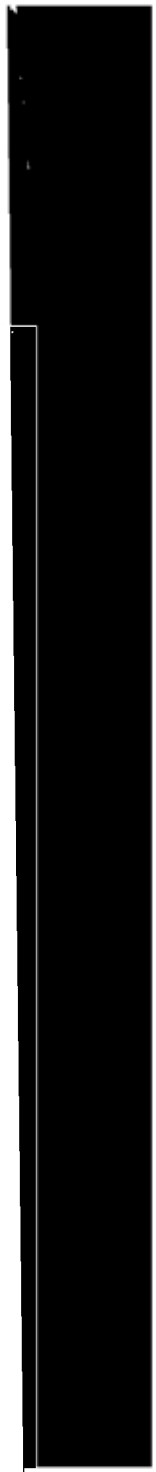

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ACRONYMS AND ABBREVIATIONS

ADB	African Development Bank
CTA	Chief Technical Adviser
DEM	Deutsche Mark (German Mark)
DWD	Department of Water Development
FIM	Finnish Mark (Markka)
FINNIDA	Finnish International Development Agency (Assistance)
GoF	Government of Finland
GoZ	Government of Zanzibar
HRD	Human resources development
IRC	International Water and Sanitation Centre
KfW	Kreditanstant fur Wiederaufbau (German Development Bank for Reconstruction and Development)
MWCELE	Ministry of Water Construction Energy Lands and Environment
NRW	Non-revenue water
O&M	Operation and maintenance
SDSWDP	Sewerage, Drainage and Solid Waste Disposal Project
UfW	Unaccounted-for water
USD	United States Dollar
UWSS	Urban Water Supply Section
ZRWSDP	Zanzibar Rural Water Supply Development Project
ZUWSP	Zanzibar Urban Water Supply Project
ZWRDP	Zanzibar Water Resources Development Project
WID	Women in development
WS	Water supply
WSS	Water supply and sanitation

1 EXECUTIVE SUMMARY

Cooperation between the Governments of Tanzania and Finland in developing the urban water supply sector in Zanzibar was started in 1989. A Water Supply Development Plan was made in 1989-1990.

Phase 1 of the Zanzibar Urban Water Supply Project was implemented from August 1991 to June 1995. The project covers improvement of water supply in Zanzibar town in Unguja island and in Wete, Chake Chake and Mkoani towns in Pemba island. Total urban population of the project area is presently about 280 000.

Due to economic difficulties in the 1970's and 1980's, adoption of unsustainable policies towards provision of "free water services" and other reasons, including insufficient institutional set-up, the situation of urban water services in Zanzibar was very poor before starting the project.

During Phase 1 emphasis was set on institutional and economic development and strengthening the organizational set-up and managerial capacity of the urban water supply institution. Technical improvements were proposed to upgrade and rehabilitate the existing water supply systems and further extend the services to previously unserved urban population. In Phase 1 the project was divided into three sub-projects: (1) Economic and Institutional Development, (2) Water Supply Development and (3) Water Resources and Environmental Development.

In Economic and Institutional Development the original expectations proved to be too optimistic compared to the actual achievements, especially concerning the time schedule of the proposed economic and institutional reforms. As a major achievement, an Urban Water Supply Section (UWSS) was formed in the beginning of Phase 1. The basic work to improve the human resources and skills of the staff, develop managerial procedures and financial status of the UWSS was carried out successfully throughout Phase 1.

The major task of gradual transformation of the UWSS to an autonomous and self-supporting Urban Water Supply Authority was not yet completed during Phase 1. Development of the policy issues and required legislation to enable official establishment of the authority was slower than anticipated. However, by the end of Phase 1, most of the required documents and groundwork for administrative decisions were completed.

The essential issue of reintroducing water charges for domestic consumers was still waiting for final approval at the end of Phase 1. Necessary paperwork had been finished, including the required legislation, regulations and tariff proposals, as well as technical arrangements for billing and revenue collection.

Human resources development and training was implemented successfully, but training needs still continue to be huge after Phase 1. Emphasis was given on managerial and technical training of key staff of the UWSS and the forthcoming water authority.

Previously almost non-existent consumer services were developed, which improved the contacts and communication between the UWSS and consumers, and also helped to minimize the previously extensive problem of illegal water connections and unauthorized and careless water use.

The achievements in Water Supply Development and in physical implementation were high and fulfilled the ambitious objectives set in the Project Document. The service level in all project towns has been improved to a level which would technically and socially justify reintroduction of domestic water charges. Earlier, the poor service level was considered a major obstacle in accepting the consumer charges.

During Phase 1 water production was increased in Zanzibar town at about 130 % and in Pemba towns at about 120 %, mainly due to rehabilitation of existing water intakes and improved utilization of the existing installations.

Rehabilitation and extension of water distribution systems was started in a larger scale in 1993. During Phase 1 new water distribution lines or major rehabilitations of pipelines were made for about 47.3 km in Zanzibar town and for about 23.1 km in Pemba towns.

Since 1994, a localized approach was started in the improvement and extension of water services and distribution system, based on the initiative and participation of the consumers and communities themselves. This approach significantly improved the consumer services, community and consumer involvement and confidence, and effectively influenced the atmosphere and attitude of the public towards a healthier and more commercial provision of water services. Through this new implementation approach possibilities for achieving success in revenue collection and cost recovery were practically improved at the community and consumer levels.

Operation and maintenance systems of the UWSS were considerably improved, and regular monitoring of the water systems was established. Leakage repair and emergency repair activities took a lot of resources. Leakage studies and water loss reduction still remain as important development areas in the future.

Workshop facilities were developed in both islands to support water supply improvements. In Pemba a new office and workshop building was constructed in 1993. In Zanzibar town workshop premises were rehabilitated in 1994, and UWSS offices were temporarily transferred from the previous rented building to the Water Department premises. However, construction of new office premises for the UWSS in Unguja should be given special attention during the proposed Phase 2 of the project.

In Water Resources and Environmental Development the actual achievements remained behind the ambitious objectives defined in the Project Document. Development of water resources legislation and overall coordination of water resources management were practically beyond the scope and resources of the project. However, the project participated in these processes with the available inputs.

Instead of extensive drilling of new production boreholes, a lot of attention was given to the rehabilitation of the existing water intakes. In respect to the pumped water quantities, this strategy proved to be successful and more economic. Drilling was done on both islands, altogether 7 production boreholes and 6 observation boreholes were drilled.

Protection of existing water sources was started. Immediate measures were taken by fencing most of the intake areas. Studies, land use plans and protection plans were made for some intakes (e.g. Mtoni spring) to facilitate long term environmental protection of the water sources. Environmental protection of the water resources was a fairly new issue in Zanzibar and it was difficult to create adequate concern and

commitment among the authorities and beneficiaries towards its importance and required action.

A water and environmental laboratory was established in Zanzibar town. Water quality monitoring was started on a regular basis. Environmental and health education was done e.g. in cooperation with other projects. UWSS participated in joint efforts to improve coordination of environmental issues in Zanzibar.

The project was implemented by the Department of Water Development. The project organization and staff were formed through secondments from DWD and by some directly employed staff in key positions. Total number of local staff of UWSS was increased from about 50 to about 170 during Phase 1. Plancenter Ltd from Finland was the consultant for the project, providing technical assistance. There were 2-8 long term advisers and 1-3 short term advisers annually working in Zanzibar. Technical assistance included total of about 330 manmonths.

Total budget for Phase 1 was FIM 52,520,000, of which the Government of Finland covered FIM 50,000,000. Total expenditure and disbursements by the end of Phase 1 (June 1995) were FIM 49,848,000 by the Government of Finland and FIM 1,220,000 (TZS 92,400,000) by the Government of Zanzibar. By the end of Phase 1 there was an outstanding balance of TZS 33,600,000 to be covered by the Government of Zanzibar.

2 BACKGROUND AND PROJECT ORIGINS

In 1989 the Government of the United Republic of Tanzania and the Government of the Republic of Finland agreed to cooperate in developing the urban water supply sector in Zanzibar. The planning phase of the project (Zanzibar Urban Water Supply Development Plan) was carried out from November 1989 to December 1990. The Development Plan provided comprehensive institutional and technical plans for urban water supply development until year 2015. Based on the Development Plan it was proposed that the First Implementation Phase (Phase 1) of the Zanzibar Urban Water Supply Project will be commenced. The Project Document for Phase 1 was completed in June 1991.

Implementation of Phase 1 started in August 1991. From January to July 1991 there was a standby-period with minimum advisory staffing and minimum project activities, to keep project organization ready for Phase 1. During the standby-period follow up of the Water Supply Development Plan was made and planning and preparation for Phase 1 was continued. Phase 1 was scheduled for the period August 1991 - December 1994. Later the time schedule and financing plan was revised, and Phase 1 was extended until June 1995.

Zanzibar Urban Water Supply Project (ZUWSP) covers improvement of water supply in Zanzibar town in Unguja island and in Wete, Chake Chake and Mkoani towns in Pemba islands. The area of Unguja and Pemba islands is 1660 km^2 and 984 km^2 respectively. Total population of Zanzibar at present is about 800 000. The population of Zanzibar town, Wete, Chake Chake and Mkoani are about 224 000, 24 000, 20 000 and 9 000 respectively. The projected population growth in the urban areas is about 3.8 % annually.

Urban water supply has got long tradition especially in Zanzibar town. Already in the beginning of the 1900's piped water supply was available in the Stone Town and its surrounding areas, using water supplied from Bububu and Mtoni spring intakes. Until late 1960's rules and regulations were in force with respect to service levels and house connections, water charges and standards for water appliances. Revenue collection system was functioning fairly well, records were kept properly and skilled staff was employed and supervised to ensure standards and good quality service.

Economic difficulties in the 1970's and 1980's, the growth in the urban population, and the declaration by the Government of Zanzibar in 1981 that "water is free" for domestic consumers, caused the urban water supply to gradually deteriorate. Erratic power supply (especially in Pemba), sub-standard piping and plumbing materials, inadequate supervision of the fundis making house connections, and illegal and unauthorized connections led to a situation whereby water supply became inadequate and unreliable.

Before commencement of the project the situation with urban water supply services was poor. Besides the factors mentioned above, ultimate reasons for poor functioning of the urban water supply services were mainly due to an insufficient institutional set-up, poor financial performance and inadequate motivation and skills, and finally as lack of appropriate water policy and legislation.

The project (ZUWSP) was designed to tackle these constraints. During Phase 1 emphasis was set on institutional and economic development and strengthening the organizational set-up and managerial capacity of the urban water supply institution.

Technical improvements were proposed to upgrade and rehabilitate the existing water supply systems and further extend the services to previously unserved urban population.

To fulfil the objectives, the project was divided in Phase 1 into three sub-projects:

- Economic and Institutional Development
- Water Supply Development
- Water Resources and Environmental Development

3 INTERVENTION EXPECTED AND ACHIEVED

3.1 Overall objectives

In the Project Document for Phase 1 (June 1991) the general development objective (**overall objective**) of the project was defined:

1) To provide beneficiaries with **safe water in a sustainable, cost-effective way with minimum of environmental risks.**

2) To provide water authorities with **institutional capability to effectively operate, manage and maintain the facilities.**

3.2 Project purpose (Development objectives)

In the Project Document (June 1991) the project purpose was defined using development objectives specified for each sub-project as follows:

Sub-project 1: Economic and institutional development

- to contribute to the development of a policy and strategy for urban water supply and achievement of improved economic efficiency
- to improve financial performance, institutional capacity and quality of human and material resources in water supply sector
- to increase involvement of consumers in the development and operation of the water supply systems
- to contribute to the sustainability of the technical improvements.

Sub-project 2: Water supply development

- to establish adequate and safe urban water supply systems appropriate to prevailing political, economic and functional conditions.

Sub-project 3: Water resources and environmental development

- to guarantee adequate share of water resources for urban water supply
- to improve environmental status of water resources
- to avoid and minimize any possible environmental deterioration due to project activities

3.3 Results (Immediate objectives)

In the Project Document (June 1991) the project results, or as by that time called as immediate objectives and outputs were defined for each sub-project and component as follows:

3.3.1 Economic and institutional development

Financial and economic development

- to develop the basic structure for the self-supporting and autonomous urban water supply organization
- to improve economy of the water supply institution through revenue collection
- to provide guidelines and policy for urban water supply

Institutional arrangements and management development

- to develop an organizational structure for operating and maintaining urban water supply systems
- to increase the capacity of the organization to develop its management and operational activities
- to create functioning relations and coordination with sewerage and drainage, health and other authorities

Human resources development

- to create abilities among the staff in handling new working tools, and to be able to adopt and develop new working methods
- to develop managerial and operational staff resources appropriate to the tasks of the urban water supply
- to upgrade the level of the urban water supply in producing and implementing human resources development plans and training programmes
- to upgrade the level of professional and vocational skills of the urban water supply institution and improve human resources

Community education and participation

- to increase the awareness and responsibility of urban inhabitants about water, health and environmental issues
- to strengthen the cooperation between different institutions on water and health issues
- to improve the consumer services

3.3.2 Water supply development

Improvement of water supply systems

- to increase volume of water by improving use of existing installations
- to improve pressure level and reliability of supply in the existing distribution system
- to improve planning of future development activities and physical improvements
- to safeguard drinking water quality from health hazards

Operation and maintenance and supporting services

- to improve sustained supply of water
- to monitor the input and output of water quantities and pressure in the network
- to carry out immediate and emergency repair works in the distribution system
- to provide basic facilities for supporting services needed for operation and maintenance of water supply systems

3.3.3 Water resources and environmental development

Water resources development

- to coordinate use of water resources
- to monitor ground water levels and water quality
- to develop data collection system for long term monitoring
- to guarantee availability of water for urban water supplies

Environmental development

Protection of water sources:

- to improve and protect environment of the existing intakes
- to guarantee that water sources meet environmental and health requirements

Environmental monitoring:

- to strengthen water monitoring capacities and to develop ground water quality monitoring programme
- to establish an environmental monitoring programme (to avoid any adverse environmental impacts due to ground water exploitation, increased waste generation, construction activities and project side-effects)

Environmental awareness:

- to improve environmental awareness

Coordination of environmental activities:

- to strengthen coordination of activities of environmental concern in cooperation with environmental, health, education, agriculture, forestry and tourism authorities

3.4 Activities and achievements

3.4.1 Economic and Institutional Development

The Project Document (June 1991) emphasized the importance of the Economic and Institutional Development sub-project. Significant achievements were expected in this respect at an early stage of Phase 1, to create a sustainable basis on which the physical improvements of water supply could be implemented. In practice the

objectives and expectations proved to be too optimistic, especially concerning the time schedule of the proposed economic and institutional reforms. Based on the experiences in the beginning of Phase 1, the implementation strategy of Phase 1 was slightly revised after the midterm review in October 1992.

Financial and economic development

Preparatory work to develop a basic structure for a self-supporting urban water supply organization was started already in 1991, but major breakthrough was not yet achieved by the end of Phase 1 (June 1995) . However, the Urban Water Supply Section (UWSS) was established already in 1991, and its organization and management structures were developed throughout Phase 1.

Development and reintroduction of water charges and revenue collection systems was expected to be done in the beginning of Phase 1. Political and administrative decisions on reintroduction of water charges for domestic water consumers were not made by the end of Phase 1. However, tariff proposals and Draft Bill for Reintroduction of Water Charges were prepared in 1995 and taken for consideration by the Zanzibari authorities.

Reintroduction of general water charges was planned and proposed for the fiscal year 1994/95, but was withdrawn from the budget session of the House of the Representatives due to unavailability of political decisions. The established Task Force prepared background documents and calculations for the real costs of urban water supply and initial tariff structures were defined. Revised tariffs for commercial and institutional consumers were introduced, but approval for applying the revised tariff was not yet obtained. Revenue billing and collection procedures and systems were studied and mobilization started. Revenue collection staff were transferred from DWD to UWSS in 1994. Two local accounts (revenue account and deposit account) were opened for UWSS in 1994 to facilitate revenue collection and administration.

Updating of the consumer registers was done both in Unguja and Pemba. Field work to collect consumer information was done in 1994 in cooperation with *shehas* (community area organizations). In Unguja about 26,680 forms and in Pemba about 5,000 forms were filled and collected. Computerization of consumer information was started, so as to establish a consumer data base with revenue billing options. By the end of Phase 1 about 4,000 consumer forms had been filed into the computer data base.

A Task Force was established in 1994 to expedite the economic and institutional reforms. The Task Force prepared background documents for water tariffs and revenue collection, and made a schedule for required process and administrative decisions to establish an urban water supply authority. As a continuation of the Task Force work, three Committees (Working Groups) were established in 1995, to develop the required background documents for further details. The Working Groups were working on the following topics:

- Water Policy
- Water Resources Legislation
- Water Works Rules and Water Tariffs

By the end of Phase 1 two of the Committees finished their task to prepare adequate draft documents (Water Policy, Water Works Rules and Water Tariffs). The work of the Water Resources Legislation Committee was not yet finished.

As part of a comprehensive financial analysis, valuation of the existing assets of the urban water supply was started in 1994 and completed in 1995. Valuation was carried out by Ardhi Institute, Dar es Salaam, but assisted by the project.

Institutional arrangements and management development

The Urban Water Supply Section (UWSS) was formed in 1991, but its official recognition and status was not obtained by the Zanzibar Government during Phase 1. The First Draft Decree for establishment of an Urban Water Supply Authority was prepared already in 1991-1992, based on an autonomous parastatal institution. However, no practical progress was achieved in respect to the actual establishment.

In 1995 a Memorandum and consequently a Cabinet Paper were prepared for the decision makers and Government to emphasize the importance of the institutional and economic reforms in the urban water supply sector. Gradual increase of operational autonomy was also called for the UWSS. Concrete action was not achieved, however.

In 1995 a new Draft Bill for the Establishment of an Urban Water Supply Authority was prepared. This was based on a public enterprise approach, which would provide flexibility and better operational autonomy in the transitional period. In the same connection a Draft Bill for Reintroduction of Domestic Water Charges was prepared. By the end of Phase 1, both bills were still for comments and consideration in the hands of the higher authorities.

Updating of the Towns' Water Works Rules (1940) was done in 1995. The proposed new water tariffs were incorporated into the rules. By the end of Phase 1 the new rules had not yet been approved by the authorities.

Preparation of the UWSS personnel policy and personnel information system was started already in 1991 and continued mainly in 1994-1995, but it still needs a lot of attention and development in future. Organization charts for UWSS were prepared and later reviewed and updated. Job descriptions with qualification requirements were prepared for the key positions.

Human resources development

Human resources development and training were ranked high in the objectives of Phase 1. In the beginning of Phase 1, the number of qualified staff seconded or employed for the project (UWSS) was low compared to the needs. Total number of staff during the first year of Phase 1 (1991) in Unguja and Pemba was about 50-70, but gradually increased to about 180 in 1994-1995. The manning ratio (employees per population served) was at the end of Phase 1 only about 1 : 1600. This is fairly low, indicating that UWSS still has shortage of qualified staff. A summary of the UWSS and project staffing during Phase 1, showing the educational background of the staff is shown in Annex 3.

Annual training plans were prepared according to the estimated actual training needs. The actual training events and programmes implemented during Phase 1 are listed in Annex 5. Higher level training for management staff of UWSS was given increased attention from 1993 onwards, to prepare for sustainable and self-supporting management of the future water authority. The feedback of the management training arranged has been very positive and the benefits are presently reflected in the actual management of the UWSS.

Besides long term management and technical training, a number of staff have participated in short term courses in Zanzibar, in the mainland Africa and abroad. Short courses are shown in Annex 5.

On-the-job training was also emphasized in most of the operational units throughout Phase 1, so as to improve technical skills, supervisory and work management. In addition, in-house training was given in computer use both in Unguja and Pemba. By the end of Phase 1, all operational units of UWSS were using computers for their daily activities, documentation of data and for reporting.

Community education and participation

Communications with the consumers and in general the consumer services have improved significantly. Direct contacts with the present and potential customers have been increased, both through strengthening the consumer services unit and through change of approach for development of water services more towards "consumer demand driven" (participatory) approach. The role of UWSS in provision and management of urban water services is all the time getting better known and recognized by the consumers and the authorities.

Community and consumer education on water and environmental issues have been channeled in different ways. The mass media (TV, radio, newspapers) have been used to distribute information and announcements about water issues. Educational material was prepared jointly with other authorities and projects and presented in TV. Meetings with communities and community leaders were arranged in several areas to inform people and to solve local problems with water supply or distribution, including illegal connections. Consumers and community leaders (*shehas*) were also mobilized and involved in the consumer registration field work carried out in both islands. Women were actively involved in consumer registration field work and in community education.

3.4.2 Water Supply Development

The water supply development sub-project was expected to be based on the revised water policies and guidelines of the Zanzibar Government and also on a clear-cut action plan outlined in the Water Supply Development Plan. Construction and rehabilitation programmes were supposed to depend on the progress of the financial, institutional and human resources development components.

Due to several reasons, the economic and institutional development components did not proceed as planned during Phase 1. Based on the recommendations of the midterm review (October 1992), increasing attention was given on the water supply development sub-project, especially on the physical improvement of the water supply

systems. Considerable improvement in the actual water supply services to the consumers was seen now as a prerequisite for achieving success also in economic and institutional development, especially in implementing cost-recovery policies and improving revenue collection. On the other hand, an effective operation and maintenance system was to be developed to ensure that the existing systems and the efforts to rehabilitate and improve them will be fully utilized.

Improvement of water supply systems

Preparation of designs, drawings and documentation of the existing and proposed future water supply systems and installations were continued from the Development Plan phase and continued throughout Phase 1. Planning and design activities were given a lot of attention during 1991-1992, to prepare for more extensive implementation to follow in 1993-1994.

Surveying and mapping of the existing water supply systems was done, but still not yet completed by the end of Phase 1.

Detailed designs for rehabilitation and improvement of water supply systems, including contract documents were made throughout Phase 1. Specifications, tendering process and procurement of construction and rehabilitation materials were carried out by the project staff.

Implementation programmes were prepared annually and partly revised for a longer design period. Implementation programmes proposed in the Water Supply Development Plan were not directly followed, due to increased information about rehabilitation priorities, revised financing and time schedule for the proposed implementation phases. In general, the annual implementation programmes during Phase 1 remained less extensive than originally proposed in the Development Plan.

Based on the poor situation before the project, increasing volume of water available by improving use of existing installations was defined as one of the main objectives. These activities were started already in the beginning of Phase 1 and were continued throughout Phase 1. Rehabilitation activities were carried out for several intakes, including cleaning of boreholes, reconstruction or rehabilitation of the well heads, installation of new pumps or motors, new starters or electrical installations etc. Details of the improvements are shown in Annex 2.

Rehabilitation of the existing water intakes has been very successful. Improvement in the water production, i.e. the water amount pumped from the intakes, has been significant and has mainly been achieved by improving use of existing installations after major rehabilitation. Water production has increased in Unguja between 1990-1994 at about 130 % (from 13,000 to 30,000 m^3/d) and in Pemba between 1990-1994 at about 120 % (from 2,000 to 4,400 m^3/d) (Annex 6).

New water intakes have also been developed during Phase 1, although the emphasis was still in rehabilitation of the existing intakes. One new borehole intake in Mwembe Mchomeke (U-019) was completed in 1994, including the pumping main. Utilization of

the intake was still pending, because the electricity supply to the intake was not yet completed. Another production borehole in Chunga (U-026) was drilled in 1995, but was not yet taken in use. In Pemba one new production borehole in Ngombeni, Mkoani (PM-512) started to operate in June 1995 and another in Makombeni (PM-516) was drilled in 1995, but was still unused during the reporting time. (Annex 2).

Rehabilitation and extension of water distribution systems was started in a larger scale in 1993. In the beginning of Phase 1 it was necessary to collect more information about the existing pipelines and operation of the distribution system, before entering into an extensive rehabilitation programme. Also more information was obtained about the condition of the existing distribution system (especially leakages) along with increased water production. As the existing pipelines and operation of the distribution system is not yet fully known, collection of data and information related to them is considered to be a continuous process.

