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TANZANIA

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FINLAND

Ministry of Water, Construction,
Energy, Lands and Environment,
Zanzibar

Ministry for Foreign Affairs

Department of Water Development

Finnish International Development
Agency FINNIDA

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ZANZIBAR URBAN WATER SUPPLY DEVELOPMENT PROJECT

I Implementation Phase

1991 - 1994

Project Document
June 1991

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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: 1991 - 1994

Starting date: January 1991

Project financing:

FINNIDA	FIM 50,000,000
RGoZ	FIM 2,520,000
	(TAS 126,000,000)
TOTAL	FIM 52,520,000

Competent authorities: Ministry of Finance, Tanzania

Ministry for Foreign Affairs, Finland/FINNIDA

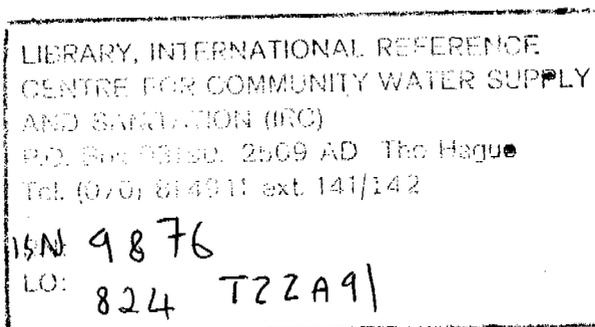
Ministry of Water, Construction, Energy, Lands and Environment of Zanzibar

Implementing agency: Plancenter Ltd, Finland

Executing agency: Department of Water Development, Zanzibar

Arrangements for Coordination of Project Implementation:

The Steering Committee will supervise the implementation of the project.



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ABBREVIATIONS AND ACRONYMS

DWD	Department of Water Development
EIA	Environmental Impact Assessment
FIM	Finnish Mark
FINNIDA	Finnish International Development Agency
GoF	Government of Finland
GoT	Government of Tanzania
HRD	Human Resources Development
MOF	Ministry of Finance
MWCELE	Ministry of Water, Construction, Energy, Lands and Environment
O&M	Operation and Maintenance
PIU	Project Implementation Unit
RGoZ	Revolutionary Government of Zanzibar
TAS	Tanzanian Shilling
UWS	Urban Water Supply
WSDP	Water Supply Development Plan

CURRENCY EQUIVALENTS (June 1991)

USD 1	=	FIM 3.95
FIM 1	=	TAS 0.019

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MANAGEMENT SUMMARY

1. Project Background

The Government of the United Republic of Tanzania has requested FINNIDA to consider financing the first implementation phase 1991 - 1994 of the Urban Water Supply Project of Zanzibar, which is a part of the overall Zanzibar Urban Water Supply Programme.

The planning phase of the project took place in 1989 - 1990 consisting of Financial Analysis, Institutional Study, Water Resources Study, Physical Planning and Environmental Impact Assessment. These different components are compiled in the Urban Water Supply Development Plan 1991-2015.

This project document gives a framework for the years 1991 - 1994. More detailed work plans and budgets will be prepared for each year separately.

2. Macroeconomic background of Zanzibar

The economy of Zanzibar is dominated by agriculture, principally the production of cloves. Due to many economic setbacks over the last years, the governmental and parastatal bodies have had difficulties generating sufficient revenue to meet expenditure needs. To improve the situation the Government commenced an economic recovery programme in 1987. The main targets of the programme are reducing subsidies on imported food and stimulating home production, controlling government spending, and developing the private sector, especially concerning non-agricultural sectors as well as liberalizing trade through the removal of state controls.

3. **Project justification**

The present water supply system is comprised of four urban schemes, one in the town of Zanzibar on Unguja island and one in each town of Pemba island (Wete, Chake Chake and Mkoani). The conditions of the schemes are poor and water quality is bacteriologically unsatisfactory due to pollution through unprotected intakes, broken pipes and unhygienic storage tanks. Distribution interruptions are common mainly due to power failures, and service coverage inadequate due to an insufficient quality of infrastructure and poor operation and maintenance.

The inadequate water supply together with poor waste water and solid waste disposal systems cause a severe health risk to the urban population.

The four towns accommodate one third (about 230,000 people in 1990) of the whole population of the Zanzibar islands. The urban population is estimated to be almost 340,000 by the year 2000 and nearly 600,000 by the year 2015. This population development would lead to very densely populated urban areas with large suburban fringe areas, which would mean enormous problems in terms of space and employment especially in the town of Zanzibar.

Successful urban water supply and sewerage development will establish economic self-reliance among the water organization and will also contribute significantly to the success of the national economic recovery programme, facilitating the development of tourism and industry. The project will make it possible to meet the future increased demands of water, as well as increasing skills and awareness among authorities, officials and the public. Water supply development will contribute to the environmental health situation of Zanzibar.

4. Institutional framework

The Ministry of Water, Construction, Energy, Lands and Environment of Zanzibar has, through the Department of Water Development (DWD), full responsibility for the provision of water supplies in Zanzibar. The DWD is the sole national authority for all water-related undertakings in the two islands.

The Competent Authorities of the two Governments for the implementation of the Project are the Ministry for Foreign Affairs of Finland, represented in Finland by the Finnish International Development Agency, FINNIDA, and in Tanzania by the Embassy of Finland in Dar es Salaam, and the Ministry of Finance of Tanzania. However, in matters pertaining to the substance of the project and not affecting the overall responsibilities of the Government of Tanzania, the Department of Water Development in the Ministry of Water, Construction, Energy, Lands and Environment of Zanzibar has the right to represent the Ministry of Finance.

