA means Health and Sanitation through Water programme, a model of development programme that tackles water and sanitation problems in an integrated manner, as introduced by Swedish financed programme in the Lake regions of Mwanza, Mara and Kagera.

the economy or community development will not be allowed or carried out in RPFB.

(ii) **Sector Development and the National Rolling Plan**

Implementation of the water sector programmes in order to meet the set sectoral objectives of the 2002 target requires a flexible programme schedule with relevant resource inputs. If the programme implementation is made rigid, as it is now, it is likely that the resources required will not be available. It has been discussed elsewhere that sectoral development has to be symmetrical with that of other sectors in order to maintain sectoral equilibrium or complimentality. Even if the national sectoral priorities are shifted in favour of the water sector, there will always be some snags to be solved first before active implementation of the said programme is attempted. Logistical support and institutional set up which is better tuned to catering for basic requirements of the programme must be dealt with first.

The issue of logistics and institutional support or capacity building has been addressed in chapter I which deals with Institution and Capacity Building. It suffices to say that when we set milestones for water sector implementation to meet the set objectives of the 2002 target, our assumption hinges on a perfect institutional framework which is devoid of un-necessary implementation hitches.

(iii) **Meeting the 2002 Sector Target: Milestones**

Given the rate of population increase of 2.8%[2], the task of reaching the set target of serving all Tanzanians with clean and potable water by the year 2002 becomes definite but challenging. It is important, however, at this juncture to propose some way of getting about the task so that by the end of the period (1993 - 2002), all the people can be served with water.

At various times experts have been questioning whether the nation can succeed in implementing such an ambitious programme when there are other equally important sectors problems to be attended.

If the Government is still resolved to carry through the programme then certain assumptions must be made otherwise, as noted earlier, it is not possible for the set objectives of the 2002 target to get realised. Before looking at the assumptions, let us look at the following proposal on what can be done with the existing and coming RPFB cycles in order to reach the target:-

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2 1988 Tanzania National Census: Bureau of Statistics, President's Office, the Planning Commission, Government Printer: Dar es Salaam

Cycle	Rolling Plans	Total %-age Served
1.	1993/94 - 1995/96	68
2.	1996/97 - 1998/99	82
3.	1999/2000-2001/02	100

To effect the above recommended levels of service to the people, some analysis is required. This is given on **Table 2**. This may act as milestones to the successful execution of the 1993-2002 water programme, given certain assumptions, as appears on section (iv) below.

Table 2: Proposed Coverage to Reach the 2002 Target

Projected Total population (Million People)				Projected Population figure to be Covered to reach Target							
1993	1996	1999	2002	1993	%	1996	%	1999	%	2002	%
25.3	27.5	29.9	32.5	12.7	50	18.7	68	24.5	82	32.5	100

(iv) **Assumptions for 100% Coverage by the Year 2002**

Proposing the levels of water service to the people as appears on **Table 2**, necessitates the following assumptions:

- The Government alone can not meet the required funding levels but, as per the Water Policy, all the concerned bodies, including the Government, the sectoral support agencies, the beneficiaries, non-governmental organizations and the private sector, must close ranks and facilitate the realization of the set target objectives by playing their respective roles in funding the sector development;

- There should be an integration of the private sector initiatives into the programme action plan so that its input is part and parcel of the national efforts to implement the tasks of the programme so as to reach the 2002 target;

- Full cost recovery on O. & M. of urban water systems must be installed if the target is at all to be reached 100%;

- Adoption of the least cost and effective technology, depending on the geographical and conditions obtaining in various parts of the country and also standardisation of equipment for easy maintenance and low O. & M. costs;

- Optimal use of the existing sector personnel and motivate them through attractive rewards in terms of various incentive packages as well as through appropriate schemes of service responsive to their tastes;

- Establish or strengthen co ordination mechanisms at the national level so that all the sector actors can understand who is doing what through information sharing and dissemination. MWEM should take a leading role towards coordination of the sector development;

11.4.2 Sector Strategies Beyond 2002

(a) **Current Strategies within the Rolling Plan**

The current Rolling Plan and Forward Budget for Tanzania, as noted earlier, covers the period 1993/94-1995/96 and defines eight broad categories of strategies to be adopted so that the sector development can achieve the set objectives embodied in the target. The broad categories are as follows:-

(i) Community participation;

(ii) Emphasis on Maintenance and Rehabilitation of water schemes as opposed to new investments;

(iii) Adoption of appropriate technology;

(iv) Encouragement of the private sector;

(v) Human resources development and capacity building;

(vi) Development of rural and urban water resources by making use of the existing and future water resources studies, like water master plans;

vii) Improve efficiency in the sector;

(viii) Improvement of environmental sustainability of water supplies.