Reconstruction, rehabilitation and extension of the water distribution systems was carried out with two parallel approaches and strategies. Rehabilitation programme for the strategic main distribution lines was continued in all project towns according to the long term plans, which have slightly been adjusted according to the recent data from network operation monitoring etc. In Zanzibar Town this systematic rehabilitation and reconstruction programme was concentrated mainly in Mwanakwerekwe and Mombasa residential areas and in Jangombe and Kwamtipura areas. Improvement and rehabilitation of water distribution system in the Stone Town was also started in 1994.

Since 1994, a localized approach has been applied in the improvement and extension of the water services and distribution system, based on the initiative of the consumers and communities themselves. Consumers have been encouraged to contact the UWSS office with their water problems and to give their local knowledge and ideas for the planning and implementation. This "consumer demand driven (participatory) approach" has proved to be successful in many ways. It has helped the project to select the areas with actual supply problems and to prioritize their rehabilitation. More importantly the participatory approach makes the consumers extremely committed to improving their systems, as they are often ready to contribute by collecting funds or providing labour force for implementation. In many areas water committees have been established for this purpose, and the committees have willingness and systems for fund raising and revenue collection.

This new strategy has responded well to the recommendations given in the midterm review about incorporating "social mapping" to prioritize areas of biggest need to improve water supply services. The experiences also show that it has significantly improved the confidence of the consumers and politicians toward the project, improved the community awareness and participation, and willingness to pay for the improved water services.

During Phase 1 approximately the following total length of water pipelines was rehabilitated and constructed (details are shown in Annex 2):

-	Unguja	1991 - 1995	total about	47.3 km
-	Pemba	1991 - 1995	total about	23.1 km
-	Total	1991 - 1995	about	70.4 km

In physical improvement of water supply systems most of the objectives set in the Project Document (June 1991) and in Annual Work Plans were met. One exception is

replacement of the deteriorated and leaking elevated water reservoir in Mtemani, Wete, which was not done. The costs of the rehabilitation were found to be too high compared to the available funds. Therefore, this work was postponed to Phase 2 of the project. Rehabilitation of Welezo and Saateni water reservoirs will also be postponed to a later stage.

Operation and maintenance and supporting services

Physical improvements were made also to improve monitoring and operation and maintenance of the water supply systems. A systematic programme was started in 1993 to construct valve chambers at the intakes and in the distribution system to make operation and maintenance easier and more effective. Altogether more than 120 new valve chambers have been constructed.

Water meters were installed into the system to monitor flow in the network, as well as for large water consumers to facilitate revenue collection based on the actual water consumption. The programme to install water meters for major consumers was started, but was not implemented as effectively as expected. This was mainly caused by the heavy workload of the operation and maintenance staff, mainly due to emergency and leakage repairs.

A monitoring system was established for the water intakes and pumping stations. Weekly records were kept on the pumped water quantities, power consumption, pressure readings, running hours etc. Documentation and presentation methods of the intake operation records have been improved, based on the computerized system. About 20 continuously monitoring pressure recorders have been installed in the water distribution system in Zanzibar town, to follow up variation of distribution pressure. The graph papers for the recorders are changed once a week. Continuous pressure monitoring has proved to be extremely useful in getting actual information on the operation of the system and needs for future improvements. In addition to continuous pressure monitoring, monthly pressure observations have been done in about 15 different locations.

Flow measurements have been done occasionally at the water intakes to check the readings of the water meters, and in selected points of the water distribution system.

Leakage repairs have been done in the water distribution system both in Zanzibar town and in Pemba already since 1991, but largely on an *ad hoc* basis, based on the leakage reports received or occasional visual observations. Attempts have been made to develop systematic and comprehensive leakage surveys and detection programmes, but the resources have been too inadequate. In 1994 systematic leakage studies were made in selected pilot areas in Zanzibar Stone Town, mainly based on district metering and pressure observations.

A water loss reduction strategy was prepared in 1994, including both technical and institutional issues of water loss control. The strategy was used to develop procedures for leakage repair and control. A more practical and comprehensive water loss control programme still needs to be prepared based on this strategy.

Monitoring and control procedures for water intakes and distribution network were further developed and reporting and documenting systems improved. Operation and

maintenance manuals were further developed for water systems in Unguja. Operation instructions in Kiswahili and English were prepared for all water intakes.

Emergency reporting and repair systems were improved, but they still need to be strengthened further to be adequately functionable. In 1995 the system of having *stand-by fundis* available for emergency repairs during the weekends and holidays was started. Transport arrangements were made to improve mobilization of the emergency maintenance and repair staff.

Rehabilitation of the new project workshop facilities in Saateni was done in 1994. By the end of Phase 1 the physical workshop facilities were practically completed, but the workshop and stores management procedures still need to be developed. This work was started in 1994. Transfer of material stores to the workshop area was completed in 1995.

In Pemba (Chake Chake) new workshop premises were established at the constructed Machomane office area in 1993. Further development and arrangement of the workshop facilities was continued until the end of Phase 1.

In Pemba the project and the Urban Water Supply Section was operating in sustainable office premises since 1993. In Unguja the Section was operating in rented premises in Maisara until June 1995, but by the end of Phase 1 it moved into the DWD premises in Mabluu, where modest but functionable office premises were rehabilitated.

3.4.3 Water Resources and Environmental Development

The project was given an ambitious objective of coordinating use of water resources, especially ground water development in Zanzibar. However, development of water resources management systems during Phase 1 was mainly concentrating in routine monitoring and drilling activities. ZUWSP worked in cooperation with DWD and the Zanzibar Water Resources Development Project (ZWRDP) in this area.

The original objective of the project (ZUWSP) developing comprehensive water resources management system for the entire country, covering all water related subsectors, was considered unrealistic compared to the available resources. Development of water resources legislation and establishment of the proposed Water Resources Management Unit (WRMU) will be an important joint future objective for DWD and all water sector projects.

Water resources development

Rehabilitation and cleaning of the existing borehole intakes was given a lot of attention throughout Phase 1. Especially the boreholes in Kaburi Kikombe area (4 nos) in Unguja and in Changaweni area (3 nos) in Pemba caused a lot of problems and cleaning needs.

Drilling was carried out in both islands, with one rig (Dando) in Unguja and one (Ruston) in Pemba. In Unguja the drilling programme was started in 1992, when one production borehole was drilled in Kijito Upele area. However, this borehole was not very productive and it was reserved for rural water supply. Between 1993 and 1995

two more production boreholes were drilled in Unguja (Mwembe Mchomeke and Chunga), but both of them were not yet in use by the end of Phase 1. In addition, five observation boreholes and two production boreholes (for irrigation and rural water supply) were drilled in Unguja.

In Pemba drilling was started only in 1994. By the end of Phase 1, one observation borehole and two production boreholes were drilled in Mkoani town. One production borehole was taken in use in 1995. Detailed drilling programme is shown in Annex 2.

As a whole, the drilling programme implemented during Phase 1 was much less extensive than originally proposed in the Water Supply Development Plan. A number of problems were met in the implementation of the drilling programme and its time schedule. On the other hand, the quantity of water pumped into the network was still increased significantly, due to intensive rehabilitation of the existing water intakes and pump installations.

Future drilling programmes were reviewed and geophysical investigations were made to verify the proposed future drilling sites.

Monitoring of ground water levels and quality was done in both islands. Data bases for water resources monitoring were developed in cooperation with the Zanzibar Water Resources Development Project (ZWRDP).

Environmental development

The project was expected to have wide environmental effects and improvements, dealing with protection of water sources, environmental monitoring, environmental awareness and coordination of environmental activities in general. A lot has been achieved within the project during Phase 1, but many of the objectives realistically fell beyond the scope and resources of the project. During Phase 1 fruitful cooperation has been established with the new Department of the Environment.

Protection of water sources

Fencing of water intake areas was done both in Unguja and Pemba, to protect the immediate surrounding of the intakes. This was the first short term action towards appropriate protection zoning of water intakes. Surveying of water intake areas was done to allow protection zoning in future.

Particular water source protection activities were commenced in Mtoni and Gawani spring areas in Unguja and Pemba respectively. In 1993 a study was made by a sub-consultant on the land use and vegetation changes within Mtoni spring catchment area. Consequently, a resettling plan was made in 1994 for people living in Mtoni spring area and a replacement area was allocated and surveyed, but people were not yet moved from the area by the end of Phase 1. In Gawani area in Wete a forestation programme was commenced to control erosion problems.

Some progress was achieved in water source protection, but e.g. the final solution for protecting Mtoni spring area was not yet achieved. Uncontrolled land use and construction are causing more and more risks and problems for water sources and

also for distribution networks. Water source protection can not be properly managed until comprehensive water resources legislation will be prepared and enforced.

Environmental monitoring

A water and environmental laboratory was established in 1993 at Saateni pumping station area in Zanzibar town. The laboratory was equipped with adequate facilities for physical, chemical and bacteriological water and wastewater analyses.

Monitoring system for ground water quality and network water quality was established and monitoring was done on a regular basis.

Water quality and environmental monitoring activities were reviewed by two annual consultation visits by a short term consultant (in 1993 and 1994). Laboratory staff were given on-the-job training and some improvements were made for the laboratory facilities and services. Preparations were also made to develop the laboratory services more commercially available for other projects and individuals.

An environmental assessment was done in 1992 by a short term Environmental Specialist.

Environmental awareness and Coordination of environmental activities

Information spots in mass media, community meetings and educational occasions with community leaders were arranged on water, environment and health issues.

The project participated in Task Force work on environmental issues and had cooperation with other projects and authorities in environmental and health education issues. Water and health education material was prepared in cooperation with the KfW financed Sewerage, Drainage and Solid Waste Disposal Project.

4 ASSUMPTIONS

4.1 Assumptions at different level

According to the Project Document (June 1991) "the progress of the project as a whole depends on the progress of the institutional and legislative development. The basic strategy for achieving the self-sustainability of the urban water organization is a threefold process of (1) creating external preconditions (legal and financial basis for operation), (2) improving institutional performance (showing results) and (3) training".

The institutional reforms expected by the Government of Zanzibar during Phase 1 to facilitate appropriate financial and legal basis for the operation of the urban water supply institution were scheduled in the Project Document (June 1991) and *actual achievements* are as follows:

By the end of the year 1991:

- "The Urban Water Supply Section (UWSS) has been formed within the Department of Water Development". *The Section (UWSS) was established and formed in 1991, and developed gradually throughout Phase 1.*

- "Proposals for a decree to establish Zanzibar Urban Water Supply Authority and Ground Water Ordinance have been submitted to the political decision makers". *First Drafts of the documents were prepared by the project in 1991-1992, but they were not processed up to political decision making. In 1995 improved and updated drafts were prepared for the required legislation.*

By the end of the year 1992:

- "Administrative preparations have been completed for the UWSS to function autonomously on a trial basis". *No administrative decisions on the autonomy of the UWSS were made during Phase 1, but in practice the UWSS maintained certain level of autonomy especially in financial management of the project funds.*

By the end of the year 1993:

- "The UWSS has readiness and right to master its own account and to charge for its services". *The UWSS got its own accounts (revenue account and deposit account) in 1994. UWSS was able to charge for its services for installing water connections (labour charges and materials), and revenue was collected from industrial and commercial consumers (but not retained by UWSS).*

- "Relations between the UWSS and beneficiaries as well as the rights and responsibilities have been defined in the Water Works Rules". *Old Towns Water Works Rules were still officially enforced but not followed in practice. The rules were updated and amended in 1994-1995, but not yet officially approved by the authorities by the end of Phase 1.*

By the end of 1994:

- "The UWSS has readiness to start functioning as an Urban Water Supply Body and possess legal basis for its operation". *Internal arrangements within the*

UWSS were practically ready (with an exception of non-existence of a nominated Manager of UWSS) by the end of Phase 1. The legal basis for operation of the UWSS was not yet approved by the authorities.

Although progress was achieved in the administrative preparations and decisions on the long-term institutional reforms, the original time schedule of the reforms was delayed. There seemed not yet to be political preparedness to approve the major policy changes and institutional reforms.

Towards the end of Phase 1 the policy environment gradually changed more favourable. In 1995 the National Water Policy was drafted, although not yet approved. The reactions of the authorities and decision makers seemed to be favourable and encouraging for future implementation of the new policy which is fully supportive to the reforms stated in the project objectives.

Partly the delays in institutional development were caused by unavoidable circumstances due to delay in commencing the Institutional Support consultancy of the ADB financed Rural Water Supply Project. Institutional development was in 1992 recommended to be done in coordination with the Rural Water Supply Project (ADB) and the Sewerage, Drainage and Solid Waste Disposal Project (KfW). This institutional consultancy had not yet started by the end of Phase 1, although scheduled already for 1993-1994.

4.2 Risks and flexibility

Official approval of the new water policy and the proposed organizational structure of an autonomous water authority is yet to take place and it is crucial for the sustainability of the entire process. The risks of difficulties and delays in obtaining official approval of the reforms at the policy level and the commitment of the decision makers to achieve the administrative decisions according to the agreed schedule were known at the beginning of Phase 1, but still the objectives seemed to be too optimistic concerning the timing.

Towards the end of Phase 1 the policy environment and preparedness to accept the reforms improved significantly. The main factor delaying the final approval of the essential reforms (institutional changes, reintroduction of domestic water charges etc.) in 1994-1995 was associated with the political situation which seems to be uncertain before the forthcoming elections (October 1995). Most important institutional and economic decisions seemed to remain postponed over the elections.

Other risks and external factors were mentioned in the Project Document (June 1991). Some of them had an effect on the project implementation:

- In the beginning of Phase 1 some delays were met with procurement of materials, and also difficulties were met in transportation of materials between Dar es Salaam and Zanzibar, and between Zanzibar and Pemba. Also difficulties were met with customs clearance of the materials in the beginning of Phase 1.

- Problems with power supply were affecting the implementation and operation of the water supply systems especially in Pemba. The situation was improved in 1994 but not satisfactorily.

- Inadequacy of staff for training was noticed as an actual problem. Scarcity of potential staff for management training affected the project. On the other hand the training arranged already had positive impact on the actual management of the UWSS, and all staff receiving higher level training remained working with the UWSS after training.

- Availability of adequately skilled local contractors was questioned, but actually the project did not face big difficulties to find adequately skilled local contractors for civil and pipeline works. The project in fact was improving the local contractors' skills and experience in contracting works and especially in contract procedures.

In addition to above mentioned risks and external factors, availability of local component funds for the project was difficult throughout Phase 1. Disbursements were delayed and lagging behind the agreed schedule. At the end of Phase 1, there was still an outstanding balance of TZS 33.6 million of local component (Annex 7).

The lack of proper water policy and effective regulations and procedures for urban water supply issues, and especially lack of effective enforcing and control mechanisms, continuously caused difficulties for the project and UWSS to run and develop the services successfully. Illegal connections, illegal and careless water use were still much beyond the control of the project. The procedures to deal with these problems were developed, but the field and extent of problems and disorganization are so huge that it will take a considerably long time to get them under control. This long culture and history of mismanagement and disorder is, however, not at all unique only to water sector in Zanzibar, but it concerns most of the infrastructure and social sectors. Another field which also caused problems to development of water supply is uncontrolled land use and construction.

As a consequence of long period of poor management and operation, common and frequent unexpected problems and failures within the water supply systems have required a lot of resources and attention which is difficult to plan and forecast in advance. These unexpected and emergency activities have often caused difficulties to maintain pace with the originally planned activities. This has actually not been a significant problem for the actual implementation of the project, but describes the unique nature of this kind of infrastructure rehabilitation and development project, which calls for a certain flexibility and experience not only in planning the activities but also in evaluation of the achievements.

In environmental protection of water resources the legislation and the concerned implementing institutions have not yet developed to cope with the new situation. This caused further delays in practical implementation of water protection activities of e.g. Mtoni spring area.

5 IMPLEMENTATION OF PHASE 1

5.1 Human resources and staffing

Core staff of the project and the established Urban Water Supply Section (UWSS) was established by secondments from DWD. Some key positions have been staffed by directly employed personnel. Full details of the Zanzibari staff are given in Annex 3. The average number of local staff during Phase 1 has been as shown in Table 1.

Table 1. Zanzibari personnel of ZUWSP and UWSS during Phase 1.

	1991	1992	1993	1994	1995	Average
Unguja						
Seconded (DWD)	14-22	35-63	75	85	97	68
Directly employed	22-29	33-56	24	28	24	32
Total	**36-51**	**68-119**	**89**	**113**	**121**	**87**
Pemba						
Seconded (DWD)	5-7	9-16	20	40	24	21
Directly employed	4-10	10-16	16	19	37	20
Total	**9-17**	**19-32**	**36**	**59**	**61**	**41**
Unguja and Pemba Total	**48-69**	**87-151**	**115**	**172**	**182**	**129**

The number of expatriate advisory staff during Phase 1 has varied between 2 and 8 long-term advisers and 1-3 short-term advisers annually, as shown in Table 2.

Table 2. Expatriate advisory staff during Phase 1.

	1991	1992	1993	1994	1995	Average
Long-term	3-5	6-7	6-8	5-8	2-4	6
Short-term	2	5	3	2	1	2

Details of the expatriate advisory staff, including their duration of contract, are shown in Annex 4. Total amount of expatriate adviser manmonths in Zanzibar were about 287 and total amount of consultant's home office back-up manmonths about 40.

5.2 Materials and other inputs

During Phase 1 an extensive amount of project materials were procured for the project. These include construction materials, machineries and equipment for pumping stations and workshop, project vehicles, pipe materials and fittings, office materials and equipment etc. The value of material supply during Phase 1 was total about FIM 25 million (about 50 % of the total GoF financing).

The project materials and equipment in use and in stock at the end of Phase 1 have been documented in inventory reports kept by the project. The assets of the project and the Urban Water Supply Section have also been documented in asset valuation reports (Unguja and Pemba), prepared in cooperation by Ardhi Institute and the project in 1995.

UWSS Unguja (ZUWSP) got its own workshop premises in Saateni area in 1994 when an existing godown of the Ministry of Communication and Transport was rehabilitated for the project. The plot and the godown were obtained as a result of a plot exchange agreement between MWCELE and Ministry of Communication and Transport.

In 1995 the project (UWSS Unguja) moved from the rented office premises in Maisara to DWD premises in Mabluu. Reasonable office facilities were obtained for UWSS by rehabilitating some existing DWD office and storage rooms.

In Pemba new office and workshop facilities were constructed in 1993 in Machomane area. The new premises provide sustainable facilities for UWSS operations in future.

5.3 Costs and financing

According to the Project Document (June 1991) the budget for Phase 1 was as follows:

Table 3. Project budget for Phase 1 (1991-1994) as given in the Project Document (in 1000 FIM).

	1991	1992	1993	1994	Total
Government of Finland	6,000	13,000	16,000	15,000	50,000
Government of Zanzibar	630	630	630	630	2,520
Total	**6,630**	**13,630**	**16,630**	**15,630**	**52,520**

The actual financing and disbursement of costs was as follows:

Table 4. Actual financing of Phase 1 (1991-1995) (in 1000 FIM).

	1991	1992	1993	1994	1995	Total
Government of Finland (1000 FIM)	6,008	13,800	12,445	14,500	3,095	49,848
Government of (MTZS)	(25)	(20.4)	(2)	(15)	(30)	(92.4)
Zanzibar (1000 FIM)	481	323	26	143	247	1,220
Total	**6,489**	**14,123**	**12,471**	**14,643**	**3,342**	**51,068**

Local financing by the Government of Zanzibar (Local Component) was originally calculated to be 10 % of total investment and procurement costs or 5 % of total project costs. According to the Project Document (June 1991) total Local Component was agreed as TZS 126 million (equivalent to FIM 2,520,000 in 1991). However, the Local Component share was not bound to an index, and its actual value during Phase 1 was considerably lower. For instance, in 1994, the annual Local Component allocation was calculated only as FIM 390,000. (Annex 7).

The budget structure and cost monitoring system was revised in 1994. The revised system provided more consistent follow up of the expenditure of each sub-project. In the following table a breakdown of the project expenditure for each sub-project and cost centre is given.

Table 5. Breakdown of project expenditure (GoF financing) in Phase 1 (1991-1995) (in 1000 FIM).

	1991	1992	1993	1994	1995	Total
Technical Assistance	3,125	4,476	5,329	5,533	1,814	20,277
Economic and Institutional Develop.	608	844	600	495	131	2,678
Water Supply Develop.	1,400	7,100	5,045	6,707	454	20,706
Water Resources and Env. Development	500	900	800	453	247	2,900
Workshop and Stores	175	180	220	517	200	1,292
Administration	200	300	451	795	249	1,995
Total	**6,008**	**13,800**	**12,445**	**14,500**	**3,095**	**49,848**

The difference between the budgeted Government of Finland financing (FIM 50 million) and the actual expenditure spent by the end of June 1995 (excess balance of about FIM 152 000) was transferred to be used during the Standby Period starting from July 1995.

5.4 Timetable

Phase 1 was originally scheduled for a period of 48 months, from 1 January 1991 to 31 December 1994. Actual commencement was in August 1991, and later Phase 1 was extended up to end of June 1995. Total duration was 47 months.

Delay in the commencement date was mainly due to adjustments in the financing arrangements and administrative process of finishing the agreement. Extension of the original completion date was mainly caused by rescheduling the GoF financing in 1993-1994.

5.5 Implementation procedures and institutional framework

The competent authorities of the two Governments for the implementation of Phase 1 of the project were the Ministry for Foreign Affairs of Finland, represented in Finland by the Department for International Development Cooperation (previously Finnish International Development Agency, FINNIDA), and the Ministry of Finance, Tanzania and the Ministry of Finance, Zanzibar.

The implementing agency was the Ministry of Water Construction Energy Lands and Environment, Zanzibar. The executing agency was the Department of Water Development, Zanzibar.

Plancenter Ltd from Finland was the consultant providing technical assistance and advisory support to the implementing and executing agencies in project implementation.

Other participating and collaborating institutions and organizations were mainly as described in the Project Document. Extensive cooperation was maintained with other development projects in the water sector (ZRWSDP, ZWRDP, SDSWDP etc.).

Project implementation was guided and supervised by the Steering Committee. The Steering Committee had representatives from the competent authorities, implementing agency, executing agency, other Zanzibari authorities, project and consultant.

The project was implemented within the framework of the Urban Water Supply Section (UWSS), which was established at the beginning of Phase 1. The staffing of the UWSS consisted of employees seconded from DWD, directly employed staff and the consultant. UWSS has institutionally been an integral part of DWD. The Director of DWD has been ultimately in charge of the management and administration of the UWSS, assisted and advised by the Project Coordinator (Chief Technical Adviser). Financially UWSS has enjoyed a reasonably high degree of autonomy, especially concerning the donor finance.

In practical project implementation the UWSS (assisted by the Consultant) has carried out most of the activities with their own staff (including administration, finance, planning and design, operation and maintenance and part of construction activities). Local contractors have been employed for major construction and rehabilitation works. Sub-consultants and other suppliers have been occasionally employed for special services.

6 PROGRESS TOWARDS SUSTAINABILITY

6.1 Policy support

The original target was to achieve significant progress in economic and institutional development in the beginning of Phase 1, before launching extensive rehabilitation programmes. Strong policy support by the Government was expected. However, the policy development was fairly modest during almost the entire Phase 1.

In 1995 increased efforts were made in policy development. As a result of extensive committee and subconsultancy work a number of policy related documents were prepared. A National Water Policy was drafted, but not yet officially approved by the Government. Drafts of required legislation for economic and institutional reforms were prepared, but not yet finally introduced for decision making bodies.

The new water policy is fully supportive to establishment of an autonomous water supply authority, appropriate cost recovery policies, reintroduction of water charges to all consumer categories etc. The related legislation will provide the institutional and legal framework for implementing the reforms in practice. These reforms will aim at long term sustainability of the urban water supply sector.

Although the new water policy was not yet approved during Phase 1, the Government of Zanzibar gave increased priority in its official statements and budget speeches to the development of public utilities and services, including water supply and sanitation. Cost sharing and cost recovery policies have often been mentioned, but concrete decisions to implement new policies have not yet been made.

6.2 Appropriate technology

Mainly during 1994 the project started to apply new consumer demand driven strategy in implementation of water supply services to new and unserved urban areas. The new strategy has significantly improved the commitment of the community and consumers to development of their water supply services, including cost sharing. Implementation procedures have involved the beneficiaries strongly and have made implementation cost effective, using appropriate technology.