These broad categories of sector development strategies are supported by the Water Policy document which guides sectoral development and need not get repeated here. What is more important, however, is whether the **Forward Budget** for the period 1993/94-1995/96 is adequately reflected as a basis for planning the budget requirements which is likely to guide sector implementors to effect positive sectoral development.

(b) **Strategies: Beyond the 2002 Target**

Strategies to be adopted in order to facilitate smooth and sustainable sector development are a function of what is laid today. What is important after the year 2002 is the consolidation

phase to maintain and sustain what has been obtained during the implementation phase. This means that the culture of proper O. & M. will be an order of the day.

It is hoped that after the year 2002 people themselves will have assumed responsibility of taking up their schemes as their own and the role of the Central and Local Governments will hinge on giving technical support to them. The Central Government will also sustain and provide the resources required in terms of personnel to assist districts and villages build their capacities for sector sustainability as well as improving efficiency in the sector.

Important issues that should also be considered in the post Target era are:-

(i) Firstly, the Government through MWEM should update all water master plans which were prepared long ago and have now become obsolete to the extent that they can no longer be used as basis for the current sector development. Emphasis must be on the appropriate technology which can be easily adopted by the people for easy application and sustainability, that is considering issues on least cost technology for both investment and the aspect on operation and maintenance costs.

(ii) Secondly, the role of the private sector in sector development must be taken more seriously and a positive relationship between the people and the private sector must be installed, more transparent and explicitly supported by the Government so that the people can feel that the private sector is part and parcel of their life rather than still looking to the Government as the only Messiah for their water issues and problems.

(iii) Thirdly, the Government must now concentrate on schemes rehabilitation and handing over to the people for O. & M. It is wise not to hand over dilapidated schemes to the people. Since the Government will have eased up with the investment burden of providing water to the people, it is opportune for it to utilise the apparent "window" to mend the broken/fallen threads of the old schemes so that they can once again be put to use before the handing over is done.

11.4.3 The Target and the National 3 Year RP Plan

(a) **The Current Rolling Plan: 1993/94-1995/96**

Indicative financial allocations for water plans in the current cycle of RPFB are not responsive to the basic requirements of RPFB. It may be at the launching of the concept of RPFB the Government

did not give enough time to address resource allocation to the various sectors. One of the planning tenets of RPFB is to improve links between planning and budgeting and also to strengthen the links between policy and the allocation of funds for both development and recurrent activities. It also allows flexibility on fund swapping from development to recurrent and vice versa, depending on the type of symmetry which is required to effect efficient utilisation of resources in order to get the desired results.

Having the fore said in mind, one could expect that sectoral development funding in RPFB could have been reflected properly for each sector in the First 3 Year cycle of the RPFB (1993/94-1995/96).

Without going into the details of macro-economics of the overall national sectoral development objectives, it suffices to look at the proposed RPFB funding to see whether the figures are actually a reflection of sectoral requirements, with special reference to the water sector.

Table 3 (a): Water Sector RPFB Allocations (Million of T.Shs.)[3]

INSTITUTIONAL LEVEL	1993/94	1994/95	1995/96
Ministries	22,738.7	20,214.5	18,247.7
Regions	3,680.6	3,272.0	2,953.7
District Councils	1,320.1	173.6	1,059.4
Urban/Town Councils	87.1	77.5	69.9
TOTAL SECTOR:	27,826.5	24,737.6	22,330.7

Table 3 (b): MWEM Total Allocations for the Three Sectors[4] in the in the RPFB (Millions of T.Shs)

3 Rolling Plan and Forward Budget: 1993/94-1995/96, Joint Publication: the President's Office (Planning Commission) and the Ministry of Finance: Government Printer Dar es Salaam, Table 13.5.

4 Rolling Plan and Forward Budget, op.cit, Table 13.3

DRAFT

TYPE OF FUNDING	1993/94	1994/95	1995/96
Recurrent	1,337.6	1,424.8	1,561.9
Development: Local & Foreign	21,401.2	18,416.5	15,657.1
TOTAL MINISTRY:	**22,738.8**	**19,841.3**	**17,219.0**

Looking at **Table 3 (a)**, we are made to understand that all financial allocations under the **Ministries** involve MWEM, KILIMO, AFYA and other relevant ministries which may be thought necessary to have independent allocations for water sector development. The allocations, however, are misleading. The allocations reflected on **Table 3 (a)** do not differ from those given on **Table 3 (b)**, which contains allocations for all the three sectors under the MWEM, i.e. water, energy and minerals. Thus the figures do not apply to the water sector only but to three sectors. This is far from being an adequate allocation, considering priority given to the water sector is.

At this point it must be emphasised that the allocation figures of **T.Shs. 22,738.7Mil; T.Shs. 20,214.5Mil and T.Shs. 18,247.7Mil** for **1993/94; 1994/95** and **1995/96** financial years respectively are very small compared to the earlier estimated figure of T.Shs. 10.244 billion, equivalent to United States **$ 52,000,000** which was estimated in 1986 when the 20 Year Water programme (1971-1991), was revised and the figure of T.Shs. 44.5 billion which has recently been estimated as an annual financial requirement for the nation to facilitate 100% water coverage by the year 2002[5]. **Table 3 (a)** combines both Recurrent and development funds for all MWEM's sectoral activities whereby they are 22 sub-votes for the three sectors and irrespective of whether they are water related or not. This renders these RPFB figures not a true reflection of the water sector requirements and hence not to be used as basis for planning purposes for the water sector and may be for other sectors too. This negates the authenticity and reliability of the RPFB blue print.

Table 3 (c): RPFB Allocations in %-age for all Infrastructure

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5 Draft National Water Supply and Sanitation Programme, Ministry of Water, Energy and Minerals, March, 1993

Projects (Millions of T.Shs)[6]

SECTOR	1993/94		1994/95		1995/96	
	Rec.	Dev.	Rec	Dev.	Rec.	Dev.
Works	1.3	6.8	1.4	8.2	1.5	7.8
Communication	0.6	4.6	0.7	3.9	0.9	3.5
Others (Water, Energy etc.)	1.5	6.3	1.4	5.2	1.6	4.5
TOTAL % Infrast:	**3.3**	**17.7**	**3.5**	**17.7**	**4.0**	**15.8**

Analysing **Table 3 (c)**, percentage-wise, it is noted that the given figures paint a very gloomy picture. Under **"Others"** the funding shares are meant for water, energy and the rest. These are budgetary shares for the 3 years of the First Cycle of RPFB (1993/94-1995/96). The development funds shares of **6.3%; 5.2%** and **4.5%** for 1993/94; 1994/95 and 1995/96 respectively are too low for water and other infrastructure sectors. This leads us to conclude that Government does not give priority to water sector against its own resolve to stick to the 2002 target. The allocations do not reflect the Government's intentions and priorities.

(b) **Incorporating the Target into the National 3 Year R. Plan**

If the Government still sticks to the programme of supplying water and sanitation facilities to all the people by the year 2002, then the RPFB Cycles should reflect the national promulgation with the required financial allocations. If, however, the national economy can't contain the programme then the Government should revise the programme target. It is, therefore, suggested that the RPFB's should reflect figures as suggested in the previous chapters discussing **Methodology, Options** and **Modalities** of getting to the 2002 Target. This should take into account the willingness of the Government to restate the target or whether it still sticks to the target or it widens the implementation span so as to reduce financial strain on the national economy.

Restating the target will assist the Government concentrate its efforts and resources on other equally important sectors for social and economic development, as suggested in the **Methodology** chapter. Short of the 2002 target restatement will imply that the Government is still resolved to facilitate 100% water and sanitation coverage

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6 Rolling Plan and Forward Budget, ibidem Table 13.2

by the year 2002 but the resources are simply not there unless options given in the Methodology chapter are considered. If the Government's decision, however, is to go with the imlementation of the Target, then it is important that the financial allocations as appearing in the Rolling Plan and Forward Budget document must be restructured to reflect the needs of the water sector and not just an amalgamation of figures which do not have any logical explanation. It follows from this that the appropriate figure to get incorporated here, taking into account the participation of all the concerned parties in the development of the water sector, must be the estimated figure of about $ 52,000,000, allocated on an annual basis, as appering on **Table 4 (b)** in the chapter on Basic Service Level. Short of that the Government may be advised to opt to one of the Options alluded to in the chapter on Methodology, as earlier stated.