Before commencement of the project, technically sub-standard materials were commonly used to maintain and extend the water supply systems. This was caused by severe lack of foreign currency and consequently lack of appropriate water supply materials and equipment. During Phase 1 of the project technically high quality and appropriate materials and equipment were used, which has improved the sustainability of the systems.

6.3 Environmental protection measures

Environmental issues have been assessed and used as basic criteria while locating the sites for new boreholes, buildings and treatment units and while selecting the technologies. Protection of the urban water sources and resources against environmental pollution and degradation was considered as an important objective during Phase 1. Practical results of the water source protection efforts remained unsatisfactory, and measures took much more time than was planned. The reasons

can be found in the absence of comprehensive water resources and environmental legislation, especially their enforcement mechanisms, and also in the attitudes of the authorities and decision makers towards these reasonably new environmental concerns. Gradual improvement in the awareness was achieved, however.

Besides its acute protection needs, the case of the Mtoni spring was used as a pilot programme to demonstrate the future needs of securing the valuable water sources and planning appropriate protection measures. The experiences will prove useful in further development of the legislation and regulations on the water resources.

Improvement of water services and availability of water usually needs to be complemented by adequate environmental and health education to the beneficiaries. The project has recognized this need and has implemented consumer awareness programmes and health education campaigns and materials, in close cooperation with the Sewerage, Drainage and Solid Waste Disposal Project (financed by KfW).

6.4 Institutional and management capacity

One of the main general objectives of the project was defined "to provide water authorities with institutional capability to effectively operate, manage and maintain the facilities". Institutional capacity was to be improved by developing a proper policy and strategy for urban water supply, and by implementing the policy at the project level as well as at national level.

The institutional prerequisites defined to achieve progress towards the goals were (1) establishment of an autonomous entity (authority) for urban water supply and (2) establishment of a coordinating body for the utilization of water resources (eg. Water Board). "Providing the urban water organization with the necessary management authority, financial independence and legal basis for its operation is the responsibility of the political bodies and authorities in Zanzibar. The role of the project is that of contributing by participating in preparatory work in committees and drafting proposals and estimates with local experts and officials in charge. The decision making responsibility lies with the Zanzibari authorities". (Project Document, June 1991).

During Phase 1 no administrative decisions were made about the establishment of an autonomous water authority or about the coordinating body for utilization of water resources (Water Board). Lack of decisions by the Zanzibari authorities was a clear drawback concerning the aims and progress towards long term sustainability of the urban water sector.

However, within the project itself, encouraging results were achieved in developing the institutional capacity. Establishment of the Urban Water Supply Section (UWSS) and development of its management capacity and staffing was a significant step towards the ultimate goal. This was assumed at the beginning of Phase 1. In 1995 the UWSS's activities were transferred and integrated fully into the DWD as an autonomous cost centre. This approach in the transitional institutional arrangements was needed because the UWSS had not yet been given any official status by the Government of Zanzibar, and therefore its financial and institutional status could not be adequately improved, unless being an integral part of DWD operationally.

By the end of Phase 1 the groundwork was practically completed to obtain official administrative decision to establish the autonomous Urban Water Supply Authority as

a public enterprise. The required legislation was drafted, but not approved. The delay is linked to the political situation which seems to be uncertain until the October 1995 elections.

Preparations for the establishment of the Water Board were not as advanced, as the water resources legislation as a whole was not yet ready. Preparation of the new Water Policy in 1995 was a good indication of development, providing policy guidelines for the Water Board as well as for the water authority.

Management capacity within the UWSS was improved successfully, and it may well be stated that the objectives of Phase 1 in that connection were fulfilled. Training of management staff and technical staff of UWSS was implemented according to the plans and impacts of the training were already reflected in the management and daily operation of the UWSS. Human resources of the UWSS are still limited, and training during Phase 1 could have been more extensive if wider base of staff to be trained would have been available.

At the top management level of the UWSS the progress towards sustainability has not yet been achieved satisfactorily. In Pemba the UWSS unit has a competent manager, who was trained abroad during Phase 1. In Unguja the UWSS still lacks a Zanzibari manager at the end of Phase 1. The (Acting) Director of DWD was having the ultimate management responsibility on the UWSS matters, but his capacity and time reserved for UWSS were too limited, knowing the huge tasks of the DWD. On the other hand, the (previous) Director of DWD was still abroad for his MSc training at the end of Phase 1.

Management of the UWSS operations at the daily level were significantly improved during Phase 1, but partly the long mismanagement traditions of the DWD were still disturbing the activities. Work and supervision management of the working groups e.g. in operation and maintenance unit were improved to a satisfactory level. Consumer services were reorganized and developed to cope with the future needs of billing and revenue collection.

Involvement and capacity of the private sector in development of urban water supply was created during Phase 1, being previously practically non-existent. Local material suppliers were involved and also trained in their role and responsibilities. Local contractors were involved in rehabilitation and construction of water intakes and distribution systems. Contract administration and management procedures were made familiar to many contractors, whose systems previously were still fairly underdeveloped.

6.6 Economic and financial analysis

According to the Project Document (June 1991) one of the development objectives of the Economic and Institutional Development was to improve financial performance of the urban water supply organization. The Financial and Economic Development component was supposed to develop the basic structure of an economically self-reliant water authority, to study and develop its accounting and financial control systems and to develop the billing and revenue collection systems.

The financial performance of the water authority (Department of Water Development and the Urban Water Supply Section) did not adequately improve during Phase 1. The

main drawback has been delay in obtaining approval for the reintroduction of domestic water charges. The actual water revenue income by the DWD from commercial consumers was about TZS 6 million annually (Table 6).

Table 6. Revenue collected from industrial and commercial consumers 1991 -1995.

Period	Collected revenue (TZS
July 1991 - June 1992	2.132.437,50
July 1992 - June 1993	6.000.000,00
July 1993 - June 1994	6.069.704,15
July 1994 - June 1995	6.305.705,00
Total	**20.507.891,65**

The collected revenue was fully returned to the Ministry of Finance. The project and DWD requested the Ministry of Finance to allow the UWSS (or DWD) to retain even part of the revenue to be used directly for urban water supply purposes, but the request was rejected. However, the UWSS used the revenue from installation of new house connections (labour charges and sales of materials) directly for water supply improvements.

The water tariffs applied for industrial and commercial consumers and the annual revenue collected during Phase 1 were much too low compared to the actual costs of supplying water to the urban areas. They covered only 2-3 % of the annual operation and maintenance costs of the urban water supply systems. Over 90 % of the collected revenue came from Zanzibar town and less than 10 % from Pemba.

Calculations on the real costs of producing and supplying water to urban consumers were done in 1993-1994. Based on these rough calculations, revision for industrial and commercial tariffs and an initial tariff proposal for domestic consumers were made. However, the revised tariffs were not yet officially approved, but new tariffs were applied for new consumers like new tourist hotels. The proposed domestic water tariff to allow full cost recovery was 200 TZS/m^3. However, the Task Force recommended a lower figure of minimum TZS 500 per connection (household) to be used as an initial tariff value when the water charges for domestic consumers would be reintroduced.

In 1995 tariff studies were continued, with more accurate calculations. Also detailed tariff calculations and a comprehensive financial analysis were included in the MSc thesis of the Executive Engineer (UWSS Manager) in Pemba in 1995. This analysis included also a field survey in Pemba on the willingness and affordability of the urban consumers to pay for water services. When compared to the household survey done during the planning phase, the consumers' willingness to pay for improved water services seems to have increased considerably during Phase 1.

The financial performance of the project can partly be assessed by calculating the unit costs of improving the water services to the consumers. During Phase 1, the total

expenditure was about FIM 50 million. If the population of the project area is estimated to be about 280 000 inhabitants, total expenditure (including technical assistance costs) of the project is equal to USD 40 per capita or about FIM 180 per beneficiary. The investment costs during Phase 1 were on an average about USD 20 per capita. These figures are competitive, if compared to construction of completely new systems of a similar type, which may easily cost about USD 100 /cap.

The pending or outstanding local component payment at the end of Phase 1 (June 1995) was about TZS 33.6 million, which is equivalent to about FIM 230 000. There have been difficulties in obtaining the local financing throughout Phase 1, which has reflected the poor financial situation of the Government of Zanzibar. On the other hand, it clearly shows the importance of the reform to establish an autonomous water authority which can also decide on its financing strategies and set tariffs to enable self-supporting operation. Total dependence on government subsidies and donor finance is absolutely not sustainable.

7 REPORTING, MONITORING AND EVALUATION

Reporting

Reporting system followed the GoF instructions and specifications given in the Project Document. The following reports are available to review the project progress :

- Annual Work Plans (1991-1995)
- Annual Progress Reports (1991-1994)
- Monthly Progress Reports
- Quarterly Financial Reports (since 1994)
- Monthly Expenditure Reports

Steering Committee

Project implementation was guided and supervised by the Steering Committee. The Steering Committee had representatives from the competent authorities, implementing agency, executing agency, other Zanzibari authorities, project and consultant. Members of the Steering Committee are named in the minutes of the Steering Committee (Annex 8).

The Steering Committee usually had 1-2 meetings annually. Annual Work Plans were reviewed and approved by the Steering Committee.

Midterm review

The midterm review of Phase 1 was carried out on 7-15 October 1992. Members of the midterm review team were:

Mr Han Heijnen	Sanitary Engineer and Team Leader (IRC)
Ms Madeleen Wegelin	Sociologist and Urban Development Expert (IRC)
Dr Hemed Rashid Hikmany	Commissioner, Ministry of Finance (Zanzibar)

The foreign members of the team were from International Water and Sanitation Centre (IRC), The Hague, The Netherlands.

The midterm review recommended continuation of Phase 1 with an emphasis on the water production to facilitate revenue collection from the beneficiaries. Institutional development was recommended to be done in coordination with the ADB financed Rural Water Supply Development Project and the KfW financed Sewerage, Drainage and Solid Waste Disposal Project.

End-of-phase evaluation

Final evaluation of Phase 1 was not yet done. Phase 1 was followed by a Standby Period (July - December 1995) and evaluation was left for further consideration after the Standby Period.

8 CONCLUSIONS AND RECOMMENDATIONS

In general terms, Phase 1 (1991-1995) of the Zanzibar Urban Water Supply Project has been successful. The general approach and working methodology of the project to work integrated into the DWD through the Urban Water Supply Section (UWSS) has proved to be successful, and this approach should be continued and strengthened until the permanent institutional arrangements of the urban water supply can be properly established.

The objectives set for the First Implementation Phase (1991-95) in the beginning were too optimistic, when they were compared to the real situation and development potential of the country and its water supply sector. Especially the expectations have been over-ambitious and exceeded the actual achievements in the economic and institutional development component, which is considered the most essential part of the project on the way towards sustainable water services in Zanzibar. The major task of gradual transformation of the UWSS to an autonomous and self-supporting Urban Water Supply Authority was not yet completed during Phase 1. Development of the policy issues and required legislation to enable official establishment of the authority was slower than anticipated. Most of the required documents and groundwork for administrative decisions were completed during Phase 1.

Intersectoral institutional and policy development was proposed to be done within the ADB financed institutional support consultancy, but it failed to start during Phase 1. This caused delays in the institutional arrangements of the urban water supply sector as well. However, the new Water Policy document prepared during Phase 1 reflected the need and aim of ultimately merging the water related sub-sectors under the same institutional umbrella.

The essential issue of reintroducing water charges for domestic consumers was still waiting for final approval at the end of Phase 1. As a consequence, the economic and financial situation of the Urban Water Supply Section and the Water Department did not adequately improve during Phase 1. Investments for improvement and even running costs of the water systems were almost entirely depending on the donor financing. Some improvement was achieved in the revenue collection from industrial and commercial consumers, but it did not much improve the overall financial performance.

The general attitude and atmosphere has after systematic efforts gradually become more favourable towards the policy changes and institutional reforms, considered essential to guarantee sustainability of the urban water services in the long run. During Phase 1 the project has nearly completed all necessary groundwork and documentation for the reforms, including most of the legislation, regulations and tariff proposals, as well as technical arrangements for billing and revenue collection. The prospects of achieving sustainable results in the future are good, although time schedule has been delayed from the originally planned.

In practical terms, within the UWSS, the working climate and working commitment of the staff have considerably improved. This applies both to seconded and directly employed staff. Internal work management and working methods have improved a lot, but still work management and working efficiency are considered some of the key areas to be developed in future. The consumer services of UWSS have been developed, improving the communication between the UWSS and consumers, and gradually creating a real service attitude among the UWSS.

Human resources development is a time taking process and requires various methods to be applied in parallel. Training needs still continue to be huge after Phase 1. The future training arrangements should aim at improving the situation with availability and qualifications of the local key management staff. Development of the UWSS gradually to an autonomous authority requires staff development and strengthening of managerial organization.

The relationship between the project (UWSS) and the DWD has become more intensive and cooperative, but due to the physical distance between UWSS and DWD offices some practical constraints have been faced. Another and probably bigger problem is that still the UWSS did not officially receive a status to run and manage the urban water services independently, without uncoordinated interference by politicians or other authorities. Before the establishment of an autonomous urban water supply authority the situation needs to be improved by officially allocating more executive power and autonomy for the UWSS. Being part of DWD this should not create any administrative contradiction. Appointment of competent local Project Managers on both islands could help the UWSS to gain a stronger and generally recognized status.

PROJECT FACT SHEET

Project Title:	Zanzibar Urban Water Supply Project, Implementation Phase I	
Project Number:	282 095 02-2	
Sector:	Social Infrastructure	
Subsector:	Urban Water Supply	
Project location:	The town of Zanzibar on Unguja island and the towns of Chake Chake, Wete and Mkoani on Pemba island in Zanzibar. Zanzibar forms part of the United Republic of Tanzania.	
Duration:	Planned 1991 - 1994, actual 1991 - mid 1995	
Starting date:	Planned January 1991, actual August 1991	
Project financing:	Government of Finland	FIM 50,000,000
	Government of Zanzibar	FIM 2,520,000 (TZS 126,000,000)
	TOTAL	FIM 52,520,000
Competent authorities:	Ministry of Finance, Tanzania	
	Ministry for Foreign Affairs, Finland/ Department for International Development Cooperation	
Implementing agency:	Ministry of Water, Construction, Energy, Lands and Environment, Zanzibar	
Executing agency:	Department of Water Development, Zanzibar	
Consultant:	Plancenter Ltd, Finland	

Arrangements for Coordination of Project Implementation:

The Steering Committee will supervise the implementation of the project.

PROJECT COMPONENT	MAIN ACTIVITIES / ACHIEVEMENTS
Economic and Institutional Development	
Year 1991 and 1992 :	
Financial and economic development	Urban Water Supply Section (UWSS) was formed Draft Decree for establishment of an Urban Water Supply Authority was prepared Updating of house connection register was started
Institutional arrangements and management development	Draft Ground Water Ordinance was prepared Draft Water Works Rules was prepared Organisational set-up for UWSS was established Computerized personnel register was established UWSS personnel policy was initiated Job descriptions of UWSS staff were prepared
Human resources development	Planning and monitoring system for training was prepared
Community education and participation	Coordinative committee for community education was est.
Year 1993 :	
Financial and economic development	House connection files transferred from DWD to UWSS Part of revenue collection staff transferred to UWSS New tariffs for commercial consumers were imposed
Institutional arrangements and management development	Working efficiency of UWSS was developed and improved UWSS salary policy was consolidated
Human resources development	Training for key administrative and technical staff was continued (Annex 5)
Community education and participation	Consumer services were transferred to UWSS

PROJECT COMPONENT	MAIN ACTIVITIES / ACHIEVEMENTS
Year 1994 :	
Financial and economic development	
Consumer registration	Consumer registration field work completed both in Unguja (26680 forms) and Pemba (5000 forms), computerization of data started (dBASE, 2000 forms).
Tariff studies and development	Real costs of supplying and distributing water were calculated to form a basis for tariff setting. Revised tariffs for commercial and institutional consumers introduced.
Revenue collection systems and staffing arrangements	Plans and preparations were made for commencing general revenue collection; revenue collection staff (2) were transferred to UWSS from DWD.
Revenue account arrangements	Local and foreign accounts for UWSS were opened to facilitate revenue collection and administration.
Task Force on Urban Water Supply (Economic and Institutional Development)	A Task Force was established to expedite development in economic and institutional reforms; four (4) meetings were held, proposals were prepared but not yet implemented.
Water Works' Rules	Updating of Towns' Water Works Rules (1940) was started. First updated draft was made.
Valuation of UWS assets	Valuation of existing assets of the urban water supply (ZUWSP and DWD) was started by a sub-consultant Ardhi Institute, DSM)
Institutional arrangements and management development	
Personnel Policy and Management	Staff Guide and Personnel Policy were reviewed and updated; Personnel Information Systems were improved, Job Descriptions updated. Salary scales and records were revised.
Human resources development	
Training and HRD Planning	Annual training plan was followed up and training plan for 1995 was prepared.
Training Programme	Implementation and follow up of training : formal long-term training abroad and in-country, short-term training courses, on-the-job training (See separate form for training courses).
Community education and participation	Meetings with Shehas and communities were arranged. Environmental and health education campaigns and materials were prepared (in cooperation with KfW financed Sewerage Project, Ministry of Health etc.).

MAIN ACTIVITIES AND ACHIEVEMENTS
1991 - 1995

PROJECT COMPONENT	MAIN ACTIVITIES / ACHIEVEMENTS
Year 1995 :	
Policy development	National Water Policy draft prepared Memorandum and Cabinet Paper on UWS issues made
Legislation development	Draft Bills for reintroduction of domestic water charges and for establishment of the water authority were made
Consumer registration	Computerization of data continued (dBASE, 5000 forms).
Tariff studies and development	Tariffs were adjusted and proposed for MWCELE
Revenue collection systems and staffing arrangements	Revenue collection was fully transferred to UWSS
Valuation of UWS assets	Valuation of existing assets of the urban water supply was completed (Unguja and Pemba)

PROJECT COMPONENT	MAIN ACTIVITIES / ACHIEVEMENTS

Water Supply Development

Year 1993 :

Planning and design activities	Surveying and mapping of the existing water supply systems was continued, about 40 km of lines surveyed. Pressure and flow monitoring was continued. 20 pressure recorders, monthly/weekly pressure observations. Plans and designs and contract documents were prepared for improvement of water supply systems. General planning and implementation programmes for future improvements were made.
Improvement of WS systems	See separate activity report forms attached (Annex 2)
Operation and maintenance of WS systems	Routine corrective and preventive maintenance of water supply systems was carried out. Service and maintenance of pumps and machinery, pipelines etc. Operation and maintenance manuals were prepared. Monitoring of water intakes and pumping stations, Leakage survey and repair programme was continued.

Year 1994 :

Planning and design activities	Surveying and mapping of the existing water supply systems was continued, about 40 km of lines surveyed. Pressure and flow monitoring was continued. 20 pressure recorders, monthly/weekly pressure observations. Plans and designs and contract documents were prepared for improvement of water supply systems. General planning and implementation programmes for future improvements were made. Water Loss Reduction Strategy was prepared.
Improvement of WS systems	See separate activity report forms attached (Annex 2)
Operation and maintenance of WS systems	Routine corrective and preventive maintenance of water supply systems was carried out. Service and maintenance of pumps and machinery, pipelines etc. Operation and maintenance manuals were prepared. Monitoring of water intakes and pumping stations, development of records and data bases. Leakage survey and repair programme was continued. Emergency repair systems and procedures were improved.

PROJECT COMPONENT	MAIN ACTIVITIES / ACHIEVEMENTS

Water Resources and Environmental Development

Year 1992 :

Drilling activities	See separate activity report forms attached (Annex 2)
Protection of water sources	
Environmental monitoring	Environmental assessment of water intakes (Pit latrine survey)

Year 1993 :

Drilling activities	See separate activity report forms attached (Annex 2)
Protection of water sources	
Environmental monitoring	Laboratory activities reviewed by short-term adviser. Water quality monitoring done on regular basis (weekly),
Environmental education/awareness	TV-play (Usilolijia) was prepared and shown

Year 1994 :

Drilling activities	See separate activity report forms attached (Annex 2)
Protection of water sources	Fencing of intake areas; now fencing ready for .. intakes (7 Unguja, .. Pemba). Resettling plan for people living in Mtoni spring area; replacement area surveyed, but people not yet moved. Forestation programme in Gawani spring area continued.
Environmental monitoring	Laboratory activities reviewed by short-term adviser. Water quality monitoring done on regular basis (weekly), laboratory services developed more commercial.
Environmental education/awareness	TV and video programmes on water and environmental issues prepared and presented (joint programme with KfW financed Sewerage Project). Campaigns, meetings and direct contacts with communities consumers and shehas were arranged.
Task Force on environment	Staff participated in Task Force work, .. meetings.