11.5 MONITORING

Introduction

To any socio-economic planner or investor whether he/she is an individual, group of people, a firm, a public body or a Government implementing agency, monitoring is an important aspect in project development/implementation for making sure that whatever is conceived or installed works properly and in accordance with the desired pattern and follows a pre-defined path for the attainment of the set goals within the overall framework of the set development objectives. Monitoring is basically a systematic procedure attempting to measure programme implementation progress, the extent to which a programme is reaching its intended target objectives.

This chapter, therefore, discusses monitoring in the water sector development, the current practices and suggests some recommendations for some improvement that could be effected to bring about more sector effectiveness, efficiency and sustainability.

11.5.1 Measures to Improve On-going Monitoring System

(1) **Current Monitoring System**

(a) **National Development Initiatives**

The post-independence Tanzania finds itself busy with a lot in store in terms of national development in order to catch up with internationally acceptable standards of living for its people. Most social and economic sectors have attracted the sympathy of the Government and have experienced deliberate massive expansions in order to accommodate adequate and viable capacities to cater for people's basic requirements like education, health, rural water supply and sanitation facilities, food, accommodation and national economic sustainability through sustainable income generation

activities.

One example of sectoral development that has succeeded in attaining Government's serious intentions to develop people's livelihood is water.

Implementation of water supply and sanitation programmes has been in place for many years since the 1940's when the colonial administration made practical attempts to build institutionalised framework in which water sector development could well be organised, i.e. the coming into being of Water Development and Irrigation Division (WD & I.D.).

After national independence in 1961, the then Tanganyika Government thought seriously about people's development that had lagged for centuries. It was in 1971 when the then ruling party, TANU, directed the Government to devise a water programme that could guarantee people with clean and potable water near their households by the year 1991. This was the 20 - Year Water Programme. The programme, which was one of the most ambitious programmes ever to be undertaken by the Government since independence, received very extensive publicity in and out of the country because it was looked at as a model of national sectoral development. The milestones which were laid for its successful implementation indicated how planning, as an art, could be so able to cause, direct and manage the required resources for the set objectives to be achieved.

In modern sector planning and implementation, where Rolling Plan and Forward Budget concept has been introduced, project information system (PIS) which can provide solid basis for Rolling Plan preparation, monitoring and project management is urgently required to fill in the existing gap on sector development reporting and feedback system.

The type of information which must be obtained to facilitate smooth sector development includes but not limited to the following sets of data:-

- Status of water supply and sanitation facility services involving sector development coverage i.e.

  (i) Population served;

  (ii) Number of water schemes completed by category type and date of completion;

  (iii) On going projects by category/type;

  (iv) Costs and funding sources thereto;

  (v) Sanitation projects/schemes by type i.e. septic tanks, soak pits, ventilated improved pit

latrines (VIP) and

(vi) Water and environmental pollution and control measures data.

All these could be reported on an annual basis. **Appendix 1** shows the current sector monitoring levels and reporting lines. There are missing reporting and answerability lines between MWEM and RWE; between MWEM and MoH; between MoH and RHO; between RWE and DWE; between RHO and DHO[7]. As per the Decentralisation Policy of 1972, lines of answerability between sector ministries and regions do not pose any problem but the reporting lines. It needs strong co ordination and monitoring links between sector ministries and the regions on sector development.

(b) **Levels of Monitoring**

Water sector development is one of the decentralized activities within the Government implementation machinery. Monitoring has always been problematic despite the laid down procedures as recommended by the 1972 report on Decentralisation[8]. Subsequently, the Government passed an Act of Parliament which ushered in the Decentralisation Policy of 1972. Under the Decentralisation structure Regional Functional Managers are supposed to report on sector development to their respective RDD's and parents line Ministries. Today this aspect is practiced as a "courtesy procedure".

Water Programmes/projects monitoring is practiced at:-

- National level
- Regional level
- District level

(i) **National level Monitoring**

MWEM has two-tier stage monitoring system of water development activities as follows:-

- Central monitoring by the Planning Division;
- Departmental monitoring - by programme or project executing departments /divisions.

Central Monitoring

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7 Ministry of Water, Energy and Minerals (MWEM); Ministry of Health (MoH); Regional Water Engineer (RWE); Regional Health Officer (RHO); District Water Engineer (DWE); District Health Officer (DHO).

8 Mc Kinsey & Company Inc. Achieving the Objectives of the Arusha Declaration - Managing Rural Development, the Government of the United Republic of Tanzania, May 1971.

At the National level, MWEM monitors its programmes/projects or sector activities through the Central Division, the Planning Division, whose role is very crucial for smooth and harmonised sectoral development.

The Planning Division is an arm of the Planning Commission and has the responsibility of developing and managing sectoral development through sectoral planning. It looks for funds for the implementation, co ordination and monitoring of sector activities to reach set sectoral targets. It also evaluates development progress.

Usually water sector monitoring starts when Action Plans are prepared. These are tentative scales which are used to gauge resource deployment vis-a-vis actual physical achievements of the sector. The Action Plans are prepared by sector implementing departments, based on the allowed scopes of sector activities which have been allowed by the Planning Commission and subsequently sanctioned by the Parliament.

The Planning Division supervises the preparation of the Action Plans and submits the same to the Planning Commission where they are used as guides for disbursements of development funds. The Action Plans are usually based on quarterly programmes/ projects implementation and at the end of each quarter a progress report is produced, indicating physical progress and the funds used. The progress reports are prepared by sector implementing departments and submitted to the Planning Division which, in addition to project site visits, scrutinizes the reports against Action Plans and subsequently submits the reports to the Planning Commission.

Departmental Monitoring

The second type of sector monitoring is practiced at the sector implementation level whereby an implementing division has its own mechanism of guiding sector activities from programme/project inception to project implementation. They use programme/project scheduling methods i.e. using network analysis methods (charts critical path methods - CPM), based on prioritisation and the deployment of resources.

Sector monitoring also is extended to regions by using projects' Resident Engineers (RE), and Regional Water Engineers, who implement sector programmes/projects on behalf of the Ministry (MWEM). They produce quarterly reports and at the end of the year they make annual reports.

Usually the reports are expected to be comprehensive and detailed ones, showing actual funds received, used, balances and the physical progress against the existing action plans.

The Planning Division should it feel it necessary it may organise field visits to project sites and re-evaluate physical progress

vis-a-vis existing action plans and against what implementing departments have submitted for quarter or year.

(ii) **Regional level Sector Monitoring**

Water Sector monitoring at the regional level involves the Regional Water Engineer's office, for all projects implemented by that office, under the Regional Development Director (RDD). Earlier it was noted that RWE reports to MWEM on projects funded by MWEM's Vote and thus becoming an implementing agent for MWEM. It should be mentioned here that the Regional Water Engineer does not, however, report directly to MWEM about projects implementation using Regional Development Director's Vote.

Administratively, RWE is answerable to the RDD but technically he is so to MWEM. Under the Decentralisation Policy of 1972 RWE's, like all decentralised sector's functional managers, should furnish MWEM with a copy of all sector reports prepared for RDD's without miss. This has been a very problematic area as RWE's most often do not furnish MWEM with reports for sector monitoring purposes. Thus, monitoring of regional programmes/ projects by MWEM is non existent and there are many gaps of missing data from the regions. This has also, rendered programme development co ordination very difficult and in most cases it does not exist.

(iii) **District Level Sector Monitoring**

The functional Managers at the district level are the District Water Engineers (DWE's) who are under the Local Government (Councils). They are supposed to execute district promoted projects. These are funded by the Councils themselves. DWE's are answerable to the Councils on day to day administration of their offices and sector activities. Technically, DWE's are answerable to RWE's on technical guidance. They are supposed to furnish RWE's with all sector development progress reports.

(2) **Constraints Impinging Upon Smooth Sector Monitoring**

(a) Sector monitoring is more pronounced at the national, regional and district levels but not at the Ward/village level where sector monitoring is non-existent. Thus MWEM, as a sectoral leader, does not know what is happening at the Ward/Village level, serve alone erratic reporting from RWE's. Of course there is no reporting line between MWEM and DWE's but MWEM could get reports from RWE's if reporting was done on regular basis between RWE's and DWE's and subsequently between RWE's and MWEM.