Year 1995 :

Drilling activities	See separate activity report forms attached (Annex 2)
Protection of water sources	Activities to protect Mtoni spring area were continued
Environmental monitoring	Water quality monitoring was continued

MAIN ACTIVITIES AND ACHIEVEMENTS 1991 - 1995

PROJECT COMPONENT	MAIN ACTIVITIES / ACHIEVEMENTS
Workshop Activities	
Year 1991 :	
Mabluu workshop (DWD)	Inventory of existing tools, equipment and machinery Purchase order prepared for new tools and equipment
Year 1992 :	
	Workshop activities were carried out mainly at the Saateni pumping station area
Year 1993 :	
ZUWSP own workshop premises	Workshop plot was allocated for ZUWSP in Saateni Rehabilitation of workshop building was started
Year 1994 :	
	Rehabilitation of workshop facilities completed. Transfer of stores facilities to workshop started (70 %). Development of workshop and stores management systems started; procedures, data bases etc.
Year 1995 :	
	Transfer of stores facilities to workshop completed (100 % Arrangement and inventory of stores

PHYSICAL IMPROVEMENTS IN UNGUJA
1991 - 1995

WATER INTAKES AND PUMPING STATIONS	ACTIVITY / IMPROVEMENTS DONE
Year 1991 :	
Bububu booster station	New pump and starter installed
Kijito Upele (U-013)	Handpump installed temporarily to the borehole
Borehole intakes	24 nos of submersible pumps & starters ordered
Saateni pumping station	1 no electric motor & starter ordered
Year 1992 :	
Chunga (U-009)	New control room constructed
Chunga (U-008)	New control room constructed, switchboard installed
Kijito Upele (U-013)	New pump/starter/switchboard/control room
Kaburi Kikombe (U-002)	New pump/starter/switchboard/control room
Kaburi Kikombe (U-010)	New pump and starter installed
Kianga (U-004)	New pump and starter installed
Saateni pumping station	New motors and starters installed (3 nos)
	New main swirchboard installed
	Rehabilitation of booster pumps (3 nos)
Bububu booster station	New pump and suction pipe
Dimani cave	New submersible pump installed
Year 1993 :	
Mto Pepo / Mtoni spring	Erosion protection wall was constructed
Chunga (U-009)	New wellhead, new pump installed
Chunga (U-008)	New wellhead, new pump installed, fencing
Mwembe Mchomeke (U-005)	New wellhead, new pump installed, fencing
Kaburi Kikombe	Fencing of wellfield area
Mtoni spring booster station	New pump, rehabilitation of electrical installations
Dimani cave	New submersible pump installed

PHYSICAL IMPROVEMENTS IN UNGUJA
1991 - 1995

WATER INTAKES AND PUMPING STATIONS	ACTIVITY / IMPROVEMENTS DONE
Year 1994 :	
Mwembe Mchomeke (U-019)	New borehole, wellhead constructed, control room, transformer stand, fence, pumping main
Mwembe Mchomeke (U-005)	New pump installed
Mwembe Mchomeke (U-001)	New starter panel (switchboard) installed
Kijito Upele (U-013)	New pump installed, fence constructed
Kijito Upele (U-016)	Fence constructed
Dimani cave	New pump installed, conductivity meter installed
Bububu spring booster station	New submersible pump installed
Mtoni spring booster station	Control room rehabilitated
Mtoni spring intake	Spring shelter building rehabilitated
Mbweni (U-012)	Rising main piping repaired
Saateni pumping station	Rehabilitation of booster pump N:o 3 (new motor), installation of pressure gauges and indicators, repair of roofing for elevated water tank N:o 1, reinstallation of chlorination system
Kaburi Kikombe (U-002)	New pump, several times cleaning of borehole
Kaburi Kikombe (U-003)	New pump, several times cleaning of borehole
Kaburi Kikombe (U-010)	Reconstruction of wellhead, new pump installed
Kaburi Kikombe (U-014)	New pump/motor, partial rehabilitation of wellhead
Mnara wa Mbao booster station	Reinstallation of submersible booster pump, cleaning of underground water reservoir
Amaan Stadium	Installation of booster pump and elevated tanks
Year 1995 :	
Chunga (U-008)	New pump installed
Kaburi Kikombe (U-002)	New pump installed
Kaburi Kikombe (U-003)	New pump installed
Chunga (U-009)	New starter panel (switchboard) installed

PHYSICAL IMPROVEMENTS IN UNGUJA
1991 - 1995

WATER DISTRIBUTION MAINS AND PIPELINES	SIZE AND LENGTH OF PIPELINE
Year 1991 :	
Year 1992 :	No major pipeline rehabilitation works were carried out in 1991-1992
Year 1993 :	
Welezo main line	Pipe supports
Daraja Bovu main line	Pipe supports and bridges
Chunga-Kijito Upele main line	D 225 PVC, 3050 m
Jangombe distribution lines	D 110 PVC, 1015 m
Jangombe-Urusi distribution lines	D 50 GI, 520 m; D 40 GI, 188 m; D 25 GI, 633 m
Mwanakwerekwe distribution lines	D 160 PVC, 290 m; D 110 PVC, 182 m; D 75 PEH, 440 m; D 50 PEH, 440 m
Nyerere distribution lines	D 90 PEH, 200 m; D 75 PEH, 230 m; D 50 PEH, 590 m; D 32 PEH, 510 m
Maruhubi distribution lines	D 50 GI, 348 m
TOTAL LENGTH ABOUT	8.7 km

PHYSICAL IMPROVEMENTS IN UNGUJA
1991 - 1995

WATER DISTRIBUTION MAINS AND PIPELINES	SIZE AND LENGTH OF PIPELINE
Year 1994 :	
Mwembe Mchomeke (U-019) pumping main	D 315 PVC, 770 m; D 225, 15 m
Mwanakwerekwe main lines	D 160 PVC, 660 m
Mwanakwerekwe distribution lines	D110 PVC, 630 metres D 75 PEH, 470 m; D 50 PEH, 240 m
Mombasa main lines	D 160 PVC, 1940 m
Mombasa distribution lines	D 75 PEH, 700 m; D 50 PEH, 50 m; D 32 PEH, 200 m
Jangombe distribution lines	D 110 PVC, 1510 m
Nyerere distribution lines	
Kwamtipura distribution lines	D 110 PVC, 850 m; D 63 PEH, 2370 m; D 50 PEH, 240 m; D 32 PEH, 50 m
Kiembe Samaki distribution lines	D 110 PVC, 1220 m; D 75 PEH, 240 m, D 63 PEH, 70 m; D 50 PEH, 125 m
Kwahajitumbo distribution lines	D 110 PVC, 820 m; D 50 GI, 920 m
Dhow Harbour	D 90 PEH, 80 m
Ziwani police barracks	D 90 PEH, 65 m
Magogoni distribution lines	D 110 PVC, 660 m; D 75 PEH, 460 m; D 32 PEH, 100 m
Kibweni-Bububu distribution lines	D 110 PVC, 640 m; D 63 PEH, 525 m; D 50 PEH, 1070 m; D 32 PEH, 100 m
Shariff Mussa distribution lines	D 75 PEH, 500 m; D 50 PEH, 200 m
Mtoni Kigomeni distribution lines	D 75 PEH, 500 m; D 50 PEH, 285 m
Sebleni-Begamoja distribution lines	D 110 PVC, 315 m; D 75 PEH, 320 m; D 50 PEH, 800 m
Tomondo distribution lines	D 75 PEH, 770 m; D 50 PEH, 600 m; D 32 PEH, 400 m
Kilimani blocks service lines	D 40 GI, 1150 m
Mtoni distribution lines	D 75 PEH, 200 m; D 50 PEH, 300 m
Stone Town distribution lines	D 50 PEH, 367 m; D 32 PEH, 15 m
TOTAL LENGTH ABOUT	25 km

WATER DISTRIBUTION MAINS AND PIPELINES	SIZE AND LENGTH OF PIPELINE
Year 1995 :	
Mombasa-Kiembe Samaki area mains and distribution lines	D 160 PVC, 2200 m; D 110 PVC, 2100 m; D 90 PEH, 1210 m; D 75 PEH, 620 m; D 50 PEH, 160 m; D 32 PEH, 320 m
Mwanakwerekwe - K/Upele	D 75 PEH, 200 m
Mwanyanya distribution lines	D 75 PEH, 200 m; D 50 PEH, 200 m; D 32, 100 m
Kiembe Samaki-Mbweni line	D 110 PVC, 500 m; D 50 PEH, 450 m
Kibweni-Bububu distribution lines	D 110 PVC, 638 m; D 63 PEH, 970 m; D 50 PEH, 720 m; D 32 PEH, 100 m
Jangombe-K/Kikombe lines	D 75 PEH, 20 m
Saateni distribution lines	D 63 PEH, 27 m
Chumbuni distribution lines	D 32 PEH, 131 m
Stone Town distribution lines (Kajificheni area)	D 50 PEH, 285 m; D 32 PEH, 156 m
Bububu-Kidichi distribution lines	D 63 PEH, 450 m; D 50 PEH, 40 m
Magomeni distribution lines	D 110 PVC, 250 m; D 63 PEH, 1100 m; D 50 PEH, 500 m; D 32 PEH, 100 m
Mpendae distribution lines	D 110 PVC, 400 m; D 90 PEH, 350 m
Jangombe (Mshelishelini) lines	D 75 PEH, 100 m
Mkele (Kwa Bimtoro) lines	D 75 PEH, 100 m
Mwembe Makumbi lines	D 63 PEH, 150 m; D 32 PEH, 200 m
Jangombe Nursery School line	D 32 PEH, 200 m
Mwanakwerekwe-Magomeni lines	D 90 PEH, 100 m
TOTAL LENGTH ABOUT	(14.1 km)

PHYSICAL IMPROVEMENTS IN UNGUJA
1991 - 1995

DRILLING SITE	ACTIVITY / IMPROVEMENTS DONE
Year 1991 :	
Year 1992 :	
Kijito Upele	Geoelectrical sounding of the drilling site
Kijito Upele	Drilling of new borehole U-016 (for rural WS)
Kaburi Kikombe	Cleaning and rehabilitation of existing boreholes
Year 1993 :	
Bububu, Kianga, Mtopepo, Mwembe Mchomeke	Geoelectrical drawings of the drilling sites
Mwembe Mchomeke (U-018)	Drilling of observation borehole (U-018)
Mwembe Mchomeke (U-019)	Drilling of new production borehole (U-019)
Year 1994 :	
Chunga	Drilling of a new observation borehole (U-024) near Chunga U-009
Fuoni	Monitoring borehole started (U-025) (to monitor salinity changes towards Chunga BHs)
Bububu, Ndunduke	Drilling of new observation boreholes (U-020, 021) (used in Halcrow's studies)
Bumbwi Sudi	Drilling of a new production borehole (U-022) for irrigation purposes
Muyuni	Drilling of a new production borehole (U-023) for rural water supply
Kaburi Kikombe	Cleaning of boreholes U-002 and U-003
Year 1995 :	
Fuoni	Monitoring borehole completed (U-025)
Chunga	Drilling of a new production borehole (U-026)

PHYSICAL IMPROVEMENTS IN PEMBA
1991 - 1995

WATER INTAKES AND PUMPING STATIONS	ACTIVITY / IMPROVEMENTS DONE
Year 1991 :	
Wete	
Gawani spring	Rehabilitation drawings for intake structures
	New pumps and starters were ordered
	Several handpumps were installed into shallow wells
Chake Chake	
	New pumps and starters were ordered
	Several handpumps were installed into shallow wells
Mkoani	
	Several handpumps were installed into shallow wells
	New pumps and starters were ordered
Year 1992 :	
Wete	
Bungumi spring	New pump and starter installed
Gawani spring	New pump and starter installed
Mtemani booster station	New pump installed
Chake Chake	
Kwapweza spring	New pump and starter installed
Fidel Castro booster station	New pump installed
Changaraweni borehole	New pump and starter installed
Jamvini C7 borehole	New pump installed
Jamvini C8 borehole	New pump and starter installed
Machomane booster station	New pump installed
Mkoani	
Changaweni boreholes	New pumps installed (2 nos)
Uweleni (Kipitacho) borehole	New pump installed
Kiguuni spring	New pump installed
Year 1993 :	
Wete	
Gawani spring	New intake structures / wellhead / new pump
Chake Chake	
Machomane booster station	New pump installed
Changaraweni borehole	New wellhead, rehabilitation of electrical installations
Jamvini C7 borehole	Rehabilitation of electrical installations and construction of new well head
Mkoani	
Kiguuni spring	New pump installed
Changaweni boreholes	New pump installed, rehabilitation of electrical inst.
Cogefar borehole (Harbour)	New pump installed, rehabilitation of electrical inst.

PHYSICAL IMPROVEMENTS IN PEMBA
1991 - 1995

WATER INTAKES AND PUMPING STATIONS	ACTIVITY / IMPROVEMENTS DONE
Year 1994 :	
Wete	
Bungumi spring	Rehabilitation of wellhead
Gawani spring	Fence constructed, pump sump cleaned
Mtemani booster station	Minor rehabilitation of booster pumps, construction of vehicle ramp
Chake Chake	
Kwapweza spring	Rehabilitation of the spring superstructure and well-head, installation of a new submersible pump
Changaraweni borehole	Installation of new pump, wellhead rehabilitated, water meter installed
Jamvini C7 (PC 01)	New roof installed for control room
Machomane water reservoir	Cleaning, painting and repair of water reservoirs
Mkoani	
Kiguuni spring (PM 06)	New submersible pump intalled, pump sump cleaned
Changaweni boreholes (PM 07-09)	New pumps installed, boreholes cleaned
Kipitacho (Uweleni) (PM 10)	New pump installed, water meter installed
Uweleni water reservoir	Cleaning and repair of elevated water reservoir done
Year 1995 :	
Wete	NIL
Chake Chake	
Jamvini C7 (PC 07)	New pump installed
Mkoani	
Ngombeni borehole (PM-512)	New wellhead / control room / new pump installed
Cogefar borehole	Starter unit repaired

PHYSICAL IMPROVEMENTS IN PEMBA
1991 - 1995

WATER DISTRIBUTION MAINS AND PIPELINES	SIZE AND LENGTH OF PIPELINE
Year 1991 :	NIL
Year 1992 :	
Wete	
Gawani-Mtemani rising main	D 160 PVC, 1100 m
Year 1993 :	
Wete	
Distribution lines	D 50 PEH, 450 m
Chake Chake	
Machomane-Wavi distribution line	D 160 PVC, about 2000 m
Jamvini C7 pumping main	D 50 GI, 80 m
Mkoani	
Makombeni distribution line	D 40 PEH, about 2000 m

PEMBA, TOTAL LENGTH ABOUT 4.5 km

PHYSICAL IMPROVEMENTS IN PEMBA
1991 - 1995

WATER DISTRIBUTION MAINS AND PIPELINES	SIZE AND LENGTH OF PIPELINE

Year 1994 :

Wete

Bubujiko distribution lines	D 110 PVC, 800 m; D 40 PEH, 600 m
Limbani distribution lines	D 110 PVC, 600 m; D 40 PEH, 900 m
Bopwe distribution lines	D 160 PVC, 500 m; D 110 PVC, 400 m; D 50 PEH, 300 m; D 32 PEH, 300 m
Bungumi pumping main	D 200 ST, 120 m; D 225 PVC, 130 m
Kizimbani distribution lines	D 50 PEH, 200 m; D 40 PEH, 300 m
TOTAL LENGTH ABOUT	5.1 km

Chake Chake

Machomane-Town distribution main at Michakaeni	D 150 AC, 570 m
Wawi school line	D 40 PEH, 1400 m
Kichungwani distribution line	D 50 PEH, 150 m
Madungu-Miembeni main line	D 160 PVC, 1500 m
Karume Airport line	D 63 PEH, 500 m
Machomane distribution lines	D 110 PVC, 400 m; D 63 PEH, 190 m
Tibirinzi area distribution lines	D 110 PVC, 500 m
Changarawemi pumping main	D 160 PVC, 100 m
Chanjaani distribution line	D 110 PVC, 600 m
Michakaeni distribution lines	D 40 PEH, 200 m; D 32 PEH, 300 m; D 50 PEH, 150 m
Oysterbay distribution lines	D 40 PEH, 500 m
Mkoroshoni distribution lines	D 50 PEH, 100 m
Chake Chake Hotel - Hospital distribution line	D 150 CI / D 160 PVC, 600 m; D 50 GI, 600 m
TOTAL LENGTH ABOUT	8.3 km

Mkoani

Kibigilini distribution lines	D 32 PEH, 100 m
Mbuyuni distribution lines	D 32 PEH, 300 m
Kijichi distribution lines	D 32 PEH, 100 m
Kinyasini distribution lines	D 32 PEH, 100 m
Mkarafuuni distribution lines	D 32 PEH, 200 m
Mbuguani distribution lines	D 32 PEH, 100 m
TOTAL LENGTH ABOUT	0.9 km

PEMBA, TOTAL LENGTH ABOUT 14 4 km

WATER DISTRIBUTION MAINS AND PIPELINES	SIZE AND LENGTH OF PIPELINE

Year 1995 :

Wete

Mtemani distribution lines	D 40 PEH, 100 m

Chake Chake

Gombani distribution main	D 160 PVC, about 1400 m
Mwanamashungi distribution lines	D 40 PEH, 400 m; D 50 GI, 60 m; D 50 PEH, 85 m

Mkoani

Ngombeni-Uwelemi pumping main	D 110 PVC, about 1000 m

PEMBA, TOTAL LENGTH ABOUT 3.0 km

PHYSICAL IMPROVEMENTS IN PEMBA
1991 - 1995

DRILLING SITE	ACTIVITY / IMPROVEMENTS DONE
Years 1991 - 1993 :	
Wete, Chake Chake, Mkoani	No drilling activities were carried out yet
	3 nos boreholes were cleaned (rehabilitated)
Year 1994 :	
Wete	
	Selection of potential drilling sites was done
Chake Chake	
	Selection of potential drilling sites was done
Mkoani	
Ngombeni	Drilling of a new production borehole PM-512 was completed
Makombeni (Darajani)	Drilling of a test borehole in Makombeni valley was started
Changaweni	Cleaning of Changaweni boreholes was done
Year 1995 :	
Wete	No drilling activities
Chake Chake	No drilling activities
Mkoani	
Makombeni (Darajani)	Drilling of a test borehole in Makombeni valley (PM-516) was completed
Makombeni (Darajani)	Drilling of a production borehole in Makombeni valley (PM-517) was done

URBAN WATER SUPPLY PROJECT - UNGUJA

STAFF PARTICULARS FROM 01.08.91 TO 30.06.95

ADMINISTRATION

NO	NAME	JOB TITLE	EDUCATION	PERIOD OF EMPLOYMENT		SECONDED FROM DWD	DIRECT EMPLOYED
				FROM	TO		
01	Haula Kassim Issa	Administrative Officer	PGD in Development Finance (Public Sector) & Advanced Diploma in Public Administration	01.08 91	30 06.95	X	-
02	Daud Suleiman Daud	Asst Administrative Officer	Diploma in Education	15 10 92	30 06 95	X	-
03	Mussa Ali Shehe	Public Relations Officer	PGD in Environment Management for Development Countries & Degree in Public Administration	15 10 92	30 06 95	X	-
04	Msellem Khamis Omar	Accountant	PGD in Accounting/Auditing & Diploma in Accountancy	04 01.93	30.06 95	X	-
05	Mwanaisha Suleiman	Consumer Clerk	Form IV	18.01 93	30 06 95	X	-
06	Fadhila Saleh Ali	Consumer Attendant	Form IV	27.09 93	30 06 95	X	-
07	Said Salim Magram	Chief Accountant	Bankers Executive Course	01.08 91	30 06.95	-	X
08	Farhana Mitha	Secretary	Diploma in Secretarial Studies	01 08.91		-	X
09	Valene Dasilva	Secretary	Form VI & Certificates In Computer	15.06.94	30.09.94	-	X
10	Aisha Rashid Suleiman	Secretary	Full Secretarial Certificate in Computer	12 09 94	30.06.95	-	X
11	Ahmada Abdalla	Office Clerk	Form III	01 08 91	30 06 95	-	X
12	Minne Rashid	Office Cleaner	Form I	01.08.91	30.06.95	-	X
13	Mkasi Makame Haji	Officer Cleaner	Std VIII	11 11.92	30.06.95	X	-
14	Shaib Moh'd Aziz	Accounts Clerk	Form III - Certificate in Accounting	18.09 94	30.06 95	X	-

PLANNING & DESIGN

NO	NAME	JOB TITLE	EDUCATION	PERIOD OF EMPLOYMENT		SECONDED FROM DWD	DIRECT EMPLOYED
				FROM	TO		
01	Bakar Juma Bakar	Civil Engineer	Advanced Diploma in Civil Engineering	29 07 93	30.06.95	X	-
02	Juma Ali Othman	Water Technician	Full Technician Certificate	01 08 91	30 06 95	X	-
03	Gharib Khamis Maalim	Draughtsman	Full Technician Certificate	01 08 91	30 06 95	X	-
04	Masoud Kombo Masoud	Water Technician	Full Technician Certificate	21 09 92	30 06 95	X	-
05	Ali Haji Juma	Surveyor	Form III	01.08 91	27 12 94-DIED	X	-
06	Hamdu Haji Ame	Asst Surveyor	Std VIII	01 08 91	30 06 95	X	-
07	Maulid Yussuf Saleh	Water Technician	Form IV	01 01 94	30 06.95	X	-
08	Moh'd Hamdu Haji	Daily Paid	Form III	04 11 92	30 06 95	-	X
09	Bilal Khalid	Daily Paid	Form IV	05 11 92	30 06 95	-	X
10	Hassan Ali Hassan	Daily Paid	Form III	07 12.93	30 06.95	-	X
11	Mzee Mpatani Ali	Water Engineer	Msc. In Tropical Public Health Engineering	01 08 91	30 10.91	X	-
12	Ali Suleiman Amour	Water Supply Engineer	Advanced Diploma (C E) & Msc. Public Health Engineering	03 02 92	26 07.93	X	-
13	Mussa Moh'd Mussa	Water Technician	Full Technician Certificate	21.09.94	30 06 95	X	-
14	Abdalla Ali Abdalla	Water Technician	Full Technician Certificate	23 05.91	30 06 93	X	-

OPERATION AND MAINTENANCE

NO	NAME	JOB TITLE	EDUCATION	PERIOD OF EMPLOYMENT		SECONDED FROM DWD	DIRECT EMPLOYED
				FROM	TO		
01	Salim Hamad Salim	Duty Master	Full Technician Certificate	28.09 92	30 06.95	X	-
02	Hafidh Suleiman Makame	House Connection Supervisor	Full Technician Certificate	22 06 92	30 06 95	X	-
03	Moh'd Rajab Khamis	Chief Plumber	Std VI	27 04 92	30 06 95	X	-
04	Moh'd Khamis Khamis	Plumber - Foreman	Std VI	06 02 92	30 06 95	X	-
05	Ali Abass Kiringe	Plumber - Foreman	Std VIII	01.10.92	30 06 95	X	-
06	Simba Abdalla Maalim	Plumber - Foreman	Trade Test/Plumber	02 02 93	30 06 95	X	-
07	Maulid Haji Kinange	Site Inspector	Full Technician Certificate	17 02 93	30 06 95	X	-
08	Khamis Kombo Khamis	Fundi (Tanks)	Std VIII	16 02 92	30 06 95	X	-
09	Moh'd Omar Hamad	Plumber	Std VI	23 08 93	30 06 95	X	-
10	Ali Mtwana Juma	Plumber	-	23.08 93	30 06 95	X	-
11	Ali Moh'd Makame	Plumber	-	23 08 93	30 06 95	X	-
12	Rakwe Iddi Rakwe	Plumber - Training	Std VI	01 10 92	30 06 95	X	-
13	Abdalla Mzee Abdalla	Daily Paid	Form III	27.04.92	30 06.95	-	X
14	Hassan Masoud Hassan	Daily Paid	-	27 04.92	30 06.95	-	X
15	Jaffar Haji Mjombo	Plumber - Temporary	-	05 05 94	-	X	-
16	Abdalla Sheikhan Hussein	Plumber - Temporary	Plumbing Course	05 05 94	-	X	-
17	Said Moh'd Abdalla	Plumber - Temporary	-	05.05 94	-	x	-
18	Suleiman Juma Slima	Plumber - Temporary	-	05.05 94	-	X	-
19	Bakar Salim Kombo	Plumber - Temporary	Plumbing Course	05 05 94	-	X	-
20	Mwinyi Abdalla Faki	Plumber - Temporary	-	05 05 94	-	X	-
21	Khamis Faki Ali	Assistant Plumber	-	28 08.93	30 06 95	X	-
22	Juma Juma Mlekwa	Assistant Plumber	-	06.02.92	30 06 95	X	-
23	Moh'd Hassan Aboud	Assistant Plumber	Form III	07.12 93	30.06.95	X	-

SAATENI PUMPING STATIONS

NO	NAME	JOB TITLE	EDUCATION	PERIOD OF EMPLOYMENT		SECONDED FROM DWD	DIRECT EMPLOYED
				FROM	TO		
01	Salim Rashid	Operation Supervisor	Std VIII	07 09 92	30 06 95	-	X
02	Salim Dadi Kombo	Asst Operation Supervisor	From III	01 10 92	30 06 95	X	-
03	Pandu Hassan Ame	Pump Attendant	-	01 10 92	30.06 95	X	-
04	Yussuf Shaib Yussuf	Pump Attendant	Form III	01 10 92	30.06.95	X	-
05	Moh'd Othman Juma	Pump Attendant	-	01 10 92	30 06 95	X	-
06	Abdi Moh'd Yussuf	Pump Attendant	Std VI	01 10 92	30 06 95	X	-
07	Abdalla Omar Mbwana	Pump Attendant	-	01 10 92	30 06 95	X	-
08	Mwanajuma Tano	Cleaner	Std VI	01.10.92	30.06 95	X	-
09	Pili Moh'd Shamte	Cleaner	Std VIII	01 10 92	30 06 95	X	-
10	Mtumwa Khamis Bakar	Cleaner	-	01 10.92	30 06 95	X	-
11	Mariam Ali Moh'd	cleaner	-	01.10.92	30 06 95	X	-
12	Mwanaisha Moh'd Ali	Cleaner	-	01.10.92	30 06.95	X	-
13	Ali Juma Kombo	Watchman	-	01.10.92	30 06 95	X	-
14	Mtoro Nassor Ali	Watchman	-	30.09.92	30 06 95	X	-
15	Ramadhan Suleiman Nassor	Watchman	-	01 10.92	30 06.95	X	-
16	Dadi Ali Ramadhan	Daily Paid	Std III	30.09.92	30.06 95	-	X
17	Omar Suleiman	Daily Paid	-	30.09 92	30.06 95	-	X
18	Nassor Rashid Moh'd	Daily Paid	Form III	28.09.92	30 06 95	-	X
19	Bakar Moh'd Haji	Pump Attendant	-	28.09 92	30 06 95	-	X

WATER RESOURCES & DRILLING

NO	NAME	JOB TITLE	EDUCATION	PERIOD OF EMPLOYMENT		SECONDED FROM DWD	DIRECT EMPLOYED
				FROM	TO		
01	Hamad Juma Bakar	Hydrogeologist	Msc in Hydrogeology	01 08.91	30.06 95	X	-
02	Saleh Mzee Saleh	Water Technician	Full Technician Certificate	01 08.91	30 06 95	X	-
03	Aziz Ahmada Hija	Driller Foreman	-	01 11 93	30 06 95	-	X
04	Saleh Juma Saleh	Driller	Std VIII	13 01 93	30.06 95	X	-
05	Henry Paul	Driller	Std VI	13 01 92	30 06 95	X	-
06	Mgeni Mohammed Mgeni	Driller Foreman	-	13.01 92	30 06 95	X	-
07	Hassan Ali Hassan	Welder	Form III - Trade Test Welding	12 02.92	30 06 95	X	-
08	Haji Khamis Haji	Driller	Full Technician Education	11 09 92	30.06.95	X	-
09	Ali Mohammed Zubeir	Driller	Form III	11.09 92	30 06 95	-	X
10	Mariam Hassan	Geologist/Hydrogeologist	Degree in Geology	20 10.93	30 06 95	X	-
11	Mussa Haji Mwadini	Driller	Form III	24 11 93	30 06 95	-	X
12	Bakar Mohammed Bakar	Driller	Std VII	23.12 93	30.06 95	-	X
13	Mohammed Mgeni Mohammed	Drilling Trainee	Std V	23 12 93	30 06 95	-	X
14	Hamza Hussein Msafir	Drilling Trainee	Form III	01 12 93	30 06 95	-	X
15	Sanura Mohammed Abdulla	Laboratory Technician	Full Technician Certificate	01 08.91	30 06.95	X	-
16	Ameir Mwadini Nahoda	Laboratory Technician	Full Technician Certificate	01 08 91	30 06 95	X	-
17	Abdalla Ali Hamad	Laboratory Technician	Full Technician Certificate	03.05.93	30.06 95	X	-
18	Moh'd Ali Moh'd	Driller	Form III	13 01 92	30 06 95	X	-

WORKSHOP (2 pages)

NO	NAME	JOB TITLE	EDUCATION	PERIOD OF EMPLOYMENT		SECONDED FROM DWD	DIRECT EMPLOYED
				FROM	TO		
01	Juma Alawi Mohammed	Workshop - Foreman	Full Technician Certificate	07 05 92	30 06.95	X	-
02	Khamis Mohammed Saleh	Mechanics	Form III	01 10.92	30.06.95	X	-
03	Khalfan Omar Juma	Mechanical Engineer	Advanced Diploma in Mechanical Engineering	29 07 93	30 06 95	X	-
04	Haji Faki Khamis	Electrician	STd VI	01 08.91	30 06.95	X	-
05	Ali Said Mohammed	Electrician - Foreman	Trade Test/Electric	13 01 93	30 06 95	X	-
06	Rahim Abeid Hamad	Electrician	Form IV	13 01 93	30 06 95	X	-
07	Shaaban Hamad Vuai	Electrician	Form IV	13 01 93	30.06 95	X	-
08	Omar Suleiman Said	Mechanic	Form III	15 02 92	30.06.95	-	X
09	Abdalla Ali Khamis	Auto Mechanic	Full Technician Certificate in Auto Mechanics	10 06 94	30 06 95	X	-
10	Mzee Kondo	Motorbike Mechanic	Std VIII	10 06 94	30 06 95	X	-
11	Kombo Juma Machano	Sisu - Driver	Std VIII	01 08 91	30 06.95	X	-
12	Hamad Juma Khamis	Driver	Std IV	28.09.92	30.06.95	-	X
13	Khamis Simba	Driver	Std IV	14.10 92		-	X
14	Mabrouk Juma Hassan	Driver	Std VI	15.10.91	30.06.95	X	-
15	Mzee Haji Maalim	Driver	-	16 09 91	30 06 95	X	-
16	Omar Said Ali	Driver	-	01 08 91	30 06 95	X	-
17	Ali Suleiman Haji	Tractor Driver	Std VII	03 09 92	30 06 95	-	X
18	Issa Bakar Gulam	Driver	Std VIII	10 06 94	30 06 95	X	-
19	Haji Said Haji	Pump - Foreman	Full technician Certificate	01.10.92	30.06 95	X	-
20	Sharif Ahamada Hija	Welder	Full Technician Certificate	05 05 94	30 06 95	X	-
21	Amour Seif Salum	Welder	Welding Course	01 10 92	30 06.95	X	-

22	Dau Juma Dau	Welder	Trade Test/Welding	01 07 93	30 06 95	X	-
23	Mussa Haji Nyange	Mason	-	01 01 93	30.06 95	X	-
24	Mmanga Ibrahim	Daily Paid	Form III	30 12 92	30.06 95	-	X
25	Hamad Abdalla Machano	Assistant Mason	-	28 12 92	30 06.95	-	X
26	Rajab Khamis	Store - Foreman	Form III (N S K C)	07 05 92	30 06.95	X	-
27	Asha Salum	Store Attendant	Std VII	13 04 92	30 06.95	-	X
28	Amour Haji Suleiman	Storeman	Form III	06 02 92	30 06 95	X	-
29	Said Salim Abdalla	Procurement Officer	Std X	01 08 91	31 12 94	-	X
30	Fatma Shehe Msuri	Cleaner	Form III	10 06 94	30 06 95	X	-
31	Asya Hassan Chande	Secretary	Form III Certificate	25 05 94	30 06 95	X	-
32	Mchanga Khamis Juma	Electrician	Full Technician Certificate	12 08 93	20.04 94	X	-
33	Ramadhan Nuhu	Tractor Driver	Std VII	01 05 91	28.06 93	-	X

URBAN WATER SUPPLY PROJECT - PEMBA

ADMINISTRATION

NO	NAME	JOB TITLE	EDUCATION	PERIOD OF EMPLOYMENT		SECONDED	DIRECT EMPLOYED
				FROM	TO		
01	Moh'd Salım Abdalla	Administrative / Consumer Officer	Form IV	15 01 93	30 06 95	-	X
02	Tatu Yussuf Khamıs	Secretary	Form IV Certificate	01 09 93	30 06 95	-	X
03	Khamis Shaame Khamıs	Charge Collector	Form IV Certificate	29 11 93	30.06 95	X	-
04	Habıba Moh'd Juma	Cleaner	Form III	01 01 94	30 06 95	-	X
05	Alı Abdalla Moh'd	Watchman	Form III	02 01 92	30 06 95	-	X
06	Shariff Hamad Fakı	Watchman	Std I	09 09 91	30 06 95	-	X
07	Khamıs Jamal Khamıs	Watchman	Form III	01 08 91	30 06 95	-	X
08	Moh'd Tamım Alı	Watchman	Std I	01 08 91	30 06 95	-	X
09	Bimkubwa Moh'd	Cleaner	Std II	01 03 91	30 06 95	-	X
10	Alı A Alı	Watchman	Std I	02.01.92	30.06 95	-	X

PLANNING AND DESIGN

NO	NAME	JOB TITLE	EDUCATION	PERIOD OF EMPLOYMENT		SECONDED FROM DWD	DIRECT EMPLOYED
				FROM	TO		
01	Moh'd Abdalla Moh'd	Civil Engineer	Msc Urban Management & Bsc Engineering (CE)	01 08 91	30.06 95	X	-
02	Said Ali Mbarouk	Mechanical Engineer	Advanced Diploma in Engineering (M E)	07 06.93	30 06.95	X	-

OPERATION & MAINTENANCE

NO	NAME	JOB TITLE	EDUCATION	PERIOD OF EMPLOYMENT		SECONDED	DIRECT EMPLOYED
				FROM	TO		
			MAIN TEAM				
01	Omar Moh'd Ali	Electrical Technician	Full Technician Certificate	15.01 93	30 06 95	X	-
02	Hamad M Rashid	Electrician	Trade Test	11-05 92	30 06.95	X	-
03	Moh'd Yahya	Plumber	Std I	28 08 92	30 06 95	X	-
04	Juma A Juma	Assistant Plumber	Std I	28 08 92	30 06 95	X	-
05	Abdalla S Moh'd	Welder	Form IV	01 04 93	30 06 95	-	X
			CHAKE CHAKE				
06	Said Yussuf Ali	Water Technician	Full Technician Certificate	21 12 92	30 06 95	X	-
07	Zubeir Makame Rajab	Plumber	Std VI	25 01 93	30 06 95	X	-
08	Miraji Abdalla Sawa	Plumber	Std VI	18 11 93	30 06 95	X	-
09	Ali Iddi Ali	Daily Paid	Std III	01 12 92	30 06 95	-	X
10	Hamad Saleh Shaame	Daily Paid	Std III	01.12.92	30.06 95	-	X
11	Yahya J Hamad	Welder	Std VIII	28 08.92	30.06 95	X	-
12	Omar M Salim	Daily Paid	Std VIII	21 12.92	30.06.95	-	X
13	Omar Moh'd Salim	Daily Paid	Form I	01 12 92	30 06 95	-	X
			WETE				
14	Omar Ali Omar	Water Technician	Full Technician Certificate	21.09 93	30 06 95	X	-
15	Moh'd Ali Saleh	Water Technician	Full Technician Certificate	01 08 91	30 06 95	X	-
16	Amour Khalfan Said	Plumber	Std VIII	18 08 92	30 06 95	X	-
17	Faki Juma Kombo	Plumber	Std VIII	18 08 92	30 06 95	X	-
18	Moh'd Msellem Said	Clerk	Std VIII	01 05 94	30 06 95	X	-
19	Abdalla Omar Haji	Assistant Plumber	Std III	02.01.93	30 06.95	X	-

MKOANI							
18	Moh'd Juma Khamis	Hydrogeologist	Std VIII	01 01 94	30.06 95	X	-
19	Moh'd Maktub Farajı	Plumber	Std I	02 01 93	30.06 95	X	-
20	Moh'd Khalfan Said	Asst. Plumber	Std I	02.01.93	30 06 95	x	-
21	Abdulkadır A Kadır	Water Technician	Full Technician Certificate	01 08 91	30.06 95	X	-

STORE & GARAGE

NO	NAME	JOB TITLE	EDUCATION	PERIOD OF EMPLOYMENT		SECONDED	DIRECT EMPLOYED
				FROM	TO		
01	Masoud Juma Simba	Store Keeper	Form IV	01 08 91	30.06 95	X	-
02	Rashid Suleiman Rashid	Driver	Std IV Certificate	01-05 92	30 06 95	X	-
03	Mussa Khamis Hamad	Driver	Std IV	17 06 92	30 06 95	-	X
04	Said Salim Hemed	Driver/Mechanic	Form III	01 08 91	30 06.95	-	X
05	Khamis Khatib Ali	Driver	-	01 06 94	30.06 95	X	-
06	Haroun Bakar Juma	Tractor Driver	Std IV	01 06 94	30 06 95	X	-

ADVISER'S RESIDENCE

NO	NAME	JOB TITLE	EDUCATION	PERIOD OF EMPLOYMENT		SECONDED	DIRECT EMPLOYED
				FROM	TO		
01	Masoud Tamim Alia	Watchman	Std I	30 11 91	30 06 95	-	X
02	Mbarouk Slim	Watchman	Std I	09 11 91	30.06.95	-	X
03	Khamis Hamad	Watchman	Std I	28 09.92	30.06.95	-	X
04	Othman Abdalla Omar	Watchman	Std I	30 11 93	30.06 95	-	X

PUMPING STATIONS

NO	NAME	JOB TITLE	EDUCATION	PERIOD OF EMPLOYMENT		SECONDED	DIRECT EMPLOYED
				FROM	TO		
			CHAKE CHAKE				
01	Kombo Ali Rajab	Pumper	Std VI Certificate	01 11 93	30.06.95	X	-
02	Ahmed Moh'd Yahya	Pumper	Form III	01 11.93	30 06 95	X	-
03	Salim Moh'd Juma	Pumper	Form III	01 11.93	30.06 95	X	-
04	Said Amour Moh'd	Pumper	Form III	01 11 93	30.06.95	X	-
05	Omar Thiney Abeid	Pumper	Form III	01 11 93	30 06 95	X	-
			WETE				
06	Ahmed Haji Ahmed	Pumper	Form I Certificate	01.11.93	30 06 95	X	-
07	Mkubwa Kh Ahmed	Pumper	Std VI	01.11 93	30.06.95	X	-
08	Omar Seif Said	Pumper	Std II	01 11 93	30 06 95	X	-
09	Mbarouk M Khamis	Pumper	Std II	01 11 93	30 06 95	X	-
10	Mbarouk N Said	Pumper	Std II	01.11.93	30.06 95	X	-
			MKOANI				
11	Ali Moh'd Juma	Pumper	Std VIII	01 11 93	30.06.95	X	-
12	Awesi Omar Ali	Pumper	Std VIII	01 11 93	30 06 95	X	-
13	Bakar M. Kombo	Pumper	Std VIII	01 11.93	30 06 95	X	-
14	Khatib I Maalim	Pumper	Form III	01 11.93	30 06.95	X	-
15	Miraji A Moh'd	Pumper	Form IV	01 11 93	30 06 95	X	-

EXPATRIATE ADVISORY STAFFING

Annex 4

Name	Title / Position	Period	1991 8 9 10 11 12	1992 1 2 3 4 5 6 7 8 9 10 11 12	1993 1 2 3 4 5 6 7 8 9 10 11 12	1994 1 2 3 4 5 6 7 8 9 10 11 12	1995 1 2 3 4 5 6
Eero Meskus	Project Coordinator	27 9 1991 - 18 12.1993	XXXXXX	XXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX		
Timo Tuominen	Project Coordinator	6.1.1994 - 30 4 1995				XXXXXXXXXXXXXXXXXXXX	XXXXXXX
Osmo Seppälä	Water Supply Adviser / Chief Technical Adviser	21.7 1993 - 30.4.1995 1 5 1995 - 30 6 1995			XXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXX XXXX
Tuire Nikulainen	Management Consultant	1.8.1991 - 3 2 1993	XXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXX		
Ulla Parviainen	Management Adviser	22 2 1995 - 24 3 1995 18 4 1995 - 24 5 1995					XXX XX
Heimo Ojanen	Water Supply Engineer	1 8 1991 - 31.7 1993	XXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXX		
Pekka Riepäs	Operation & Maintenance Engineer	17 3 1992 - 3 10.1993		XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX		
Jukka Leppanen	Construction & Civil Works Adviser	30 6 1993 - 31 12 1993			XXXXXXXXXXXX		
Risto Kallio	Construction & Civil Works Adviser	17.2 1994 - 30 11 1994				XXXXXXXXXXXXXXXX	
Pekka Pouttu	Construction & Civil Works Adviser (Stone Town)	21 3 1994 - 22 12 1994				XXXXXXXXXXXXXXXX	
Asko Uusimaki	Electrical Engineer	1.1 1993 - 4.7 1993			XXXXXXXXXXX		
Yrjo Honkanen	Electro-Mechanical Engineer	10 3 1994 - 29.12 1994				XXXXXXXXXXXXXXXXX	
Pertti Murtovaara	Drilling Adviser	8.1 1992 - 19.12 1994		XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	
Eero Mäkinen	Construction & Maintenance Technician / Workshop Adv	8.9 1991 - 30.4.1995	XXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXX
Teuvo Kuusela	Network Technician / Resident Adviser (Pemba)	1 8 1991 - 16 12.1994	XXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	
Urpo Ettala	Resident Adviser (Pemba)	30.1.1995 - 30.6.1995					XXXXXXXXX
Pasi Lehmusluoto	Environmental & Laboratory Adviser	20 5 1993 - 22 6.1993 7 6 1994 - 27 6.1994			XXXX	XXX	
Jaana Pasanen	Environmental Specialist	22 1 1992 - 4 3 1992		XXXX			
Antti Ala-Kurikka	Electrical Adviser	24 10 1991 - 26 11 1991 9.3 1992 - 26.3 1992	XXXX	XXX			
Rob Robelou	Commissioning Engineer	8 1 1992 - 14 1 1992		X			
Tuula Ruokoski	Accountant	15 5 1993 - 30 5 1993			XX		
Esa Ovaskainen	Home Office Coordinator / Hydrogeologist	1 8.1991 - 30.6.1995	xxxxxxxxxxxx	xxxxxxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxxxxxx	xxxxxxxxxxxx
Sirkku Koivisto	Home Office Secretary	1 8.1991 - 30 6 1995 4 3 1992 - 17 3.1992	xxxxxxxxxxxx	xxxxxxxxxxxxxxxxxxxxxx XX	xxxxxxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxxxxxx	xxxxxxxxxxxx

TRAINING ACTIVITIES
1991 - 1995
(Short courses)

NAME	TIME / PERIOD	COURSE ATTENDED	INSTITUTE	SPONSOR
Mohamed Abdalla Mohamed Mzee Mpatani Ali Hemed Salim Hemed Hamad Juma Bakar	14.-25.1.1991	Course on Word Perfect Programme	Karume Technical College, Zanzibar	ZUWSP / GoF
Hamad Juma Bakar	12.-15 3.1991	Course on Basic Language	Karume Technical College, Zanzibar	ZUWSP / GoF
Haula Kassim Issa Mohamed Abdalla Mohamed	22.7.-2.8.1991	Workshop on Effectiveness in Personnel Management	Institute of Financial Management, Dar es Salaam	ZUWSP / GoF
Hemed Salim Hemed	29.7.-16.8.1991	Seminar on Performance Appraisal	Eastern and Southern African Management Institute (ESAMI), Arusha	ZUWSP / GoF
Hamad Juma Bakar	5.-9.8.1991	Workshop on Water Monitoring Systems	UNICEF, Arusha	ZUWSP / GoF
Haula Kassim Issa	10.-14.12.1991	Study visit to KFWWSP, Kakamega, Kenya	KFWSSP (Kefinco), Kakamega, Kenya	ZUWSP / GoF

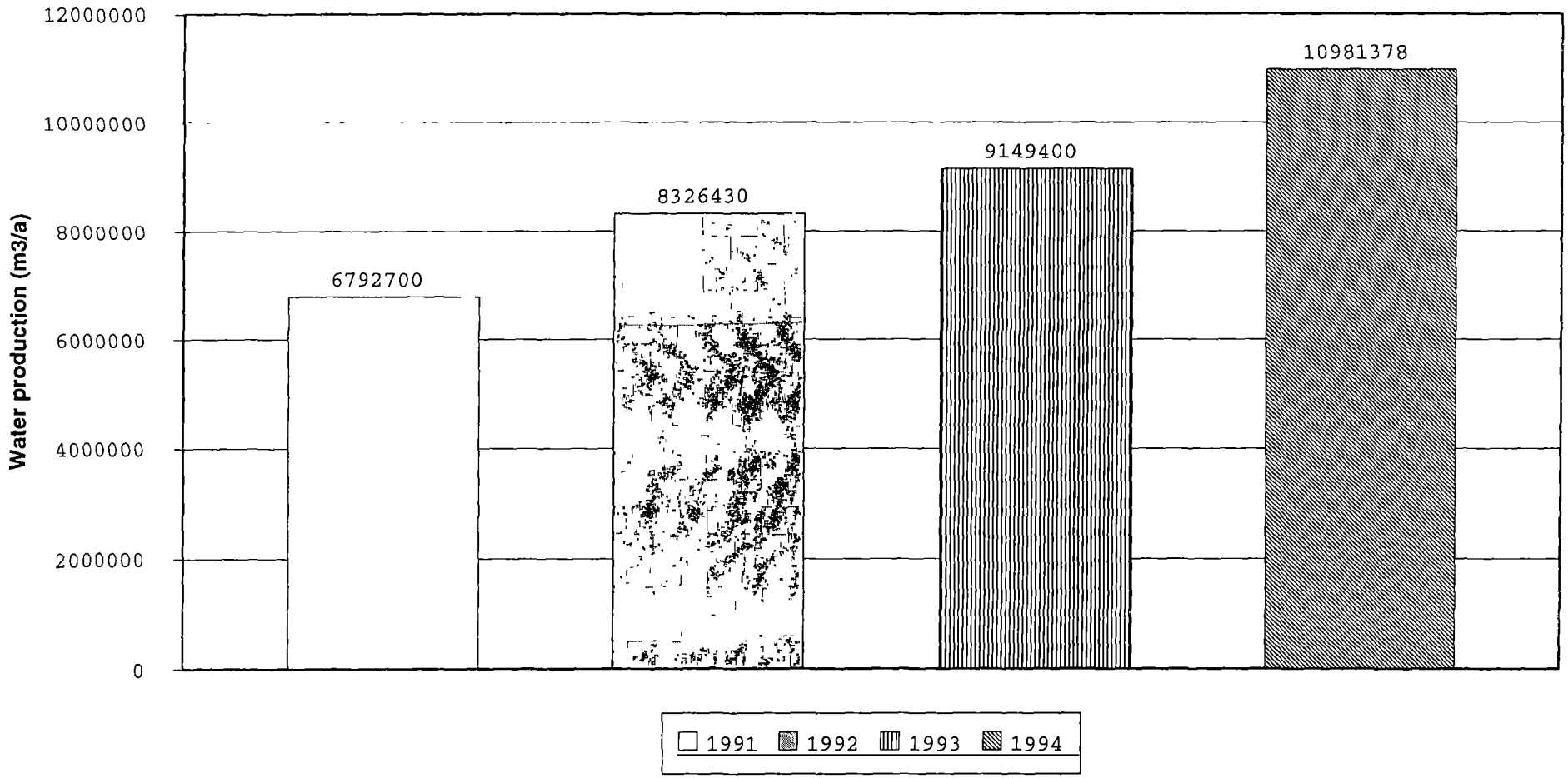
TRAINING ACTIVITIES
1991 - 1995
(Short courses)

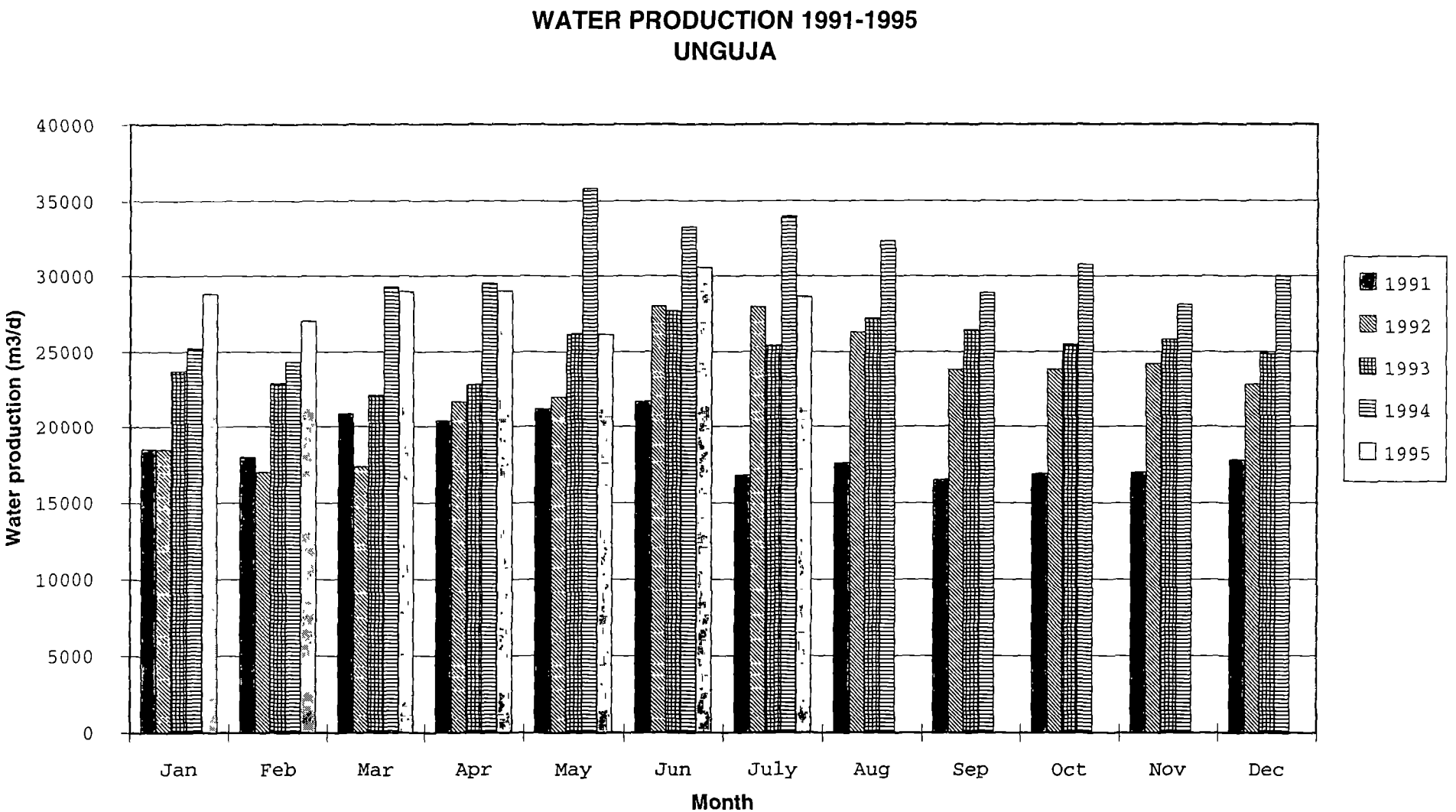
NAME	TIME / PERIOD	COURSE ATTENDED	INSTITUTE	SPONSOR
Workshop and Stores staff	1992	Study visit to KFWWSP, Kakamega, Kenya	KFWSSP (Kefinco), Kakamega, Kenya	ZUWSP / GoF
Hamad Juma Bakar	1992	Striving for Excellence in Management	Eastern and Southern African Management Institute (ESAMI), Arusha	ZUWSP / GoF
Mussa Ali Shehe	2.-17.12.1992	Seminar on Public Relations Techniques	Institute of Finance Management (IFM), Dar es Salaam	ZUWSP / GoF
Mussa Ali Shehe	2.-14 7.1993	Seminar on Basic News Writing	Tanzania School of Journalism, Dar es Salaam	ZUWSP / GoF
Saleh Mzee Saleh Haji Khamis Haji	1994 (6 weeks)	Refresher Course in Hydrogeology	Water Resources Institute, Dar es Salaam	ZUWSP / GoF
Bakar Juma Bakar	1994 (2 weeks)	Contracts and Construction Management	University of Dar es Salaam, BICO, Dar es Salaam	ZUWSP / GoF
Mariam Hassan	18 4.-3.6.1994	Water Resources Management in Developing Countries	Lund University of Technology, Sweden	Swedish Board for Inv. and Technical Support (BITS)