(b) Sector coordination and development monitoring is not strong between MWEM and Regions, where RWEs execute regional projects as RWE's are administratively answerable to RDD's. Likewise, sector monitoring between the regions and districts is not strong because local governments view sector coordination and monitoring by regions or MWEM as interference into their local

affairs.

(c) There's no sector development monitoring in as far as Non-Governmental Organizations (NGO's) are concerned. A big number of NGO's are involved in the sector development but very little is known. DWE's/RWE's should have been in a position to monitor sector activities but since there is nothing that binds them to do so. The vacuum is left to grow unabated.

(d) Lack of funds and logistical support makes it difficult for MWEM (Planning Division) and MWEM's Sector implementing departments to make adequate monitoring due to the nature of sector activities being pan territorial. Sometime where there are adequate funds for project monitoring the Planning Division does not have enough personnel to inspect projects.

(e) The existing institutional framework is blamed for being responsible for cumbersome monitoring task. RWE's and DWE's are under PMO's Office and the Councils respectively. This makes it difficult for the responsible line Ministry to properly co ordinate sector activities. It is also true that some ESA's are operating through district councils or PMO's Office where sector expertise lacks. This further, aggravates the problem of sector reporting and co ordination. ESA's activities are not adequately monitored, particularly in terms of technical aspects. This has got to do with equipment, and plant standardisation.

(f) There is no monitoring line between MWEM and the Ministry of Health (MoH). This is in respect to sanitation aspect. Sector co ordination also lacks between these two line Ministries. MWEM provides water and sanitation i.e. urban sewerage systems and VIP latrines in the rural areas. The monitoring aspect concerning sanitation is done by the Ministry of Health.

(3) **Future Monitoring and Recommendations**

Current sector development programmes call for establishment of strong effective monitoring system at the national, regional district and grassroot levels.

In 1991 UNICEF funded a workshop, held in Arusha[9], on Water Sector Monitoring. The key players in the water sector development are MWEM and MoH. The workshop was jointly organised by MWEM & MoH in order to work out monitoring mechanism for the sector activities. The workshop came up with some recommendations for implementation/installation. Among the recommendations the Workshop put forward were:-

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9 Workshop on Development of Water and Sanitation Monitoring System in Tanzania - REPORT AND ACTION PLAN, Joint document of the Ministry of Water, Energy and Minerals and the Ministry of Health, held on 5 - 9 August 1991 in Arusha. It was jointly funded by UNICEF and WHO.

- Establishment of Monitoring Focal Points (MFP) at Regional, District and Grassroot levels;

- Establishment of monitoring unit within MWEM to co ordinate sector development activities;

- To set up an interministerial monitoring steering committee, incorporating membership from basically water and sanitation line ministries (MWEM and MOH), and other relevant ministries and organizations to monitor the sector activities.

The newly installed system of Rolling Plan and Forward Budget (RPFB) puts more emphasis on project information for monitoring of resource expenditure.

The aim of RPFB is to integrate old planning system documents on Annual, Five Year Plans and other parallel planning documents with the objective of having one system that will satisfy the needs of objectives and targets of the various sectoral plans. To this end, monitoring system which prominently comes to picture here should be reinforced.

It is, therefore, recommended:-

(a) The recently established monitoring unit in the Planning Division of the Ministry of Water, Energy and Minerals should be strengthened - Manpower, working facilities and logistical support, as per the 1991 Arusha Monitoring Workshop recommendations.

(b) There should be a joint committee on Monitoring, composed of membership from MWEM, MoH, PMO's (Local Government), and the Ministry of Community Development Women Affairs and Children (CDWAC), whose Terms of Reference (ToR), will consist, among others, to meet on annual basis to review sector monitoring aspects as tabled by MWEM's sector Monitoring Unit, as a Secretariat.