TRAINING ACTIVITIES
1991 - 1995
(Short courses)

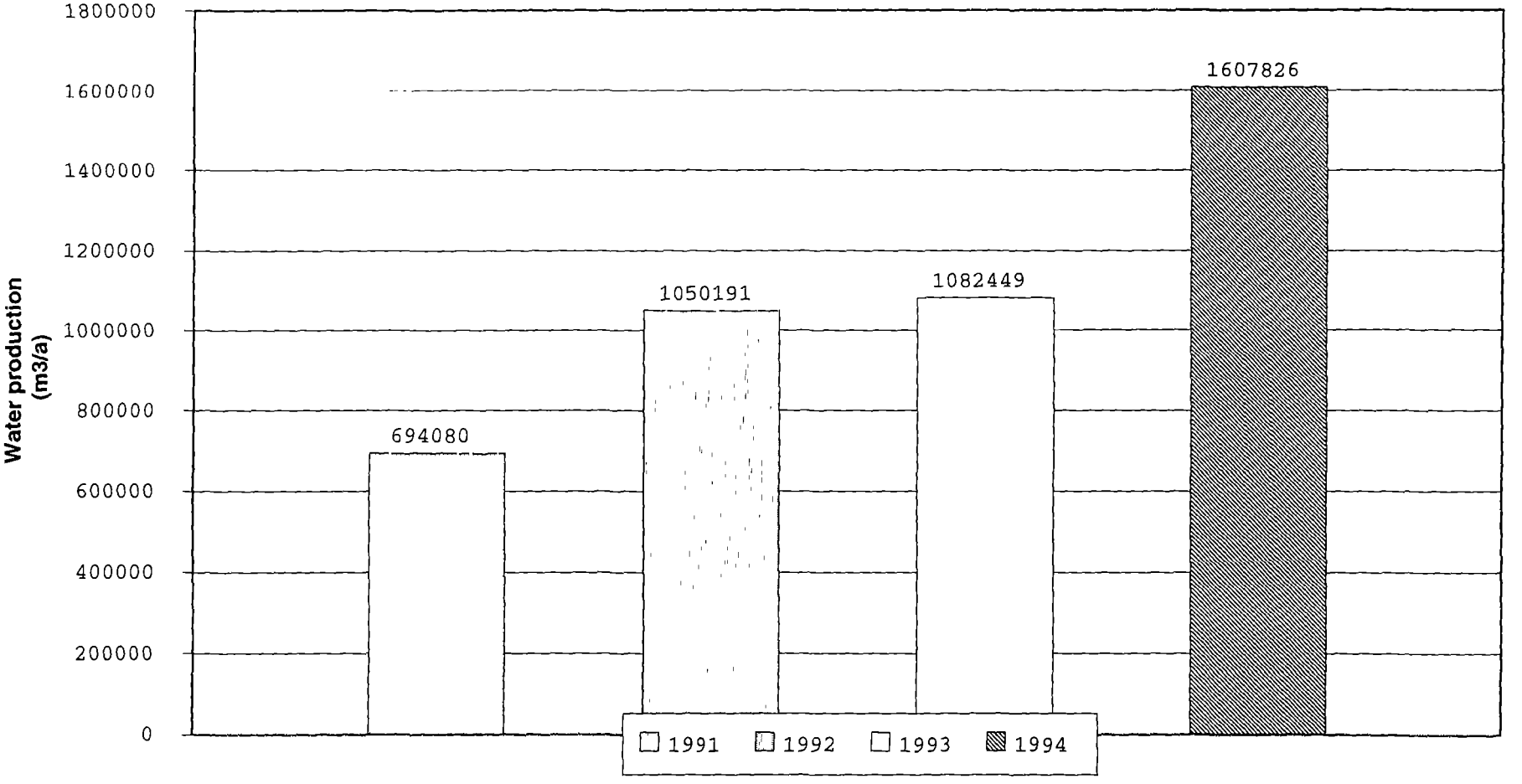
NAME	TIME / PERIOD	COURSE ATTENDED	INSTITUTE	SPONSOR
Hamad Juma Bakar	29.8.-6.10.1994	Management of Ground Water Supply for Urban Areas	Chalmers University of Technology, Gothenburg, Sweden	Swedish Board for Inv. and Technical Support (BITS)
4 Supervisors and 10 Foremen of all ZUWSP units	1994	Tailor made Course on Supervision Management	Water Resources Institute, Dar es Salaam	ZUWSP / GoF
8 Heads of UWSS Units	1994	Basic Computer Course	Modern Computer Centre, Zanzibar	ZUWSP / GoF
Mechanics and Workshop Staff	1995 (2 weeks)	Valmet tractor maintenance and repairs course	Zanzibar Tractor Repair Workshop, Mbweni, Zanzibar	ZUWSP / GoF

ANNUAL WATER PRODUCTION 1991-1994
UNGUJA




WATER PRODUCTION 1991-1995
UNGUJA
Water production (m3/d)
40000
35000
30000
25000
20000
15000
10000
5000
0
Jan
Feb
Mar
Apr
May
Jun
July
Aug
Sep
Oct
Nov
Dec
Month
1991
1992
1993
1994
1995

ANNUAL WATER PRODUCTION 1991-1994
PEMBA



LOCAL COMPONENT PAYMENTS DURING PHASE 1 (1991-1995):

Date	Amount (TZS)	Balance (TZS)
-	-	126.000.000,-
3 / 1991	3.500.000,-	122.500.000,-
5 / 1991	5.000.000,-	117.500.000,-
7 / 1991	1.460.000,-	116.040.000,-
10 / 1991	5.000.000,-	111.040.000,-
11 / 1991	10.000.000,-	101.040.000,-
(Total 1991	24.960.000,-	101.040.000,-)
5 / 1992	10.000.000,-	91.040.000,-
6 / 1992	3.439.052,-	87.600.948,-
6 / 1992	7.000.000,-	80.600.948,-
(Total 1992	20.439.052,-	80.600.948,-)
9 / 1993	2.000.000,-	78.600.948,-
(Total 1993	2.000.000,-	78.600.948,-)
17.05.1994	5.000.000,-	73.600.948,-
15.12.1994	10.000.000,-	63.600.948,-
(Total 1994	15.000.000,-	63.600.948,-)
06.02.1995	15.000.000,-	48.600.948,-
10.04.1995	5.000.000,-	43.600.948,-
10.06.1995	10.000.000,-	33.600.948,-
(Total 1995	30.000.000,-	33.600.948,-)
Total 1991-1995	**92.399.052,-**	**33.600.948,-**

ANNEX 8

MINUTES OF THE STEERING COMMITTEE MEETING 2/1994 OF ZANZIBAR URBAN WATER SUPPLY PROJECT

The Steering Committee of the Zanzibar Urban Water Supply Project held its second meeting for year 1994 on December 14, 1994 at the Bwawani Hotel.

The meeting began at 10 a m and was attended by the following members

1.	Mr. Muhammad Salim Sulaiman	-	Chairman, Principal Secretary , MWCELE
2.	Mr. Muhammed Khamis Kankuni	-	Deputy Principal Secretary , MWCELE
3.	Mr. Moh'd Nassor Habsy	-	Water Adviser
4.	Mr. Juma Khamis Juma	-	Director for Planning and Administration, MWCELE
5.	Mr. Mzee Mpatani Ali	-	Secretary, Ag. Director for Department of Water Development (DWD)
6.	Mr. Mussa Ali Shehe	-	Public Relations Officer, Urban Water Supply Section, ZUWSP
7.	Ms. Fatma Gharib Bilali	-	Ministry of Finance
8.	Mr. O.M. Simba	-	Budget Department, Ministry of Finance
9.	Mr. Mbarouk Omar Moh'd	-	Director of Sectoral Planning, Ministry of Planning
10.	Mr. Jorma Suvanto	-	Second Secretary , Embassy of Finland, Tanzania
11.	Mr. Timo Tuominen	-	Project Coordinator, ZUWSP, Zanzibar
12.	Mr. Osmo Seppala	-	Water Supply Adviser, ZUWSP, Zanzibar

1. OPENING OF THE MEETING

The Chairman opened the meeting and welcomed the participants. The agenda for the meeting was presented to the members of the committee for approval before the discussion. The agenda was accepted with the change to combine the second part of item 4 with item 9.

2. MINUTES OF THE PREVIOUS MEETING

The minutes of the previous Steering Committee meeting (20 January, 1994) were intoduced and checked by the participants The following observations and matters were raised from the minutes

- The idea of Steering Committee members to be familiarized with the project activities through field visits was reminded.

- Questions were made on item 5 (Human resources, staffing and training), especially on the previously mentioned practice of recruiting retired government officers into the project instead of young empoyees. The current situation with recruitment was explained by the project representatives. No retired government officers have been recruited, except the senior accountant (retired from a bank) in the beginning of the project. The current situation was observed satisfactory.

- Inquiries were also made on the staff training, especially why some project staff are trained abroad instead of using local or regional training facilities. It was explained by the project representatives that equivalent training is not available locally or regionally in these cases.

3. STATUS REPORT

The project status report by the end of November 1994 was presented and discussed.

The following observations and comments were made on the status report :

The structure of the status report should be more informative, e.g. including more tables and graphs to visualize the progress more clearly.

The progress in the Economic and Institutional Development component was found partly unsatisfactory. The Chairman proposed that a time schedule to achieve the set objectives should be defined by the Steering Committee. To prepare the required background documents and actual legislation, a legal adviser may be contracted e.g. through the Attorney General Chambers.

A question was raised on how well the training actually implemented within the project has responded to the training and staffing needs defined earlier. The project representatives elaborated the training plans and achievements.

Practical results and achievements of the Water Loss Reduction Strategy were asked. The work done so far was explained by the project representatives. The strategy prepared gives guidelines for future action, both technically and institutionally, but implementation of the Water Loss Reduction Programme still remains to be done. Illegal connections were also discussed in this connection. The strategy includes consideration of illegal connections as well.

Within Water Resources and Environmental Development Component it was asked, how ground water level and quality monitoring data will be compiled and reported It was assumed that in addition to the Annual Report a separate summary report may be compiled by the concerned section

Use of project funds by the end of October 1994 was presented by the Project Coordinator Questions were raised e g on the local component disbursement figures for year 1993/94. According to the Ministry of Finance's summary the disbursement should be TZS 10 8 million instead of TZS 2 million shown by the project

4. CONTINUATION OF THE PROJECT

The Chairman and the representative of FINNIDA (Embassy of Finland) elaborated the situation with the continuation of the project Based on the request by the Government of Zanzibar FINNIDA has accepted to continue Phase I of the project with a Transition Period during January - June 1995 Financing of the Transition Period is secured through the previous budget allocations which have been cut and saved from previous years.

FINNIDA has authorized the Embassy of Finland to sign the agreement of the Transition Period on behalf of the Finnish Government.

5. WORK PLAN FOR JANUARY - JUNE 1995

The First Draft of the Work Plan 1995 (Transition Period), dated 21 November 1994, had been sent to the members for review and commenting. The Second Draft, dated 6 December 1994, was distributed to the members a few days before the meeting. The Second Draft is an improved version, based on the few comments received for the First Draft.

The Project Coordinator introduced briefly the Work Plan and especially the amendments done for the Second Draft. The members were asked to comment and discuss the Work Plan. The following comments were raised

Mr Suvanto mentioned that he had a number of observations and comments for the First Draft, but it seemed that the Second Draft had already taken into account most of his comments He said that the Second Draft is improved and he is ready to accept the Work Plan according to the Second Draft. However, he said that FINNIDA headquarters has not yet received the Second Draft. Therefore, FINNIDA's approval is subject to the comments to be given by its headquarters. There seems not to be any need to arrange another meeting to approve the Work Plan, but FINNIDA's comments can be incorporated into the Work Plan when they are available.

Mr Suvanto stressed a few issues which are important and should be emphasized in the Work Plan. The activities and efforts in Economic and Institutional Development should be given high priority during the Transition Period Participatory implementation of the water supply systems should also be given a lot of attention

Mr Habsy asked about the planning criteria for water demand, whether 50 litres per capita has been used. He did not agree that the present water production could theoretically satisfy the demand The project representatives clarified that the first paragraph of the Strategy chapter in fact emphasizes the poor situation with the distribution system, water losses and uneconomic water use, rather than stating that there is no need to increase water production in the near future.

6. STAFFING AND HUMAN RESOURCES ISSUES

The Project Coordinator briefed the members about the project's staffing situation and staffing plan for the Transition Period. Total number of Zanzibari staff will be about 160 and expatriate advisory staff altogether five (four long-term and one short-term adviser).

Mr Suvanto expressed his concern about the advisory staffing situation in Pemba, especially if there will be a considerable gap before the new adviser will arrive The Project Coordinator explained that the recruitment process is already in an advanced stage, but due to formalities there may be gap of one to two months This will be taken care by more frequent visits to Pemba by other advisers

7. INSTITUTIONAL AND ECONOMIC DEVELOPMENT

The Chairman elaborated the situation with the proposed ADB financed Institutional Support Consultancy This consultancy seems to be stuck, because ADB has not allowed the Ministry to enter into an agreement with the proposed consultant (Plancenter Ltd), even though they had earlier directed the Ministry to do so in writing ADB has based its suspension on two reasons · 1) waiting for the Zanzibar Government to proceed with policy and legislation issues before starting the consultancy 2) wishing to arrange international retendering on the consultancy MWCELE has not received any reply from ADB since sending their letter explaining the situation and the wishes of the Government of Zanzibar to expedite this consultancy. The Zanzibari authorities are considering both to continue correspondence with ADB and to send a delegation to Abidjan to discuss with ADB staff

Mr Mpatani introduced the achievement and the progress of the Task Force on institutional and economic issues The Interim Report (September 1994) was introduced and discussed. It was concluded that the Task Force had failed in some of its objectives. The time schedule set for the Task Force to prepare a Cabinet Paper in February 1994 was considered too optimistic. Failure to reintroduce general water charges in 1994/95 budget was considered to be caused by the President's statement before the budget session

The members concluded that the objectives of the Task Force are still valid and the Task Force work should be reactivated soon. A revised time schedule for the Task Force should be made. The Task Force should make preparations and follow up the economic and institutional reforms during the Transition Period These reforms and activities will also be essential preconditions for commencing Phase 2 of the project

It was proposed that the project or DWD should engage a legal adviser or consultant to prepare the required legal documents and draft legislation during the Transition Period The Chairman was referring to the experiences of ZILEM project and was proposing e g a person from the Attorney General Chambers to be attached as a local consultant.

It was recognized that due to the coming national elections it may be difficult to get new laws or acts approved, especially after June 1995 Therefore it was emphasized that all preparations and decisions requiring parliamentary approval should be completed preferably by the end of March 1995.

8. LOCAL FINANCING

By the end of November 1994 the pending amount of Local Component payments is about TZS 74 million. It was mentioned that in December 1994 altogether TZS 10 million had already been paid

The representatives of the Ministry of Finance told that there is an installment programme to release TZS 5 million weekly

9. PREPARATIONS FOR PHASE 2

Mr Mpatani introduced the situation and progress with preparation of the Project Document for Phase 2 (1995-97). The First Draft is ready and has been submitted for comments to FINNIDA and to Ministry of WCELE in November 1994. Other relevant authorities will be given the First Draft for comments immediately

Mr Suvanto mentioned that he has not yet gone through the First Draft in detail. Also comments from FINNIDA have not yet been received. Mr Sulaiman told that the First Draft is under review in MWCELE, but no comments have been obtained yet In general the meeting seemed to be satisfied and recognize the work of the Planning Team so far.

Mr Suvanto proposed the following time schedule for continuation of the project preparation :

- After receiving the comments the Final Draft Project Document should be made in January - February 1995
- Second workshop (if considered necessary) should be arranged in February 1995.
- Appraisal of the Final Draft Project Document would be made in March - April 1995.
- Final Project Document should be made by the end of May 1995.

Mr Suvanto said that project preparation for Phase 2 will be continued according to the proposed schedule, but commencement of the implementation of Phase 2 is subject to certain preconditions These preconditions are in principle the same which have been stated earlier. The following conditions should be met and substantial progress achieved during the Transition Period in the following issues :

- Pending Local Component payments to be fully paid.

- Cost recovery system to be improved and water charges to be reintroduced to all consumers.

- Preparations and administrative decisions made to establish a self-supporting, autonomous urban water supply organisation.

In addition to these main preconditions, Mr Suvanto raised a few issues that need special attention subject to continuation of FINNIDA's financing :

- The situation with illegal water connections should be improved. Improvements can be made through effecting the water works rules and strengthening the inspection systems.

10. ANY OTHER ISSUES

Mr Habsy reminded that the proposal to engage a legal adviser to the water sector (DWD or project) should be put forward soon.

The meeting was adjourned at 2 05 p.m.

For the minutes

.....	.....	.....
Chairman	Secretary	Embassy of Finland

SECOND STEERING COMMITTEE MEETING
OF THE ZANZIBAR URBAN WATER SUPPLY

The Steering Committee for the said project held its second session on 02.03.1993 at the Ministry of Water, Construction, Energy, Lands and Environment.

Participants

1.	Mr. Muhammad Salim Sulaiman	-	Chairman - MWCELE (Principal Secretary)
2.	Mr. Muhammad Khamis Kankun	-	Deputy Principal Secretary - MWCELE
3.	Mr. Moh'd Nassor Habsy	-	Water Adviser
4.	Mr. Abdalla Juma Khatib	-	Director for Planning and Administration
5.	Mr. Hemed Salim Hemed	-	Director for Water Department
6.	Ms. Haula Kassim Issa	-	Urban Water Section
7.	Mr. Abdi Khamis Faki	-	Acting Commissioner for Budget Control - Ministry of Finance
8.	Mr. Raphael	-	Director for External Finance - Ministry of Finance
9.	Mr. Heikki Wihuri	-	FINNIDA Advisor Helsinki
10.	Ms. Seija Kinni	-	Embassy of Finland Tanzania
11.	Mr. Esa Ovaskainen	-	Home Office Project Supervisor Plancenter, Helsinki
12.	Mr. Eero Meskus	-	Project Coordinator, Zanzibar

Absence with apology is:

Mr. Mbarouk Omar Moh'd - Ministry of Planning, Zanzibar.

AGENDA NO. 1 Mid-Term Review Mission's Report

The committee observed the following:

The Mission Team which was in Zanzibar for the review of the Project had come up with ideas and suggestions that are not differed from the guidelines stipulated in the project document.

The end of mission workshop resolutions support the establishment of the Urban Water Authority as well as in laying down proper project strategies for the achievement of both institutional building capacity and increase of water supply.

The reintroduction of the water charges for all customers is a good sign of building up a sustainable water system.

Besides that the Government has agreed in principle of the re-introduction of the tariff, the Steering Committee should take as the top priority to enable the UWSS to charge realistic rates for paying customers and to extend revenue collection gradually to all categories of consumers.

The local staff should be trained so as to enable them to run the project smoothly in future.

The groundwater and environmental protection of the water intakes had been strongly stressed by the Mission Team because the target of the on-going investment activities is the improvement of the water supply in the islands and this requires the safe-guard of actual resources against contamination and effects of human activities.

The committee agreed that what had been reported by the mission are the opinions of the Mission Team on the project strategies, hence they are recommendations, subject of approval of the both Governments.

AGENDA NO. 2 Annual Work Plan 1993

The draft of the plan was put before the members for the discussion and approval as the schedule for the 1993 implementation year.

The committee was convinced that there is a lack of some middle and senior level staff as the counterpart to the project. Due to their importance, proper plans have to be arranged so as to have the people coming from their studies as well as to train some to senior and executive posts.

In the work plan, it is proposed that the project is allowed to use revenue collected from the paying customers as part of local component due to Government of Zanzibar. The proposal is due to the delays in paying the local funds. However, the issue will be forwarded to the Ministry of Finance for more clarification.

In discussion pertaining the manning schedule and the budget, the committee agreed that the advisory staffing schedule should be revised until 1995. The number of the expatriates should be kept minimum and if additional expertise is required, the priority should be given to regional resources. As the main consultant is however responsible for actual implementation of the project, such persons or consultants have to be approved also by the main consultant, Plancenter Ltd.

On the implementation programme, it was passed that the schedule was to start in January, the delayed activities from January to March have to be carried forwards as planned. The consultant (Plancenter Ltd) was advised to consider sub-contracting of drilling works in order to speed up development of new sources in Zanzibar Town.

AGENDA NO. 3 Status Report of the Project

Introducing the status of the project, the project coordinator reported that soon after the approved of the implementation phase, there was first mobilization period and the actual implementation did start about eleven months ago.

Since then, 28 pumps (15 in Unguja and 13 in Pemba) have been installed in the existing boreholes, Saateni pumping station have been totally rehabilitated and installation of control and safety devices of pumping stations is in advanced stage.

The drilling exercise that was carried at Kijito Upele was completed for three boreholes. Due to their low yield, the boreholes are not sufficient for the Urban Water Supply Operation.

Major pipe works have not yet been started but main civil works, have been done in most of the pumping stations. There have been an intensive exercise of monitoring the water distribution to some areas so as to evaluate the supply system. The results show that there has been some improvement in the water supply in Zanzibar Town (estimated 40%) compared to the previous year, in Pemba reliability of pumping stations is increased but the actual water supply has not improved due to erratic power supply.

On the technical level the committee appreciates the status reached by project,however, as the end of the first phase (1993) is not very far, the more efforts have to be taken so that the beneficiaries should see the achievements obtained. The goal is to rehabilitate and improve the water supply as well as building a capable institution to run the established unit.

AGENDA NO. 4 Any Other Issues

The committee was informed that the Ministry of Water, Construction, Energy, Lands and Environment had arranged a monthly meeting with the project personnel so as to have a closer monitor to the progress of the project.

The Steering Committee was supposed to meet twice a year. However, it was accepted that the schedule to be flexible whenever there is a need to convene such meeting.

The meeting was adjourned at 2.15 p.m.

....

Chairman Secretary

AGREED MINUTES OF THE 3rd STEERING COMMITTEE MEETING

The Steering Committee for the Zanzibar Urban Water Supply Project held its annual meeting on January 20, 1994 at Bwawani Hotel.