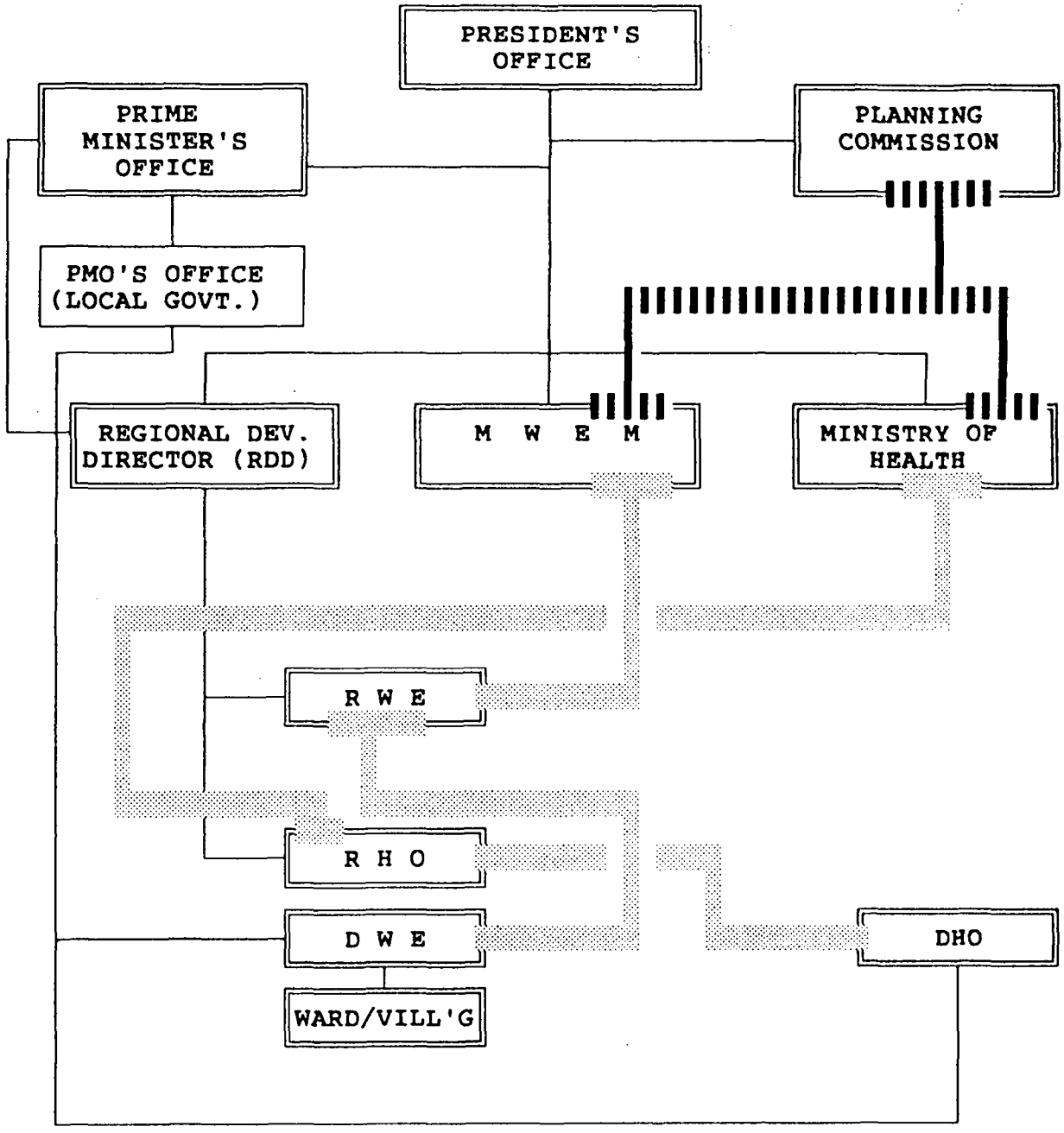
(c) Establishment of effective Monitoring Focal Points (MFP) at district, regional and national levels.

(d) MWEM and MoH should periodically collect water and sanitation data/information from regions, districts and wards/villages for proper analysis, storage and dissemination. **Appendix 2** represents a streamlined reporting relationship/system between MWEM, RWE and DWE.

APPENDIX - 1

WATER SECTOR MONITORING

Existing Sector Monitoring Process



KEY:— =Line of Answerability; |||| =Sector Reporting Line; ▒▒ =Current "Courtesy" Reporting

APPENDIX - 2

WATER SECTOR MONITORING

Desired Sector Monitoring Process