The meeting which started at 10.00 am was attended by the following members:

1.	**Mr.Muhammad Salim Sulaiman**	-	**Principal Secretary** **MWCELE**
2.	**Mr. M. K. Kankuni**	-	**Deputy Principal Secretary** **MWCELE**
3.	**Mr. O. M. Simba**	-	**Budget, Department** **Ministry of Finance**
4.	**Mr. A. J. Khatib**	-	**Director of Planning** **MWCELE**
5.	**Mr. M. N. Habsy**	-	**Water Supply Adviser**
6.	**Mr. Timo Tuominen**	-	**Project Coordinator (CTA)** **ZUWSP**
7.	**Mr. Daud S. Daud**	-	**Ass. Administrative Officer** **ZUWSP**
8.	**Mr. Osmo Seppälä**	-	**Water Supply Engineer** **ZUWSP**
9.	**Mr. Julian B. Raphael**	-	**Director of External Finance,** **Ministry of Finance**
10.	Mr. Hemed S. Hemed	-	Director DWD
11.	Mr. Jorma Suvanto	-	Second Secretary (Dev. Cooperation) Embassy of Finland

Absentee with apology

1.	Mr. Mbarouk O. Moh'd	-	Director for Sectoral Planning Ministry of Planning

AGENDA

The agenda for the meeting was presented to the members of the committee for approval before the discussion. The agenda was accepted with the change to combine the item concerning Local Financing with the item on the Status Report.

1. OPENING OF THE MEETING

The Chairman opened the meeting. The participants were introduced and recorded.

2. MINUTES OF THE PREVIOUS MEETING

The agreed minutes of the 1993 session was presented to the Committee with the remarks that in every session:

- Matters arising from the previous meeting will be discussed.
- A summary report which reflects what has been able to be implemented from the approved schedule.
- Bottlenecks in the programme implementation should be reflected so that appropriate measures can be taken.

3 WORK PLAN 1994

The draft Work Plan 1994 (enclosed) was distributed in advance with the invitation to the members and was presented in the meeting.

The Work Plan was discussed.

In the Work Plan 1994, the objectives were not clearly stated, therefore, the Work Plan will be revised according to FINNIDA's guidelines in that respect.

The improvement of water supply services as well as the institutional capacity building are the main objectives of the project. However, it can be clearly observed that during the past two years of the project implementation improvement of water supply services has had a priority. The committee resolved that a corresponding weight should be given to the institutional capacity building.

The annual project budget (Appendix V) for 1994 was approved. The budget should be shown in quarterly expenditures. Also the annual budget for 1994 should be comparable to the annual budget given in the Project Document.

4. STATUS REPORT

The status report (enclosed), by the end of 1993 was presented and discussed.

The status of the project development is satisfactory, besides some problems in local financing and staffing. Rehabilitation of the existing water intakes, drilling activities, procurement of the water supply materials, rehabilitation of distribution network and activities on the human resources development have been in general well progressing.

The committee agreed that the public health education campaign as well as the creation of more awareness to the beneficiaries should be more emphasized.

The Committee appreciates the contribution from the Finnish Government. The local component support is behind the schedule which results to an outstanding amount of more than 40 million Shillings. However, this project is always given a priority by the Government of Zanzibar in funding. The Government of Zanzibar should put all the possible efforts in obtaining the pending amount of local contribution.

According to the representatives to the Ministry of Finance, local component payment of 29 million Shillings will be effective during January 1994.

5. HUMAN RESOURCES, STAFFING AND TRAINING

The Committee observed that the practise of recruiting retired government officers instead of young employees who are still the civil servants does not guarantee procedures of building up the institutional capacity enough to manage the sustainable water authority. More intensive recruitment of School and University leavers was recommended instead.

It was mentioned that the training programme has not adequately been oriented for the senior staff to take over the full responsibility of the project management. The project should look into its Training Programme so that the counterpart staff can take over the responsibilities from the expatriate advisory staff in a reasonable schedule. The Government was also requested to provide the necessary inputs on the local staff needed for the project.

Expatriate staffing schedule for 1994 (Appendix IV) was discussed and approved according to the proposal. Especially Construction & Civil Works Adviser for Stone Town, Electro-Mechanical Engineer as new posts and extension of the post of Drilling Adviser and three short term advisers were considered appropriate.

6. INSTITUTIONAL DEVELOPMENT

The status and plans for future activities of institutional development in the water sector was briefly introduced to the Committee members. African Development Bank (ADB) is financing Institutional Support Consultancy for the entire water sector (rural and urban water supply and sanitation), due to start in early 1994.

Institutional plans and development for the urban water supply done so far will be utilized in this consultancy. The aim will be to form one national entity for the whole water sector, with a common policy and different implementing departments for various sub-sectors.

7. POLICY ISSUES

It was reported to the Committee that proper strategies for the establishment of the Zanzibar Urban Water Authority as well as re-introduction of water tariffs to all consumers are still under process.

Successful completion of the first phase will be the best indicator for the continuation of this project for the second phase.

It is the responsibility of the recipient government to facilitate the obligations agreed right from the commencement of the project.

Re-introduction of water tariffs and establishment of Urban Water Supply Authority is a pre-condition for the continuation of FINNIDA financing for the Project.

The committee agreed that a comprehensive document, cabinet papers should be prepared to cover reinstating water charges, revised tariffs for all users, availability of own account for UWSS and establishment of Urban Water Supply Authority. For the preparation of the paper, the task force will be established and have the members from DWD, Ministry of Finance and Ministry of Planning. The Project should facilitate the task force with technical background material, like calculations on the real costs of the urban water services. The document should be ready by February 15, 1994 so that it can be channelled through the Zanzibari authorities for approval within the budget session.

8. ANY OTHER ISSUE

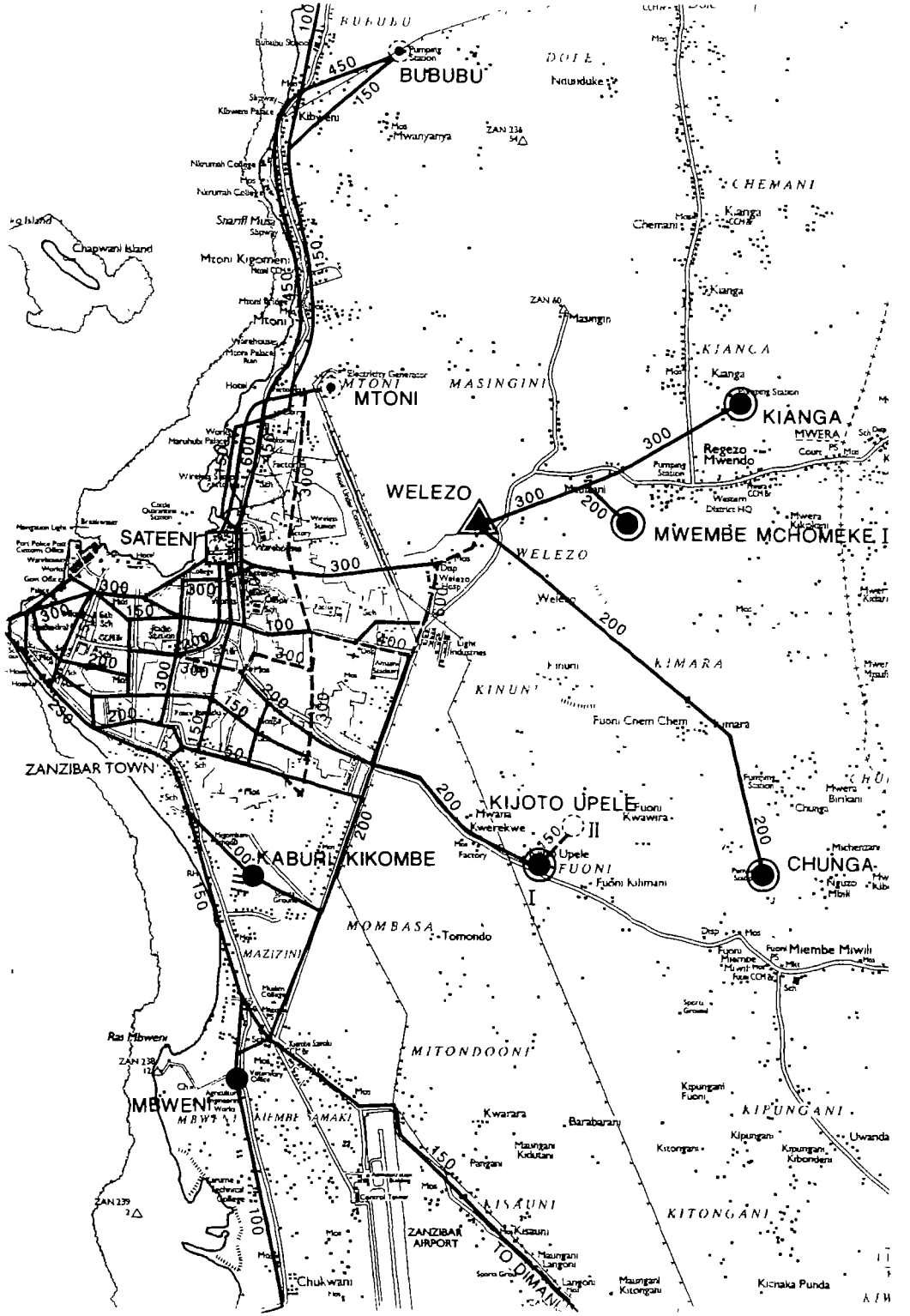
The Committee was informed of the proposal for preparation of the Project Document for the Second Implementation Phase which is scheduled to start in 1995. The Project Document will be prepared in Zanzibar. FINNIDA can provide the facilitator and the Project is assisting.

It was proposed that the Steering Committee members should be familiarized with the Project by arranging an introductory visit to the Project sites and activities.

The meeting was adjourned at 2.30 p.m.

For the minutes 29.01.1994.

Chairman	Secretary	Embassy of Finland



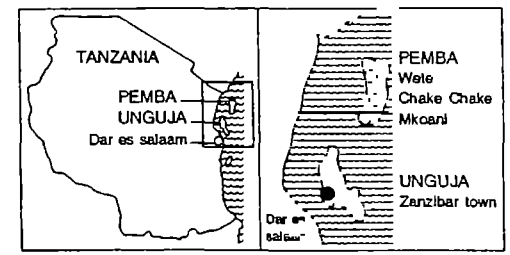
ZANZIBAR URBAN WATER SUPPLY PROJECT

ZANZIBAR TOWN, PHASE 1 1991-1995

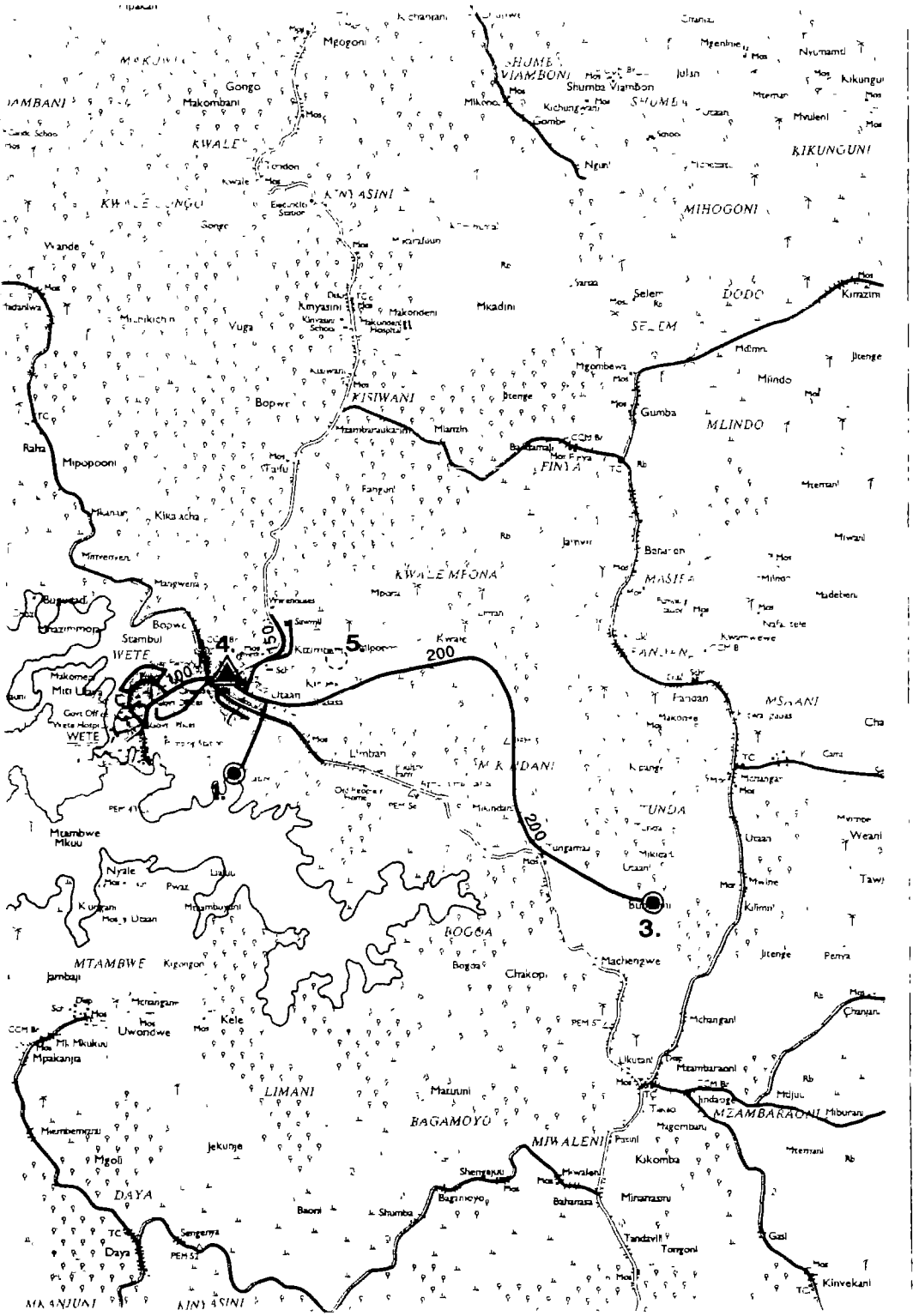
SCALE 1:50,000

LEGEND:

- INTAKE, EXISTING
- SPRING, EXISTING, PROPOSED FOR FURTHER DEVELOPMENT
- INTAKE, EXISTING, PROPOSED FOR FURTHER DEVELOPMENT
- RESERVOIR, EXISTING, PROPOSED FOR FURTHER DEVELOPMENT
- BOOSTER STATION, EXISTING, PROPOSED FOR FURTHER DEVELOPMENT
- 300 EXISTING PIPELINE AND PIPESIZE (mm)
- INTAKE, PROPOSED
- 400 PIPELINE, PROPOSED AND PIPESIZE (mm)



Projekt: ZANZIBAR URBAN WATER SUPPLY PROJECT, PHASE 1		Drawing title: ZANZIBAR TOWN, 1991-1995	Scale: 1:50,000
DEPARTMENT OF WATER DEVELOPMENT, ZANZIBAR	FINNIDA		
Consultant: PLANCENTER LTD	Original date 1995 Approved by	Planning field, project no, drawing no: 1544-09058-	Revision: FIGURE 1



ZANZIBAR URBAN WATER SUPPLY PROJECT

WETE TOWN, 1991-1995

SCALE 1 50,000

LEGEND.

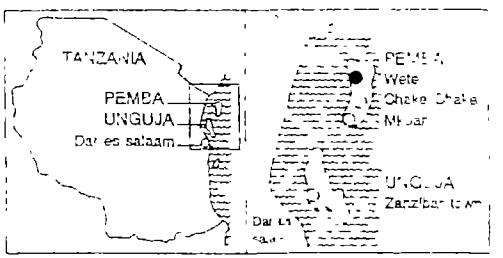
1. GAWANI INTAKE
3. BUNGUMI INTAKE
4. MTEMANI WATER WORKS
5. KWALE I INTAKE

◉ INTAKE, EXISTING, PROPOSED FOR FURTHER DEVELOPMENT

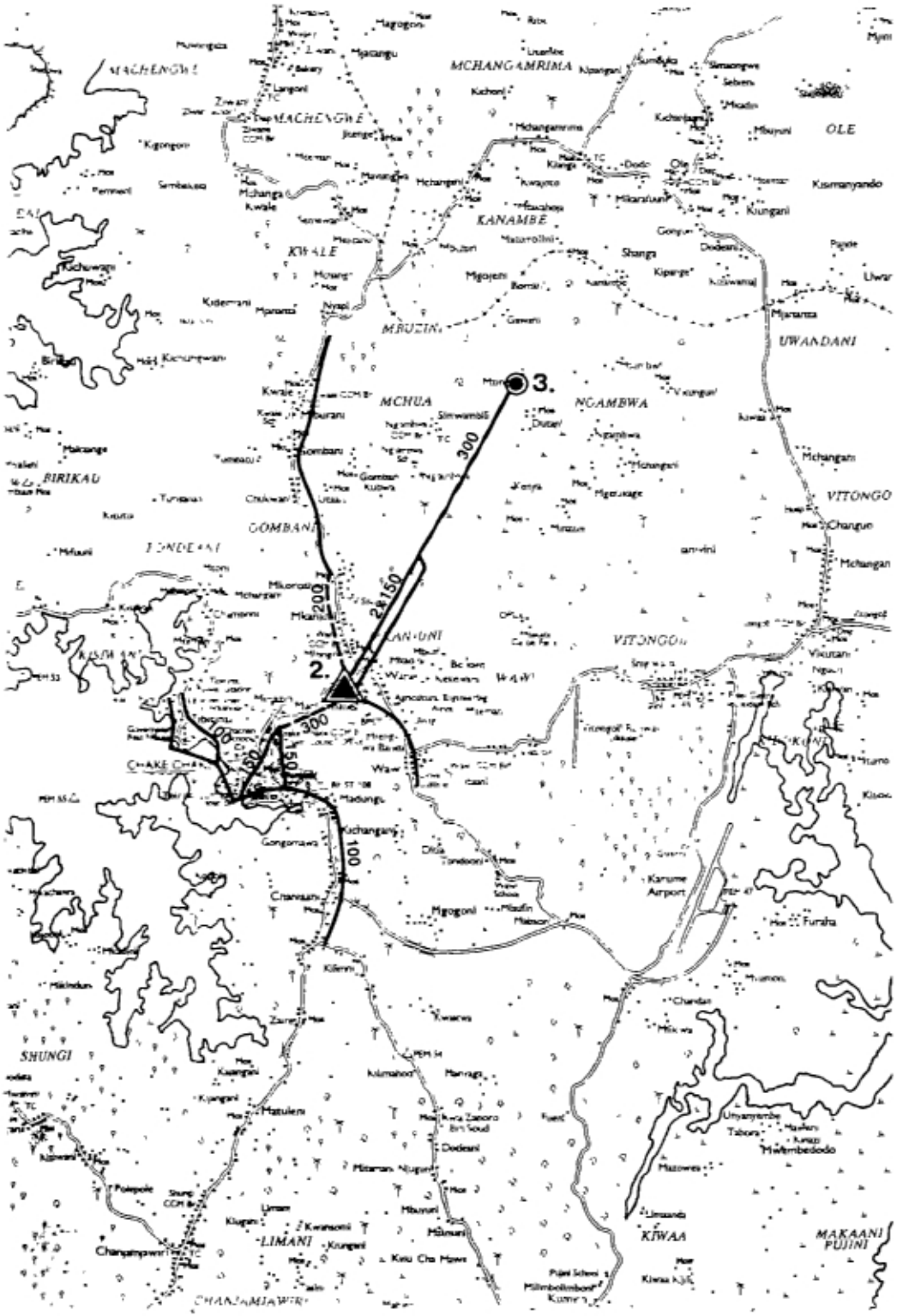
△ RESERVOIR, EXISTING, PROPOSED FOR FURTHER DEVELOPMENT

200 EXISTING PIPELINE AND PIPESIZE (mm)

◌ INTAKE, PROPOSED



Projekt: ZANZIBAR URBAN WATER SUPPLY PROJECT, PHASE 1		Drawing title: WETE TOWN, 1991-1995	Scale: 1:50,000
DEPARTMENT OF WATER DEVELOPMENT, ZANZIBAR	FINNIDA		
Consultant: PLANCENTER LTD	Original date 1995 Approved by	Planning field, project no, drawing no: 1544-09058-	Revision: FIGURE 2



ZANZIBAR URBAN WATER SUPPLY PROJECT

CHAKE CHAKE TOWN, 1991-1995

SCALE 1 50,000

LEGEND:

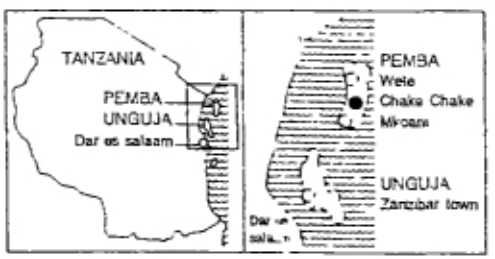
2. MACHOMANE WATER WORKS
3. KWAPWEZA I INTAKE

◉ INTAKE, EXISTING, PROPOSED FOR FURTHER DEVELOPMENT

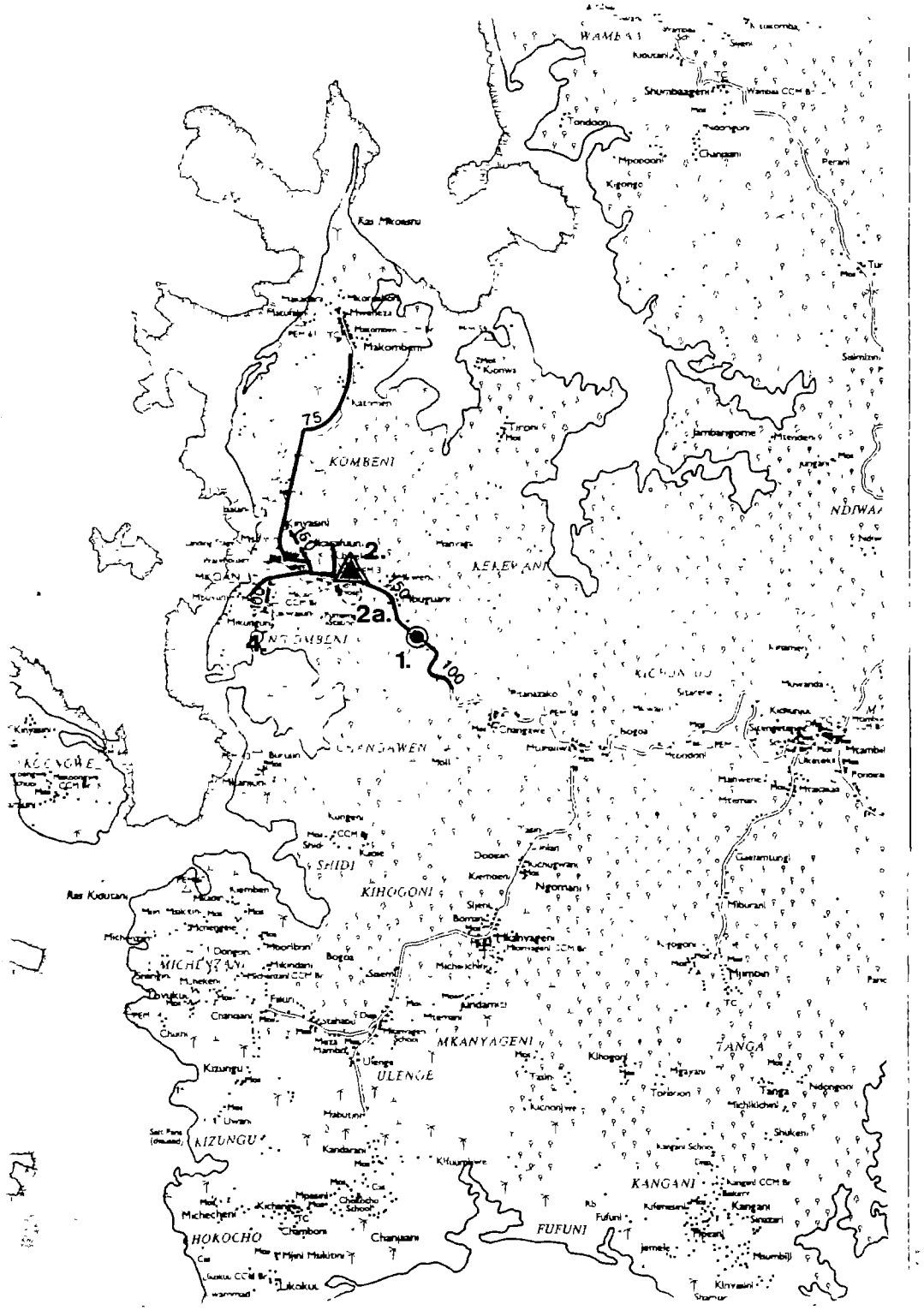
▲ RESERVOIR, EXISTING, PROPOSED FOR FURTHER DEVELOPMENT

150 EXISTING PIPELINE AND PIPESIZE (mm)

300 PIPELINE, PROPOSED AND PIPESIZE (mm)



Project: ZANZIBAR URBAN WATER SUPPLY PROJECT, PHASE 1		Drawing title: CHAKE CHAKE TOWN, 1991-1995 — Scale: 1:50,000
DEPARTMENT OF WATER DEVELOPMENT, ZANZIBAR	FINNIDA	
Consultant: PLANCENTER LTD	Original date 1995; Approved by	Planning field, project no, drawing no: 1544-09058- — Revision: FIGURE 3



ZANZIBAR URBAN WATER SUPPLY PROJECT

MKOANI TOWN, PHASE 1 1991-1995

SCALE 1.50,000

LEGEND:

1. CHANGAWENI INTAKE
2. UWELENI WATER WORKS
2a. UWELENI INTAKE
4. NGOMBENI INTAKE

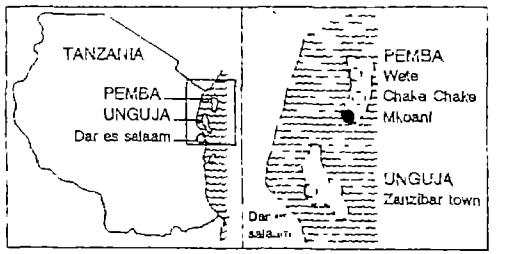
◉ INTAKE, EXISTING, PROPOSED FOR FURTHER DEVELOPMENT

▲ RESERVOIR, EXISTING, PROPOSED FOR FURTHER DEVELOPMENT

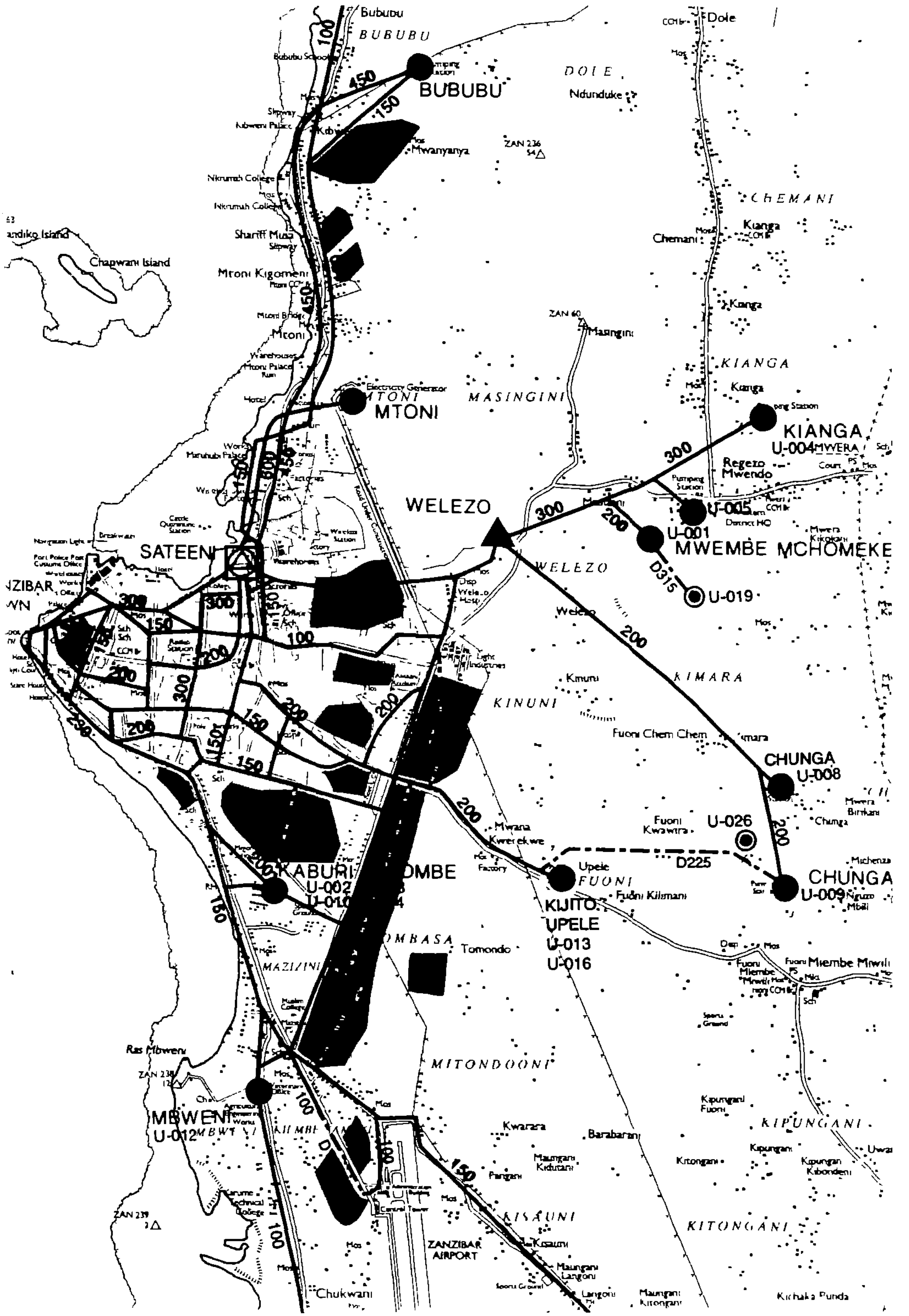
150 EXISTING PIPELINE AND PIPESIZE (mm)

○ INTAKE, PROPOSED

100 PIPELINE, PROPOSED AND PIPESIZE (mm)



Projekt: ZANZIBAR URBAN WATER SUPPLY PROJECT, PHASE 1		Drawing title: MKOANI TOWN, 1991-1995	Scale: 1:50,000
DEPARTMENT OF WATER DEVELOPMENT, ZANZIBAR	FINNIDA		
Consultant: PLANCENTER LTD	Original date 1995 Approved by	Planning field, project no, drawing no: 1544-09058-	Revision: FIGURE 4



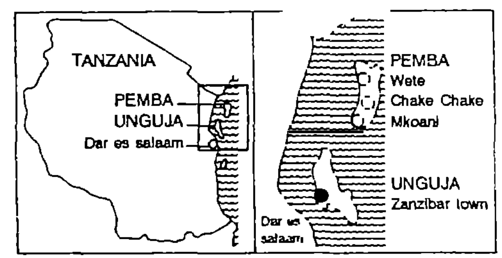
ZANZIBAR URBAN WATER SUPPLY PROJECT

ZANZIBAR TOWN, PHASE 1 1991-1995

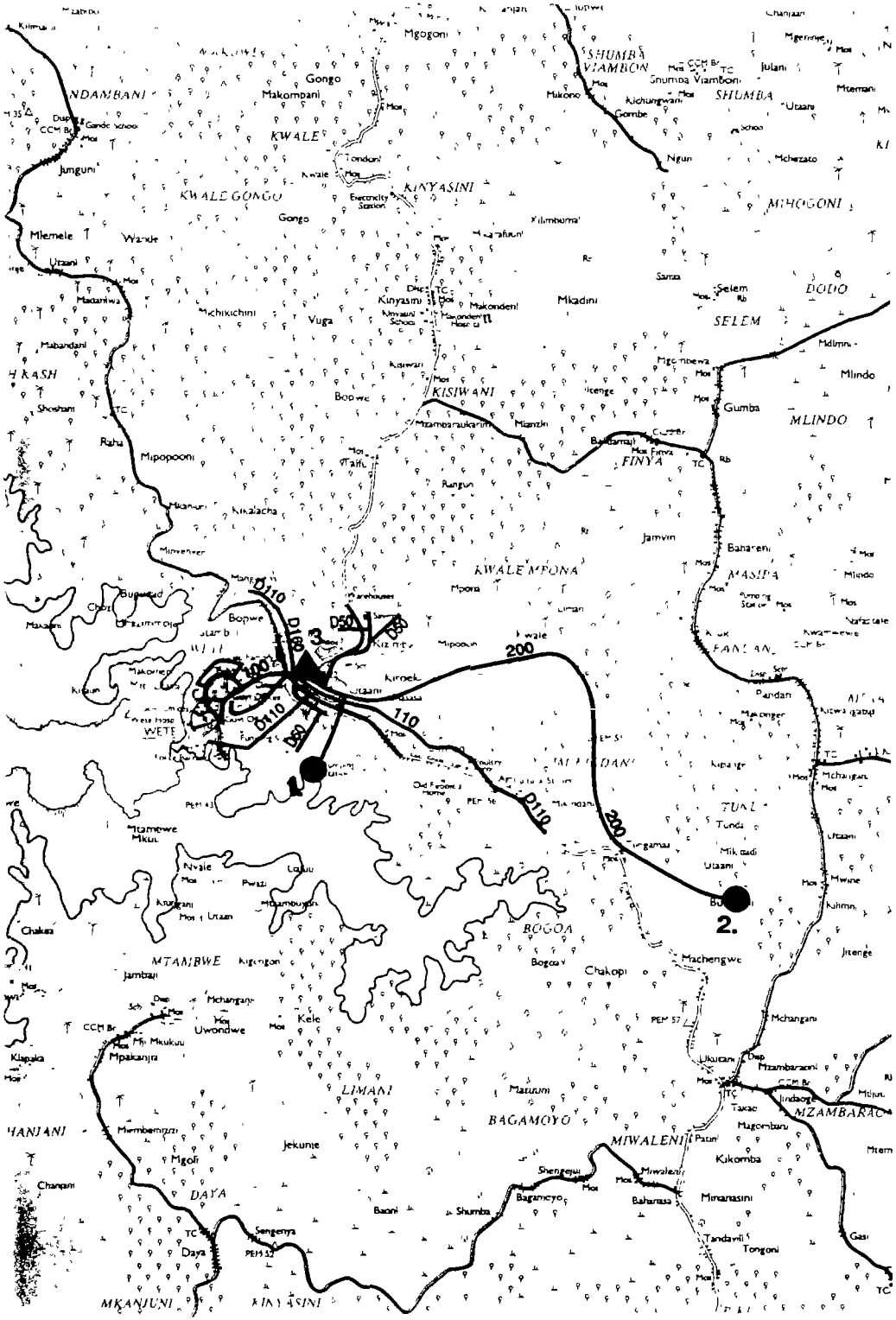
SCALE 1:50,000

LEGEND:

- INTAKE, EXISTING (REHABILITATED)
- NEW BOREHOLE INTAKE CONSTRUCTED
- RESERVOIR, EXISTING
- BOOSTER PUMPING STATION, EXISTING (REHABILITATED)
- 100 — EXISTING PIPELINE AND PIPESIZE (mm)
- D160 — NEW OR REHABILITATED PIPELINE AND PIPESIZE (mm)
- AREA WHERE DISTRIBUTION NETWORK REHABILITATION OR EXTENSION HAS BEEN MADE



Projekt		Drawing title	Scale
ZANZIBAR URBAN WATER SUPPLY PROJECT, PHASE 1		ZANZIBAR TOWN, 1991-1995	1:50,000
DEPARTMENT OF WATER DEVELOPMENT, ZANZIBAR	FINNIDA		
Consultant: PLANCENTER LTD	Original date 1995 Approved by	Planning field, project no, drawing no: 1544-09058-	Revision: FIGURE 5



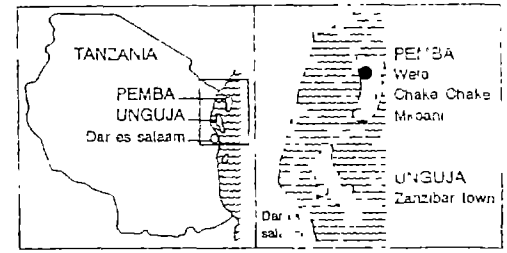
ZANZIBAR URBAN WATER SUPPLY PROJECT

WETE TOWN, PHASE 1 1991-1995

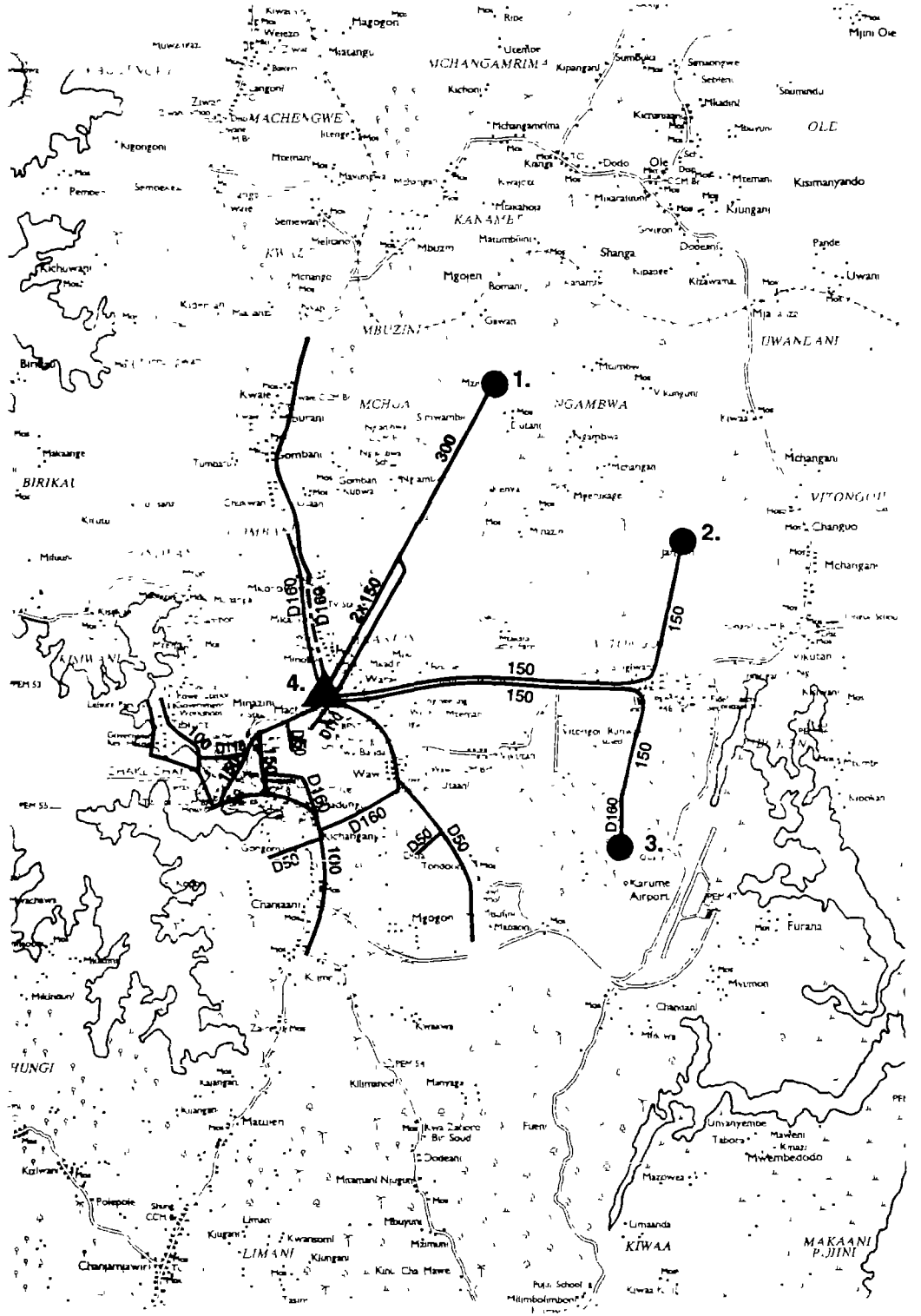
SCALE 1:50,000

LEGEND:

- ● INTAKE, EXISTING (REHABILITATED)
- 1. GAWANI INTAKE
- 2. BUNGUMI INTAKE
- ▲ RESERVOIR, EXISTING
- 3. MTEMANI WATER WORKS
- D200 EXISTING PIPELINE AND PIPESIZE (mm)
- D160 NEW PIPELINE AND PIPESIZE (mm)
- D50-D110 NEW PIPELINE AND PIPESIZE (mm)



Projekt: ZANZIBAR URBAN WATER SUPPLY PROJECT, PHASE 1		Drawing title: WETE TOWN, 1991-1995	Scale: 1:50,000
DEPARTMENT OF WATER DEVELOPMENT, ZANZIBAR	FINNIDA		
Consultant: PLANCENTER LTD	Original date 1995 Approved by	Planning field, project no, drawing no: 1544-09058-	Revision: FIGURE 6



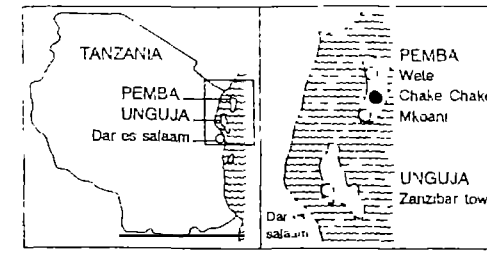
ZANZIBAR URBAN WATER SUPPLY PROJECT

CHAKE CHAKE TOWN, PHASE 1 1991-1995

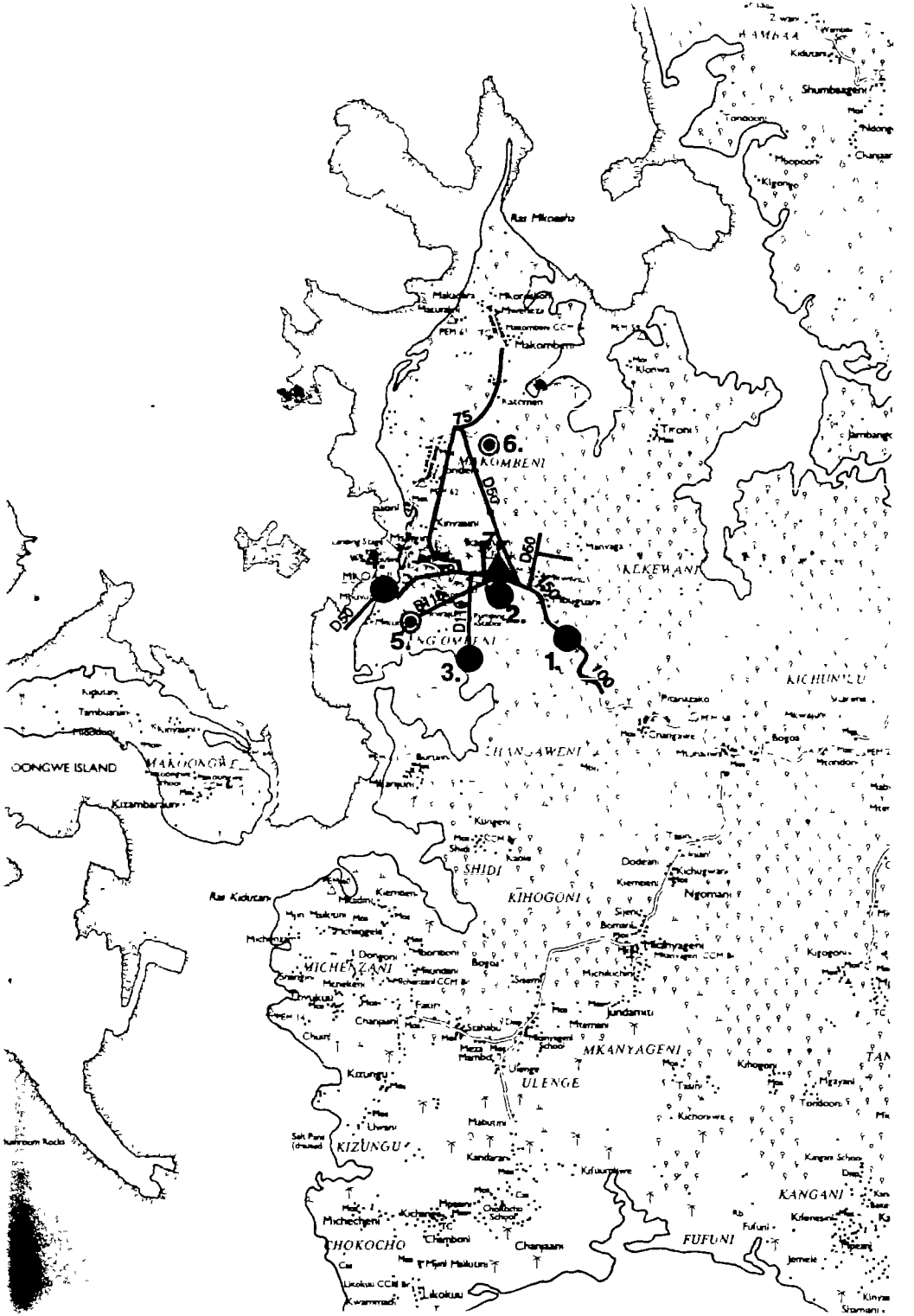
SCALE 1:50,000

LEGEND:

- ● INTAKE, EXISTING (REHABILITATED)
- 1. KWAPWEZA SPRING INTAKE (PC-09)
- 2. JAMVINI C7 INTAKE (PC-02)
- 3. CHANGARAWENI INTAKE (PC-03)
- ▲ RESERVOIR, EXISTING
- 4. MACHOMANE WATER WORKS
- D100- EXISTING PIPELINE AND PIPESIZE (mm)
- D160 NEW OR REHEBILITATED PIPELINE AND PIPESIZE (mm)
- D160 NEW PIPELINE AND PIPESIZE (mm)
- D50-D110 NEW PIPELINE AND PIPESIZE (mm)



Project: ZANZIBAR URBAN WATER SUPPLY PROJECT, PHASE 1		Drawing title: CHAKE CHAKE TOWN, 1991-1995	Scale: 1:50,000
DEPARTMENT OF WATER DEVELOPMENT, ZANZIBAR	FINNIDA		
Consultant: PLANCENTER LTD	Original date 1995 Approved by	Planning field, project no, drawing no: 1544-09058-	Revision: FIGURE 7



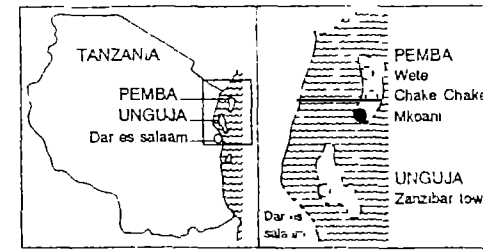
ZANZIBAR URBAN WATER SUPPLY PROJECT

MKOANI TOWN, PHASE 1 1991-1995

SCALE 1:50,000

LEGEND:

- ● INTAKE, EXISTING (REHABILITATED)
- 1. CHANGAWENI INTAKES
- 2. KIPITACHO (UWELENI) INTAKE
- 3. KIGUUNI SPRING INTAKE
- 4. COGEFAR (HARBOUR) INTAKE
- ◉ NEW BOREHOLE INTAKE CONSTRUCTED
- 5. NGOMBENI INTAKE
- 6. MAKOMBENI INTAKE (not yet in use)
- ▲ RESERVOIR, EXISTING
- 7. UWELENI WATER RESERVOIR
- 150 EXISTING PIPELINE AND PIPESIZE (mm)
- D110 NEW OR REHABILITATED PIPELINE AND PIPESIZE (mm)



Projekt: ZANZIBAR URBAN WATER SUPPLY PROJECT, PHASE 1		Drawing title: MKOANI TOWN, 1991-1995	Scale: 1:50,000
DEPARTMENT OF WATER DEVELOPMENT, ZANZIBAR	FINNIDA		
Consultant: PLANCENTER LTD	Original date 1995 Approved by	Planning field, project no, drawing no: 1544-09058-	Revision: FIGURE 8