The other organizations of Zanzibar involved in project implementation are the Municipal Council of Zanzibar and the Town Councils of Pemba, the Irrigation Department of the Ministry of Agriculture, the Commission for Lands and Environment, the Institute of Marine Science of the University of Dar es Salaam, the Ministry of Health, the Ministry of Education, the Ministry of Trade and Industry, and the State Fuel and Power Corporation.

5. Objectives

The general development objective of the project is that of providing its beneficiaries with safe water in a sustainable, cost-effective way with minimum environmental risks, and to provide water authorities institutional capability to effectively operate, manage and maintain the facilities.

The development objectives of each sub-project are the following:

Economic and institutional development

To contribute to the development of a clear-cut policy and strategy for urban water supply and achievement of economic efficiency, as well as to improve financial performance, institutional capacity, and the quality of human and material resources of the organization in charge of water supply. In addition, the involvement of consumers to water issues will be encouraged.

Water supply development

To establish adequate and safe urban water supply systems appropriate to prevailing economic and functional conditions.

Water resources and environmental development

To guarantee the adequate share of water resources for urban water supply and improve the environmental and health status of the Unguja and Pemba islands by improving the water quality and to minimize any possible environmental deterioration due to project activities.

6. **Project strategy**

The first implementation phase 1991-1994 of the project shall concentrate on financial, institutional, human resources, community participation and environmental development, as well as on the verification of groundwater development plans and the development of preventive and corrective maintenance systems. The main emphasis in the beginning shall be on developing a tariff policy for the water organization. The technical part of this phase of the project mainly consists of the most urgent repair works and the technical planning for the following phases.

The project is divided into three sub-projects: (1) economic and institutional development, (2) water supply development and (3) water resources and environmental development.

The target of economic and institutional development is that of gradually developing economically self-reliant water organization which shall be capable of effectively managing, operating and maintaining the water supply systems.

Providing urban water organization with the necessary management authority, financial independence and legal basis for operation is the responsibility of the political bodies and authorities of Zanzibar. The role of the project is to contribute by participating in preparatory committee work and drafting proposals and estimates with local experts and officials. The decision making responsibility lies with the Zanzibari authorities.

Human resources development is part of institutional development. It is a continuous process of assessing the shortcomings in manpower and organization.

To solve the problems regarding the inadequacy of the contacts between the beneficiaries and water authorities and the lack of knowledge about water issues, the beneficiaries need to be informed, educated and motivated through an extensive community education and participation programme.

The implementation of the water supply development activities shall be based on revised water policies and guidelines of the Government of Zanzibar as well as on the action plan outlined in the Urban Water Supply Development Plan 1991-2015. The construction and renovation programmes shall be devised in relation to the progress of the financial, institutional and human resources development components, subject to frequent reviews in connection with the annual work plans.

Water resources development, including drilling and monitoring activities and the establishment of a coordinating system for ground water utilization, shall be initiated already in the early stages of the first implementation phase.

Development of the water quality and environmental monitoring facilities and capabilities shall be emphasized from the beginning of the first implementation phase and maintained throughout the project periods.

The preliminary environmental impact assessment (EIA) for the project was done during the planning phase. The work shall be continued by carrying out further EIA study during the rainy season.

The capacities and facilities of the existing DWD water laboratory established during the planning phase shall be extended during the first implementation phase. Extensive water quality monitoring programmes are to be prepared and implemented. Special studies on ground water pollution shall also take place.

7. Inputs of the two Governments

Finnish input

The Finnish implementation agency will provide specialist advisors for the project. The Finnish labor input will be strongest during the first year of the first implementation phase of the project, and will be decreased over the following years.

The FINNIDA budget is FIM 50,000,000, and includes the costs of Finnish staff, materials and equipment needed to support the implementing agency, materials and equipment required by DWD for the project, and costs of construction contracts that will be awarded.

Tanzanian/Zanzibari input

It is essential for the success of the project that the Department of Water Development provide the necessary full-time specialists for the project. These experts would form, together with the staff of the Finnish implementing agency, the Project Implementation Unit, which will work within the DWD.

A fixed budget amount shall be allocated for the Project in Tanzanian shillings for the procurement of spare parts and materials for upkeeping the present service level. A spare parts and materials list is to be issued by the local water authority. These supplies will be used by the local organization. The local allocation is 10 % of the total budget, except for technical assistance costs.

The UWS office, workshop and store plot at Mabluu and Madema in Zanzibar Town and laboratory plot with ready made house in Saateni are to be provided by the Government of Zanzibar, as well as the premises needed in Pemba.

Constructing/finalizing and equipping the buildings will be done by the project after the new UWS organization is approved.

8. Risks and assumptions

Zanzibar is going through a period of political change and is also having to cope with repercussions arising from the Gulf Crisis. There is a risk that it will take some time yet before the improvements proposed by the project are sustained by a viable organization. Both government and individual water users lack finances. The timing of the reintroduction of charges for domestic beneficiaries after a gap of over 15 years may be critical.

Other factors which may delay the scheduled implementation of the project include delays in international procurement; delays in transportation of equipment due to difficulties in connections between Dar es Salaam, Zanzibar and Pemba; temporary power failures, especially in Pemba; inadequacy of staff for training; non-availability of adequately skilled local contractors; and delays in the progress of the sewerage and drainage project of the Stone Town.

1 BACKGROUND AND JUSTIFICATION

1.1 Project area and population

Zanzibar consists of two major islands, Unguja and Pemba, which were formed out of a large delta formation of the Ruvu River, emerging during the rift faulting of coastal East Africa. Unguja is separated from the Tanzanian mainland by a shallow ocean floor approximately 40 km wide, and Pemba by the 700 m deep Pemba Channel. The islands are located a few hundred kilometers south of the equator. Unguja and Pemba cover areas of 1660 km² and 984 km² respectively (figure 1). There are four towns on the islands, Zanzibar Town on Unguja and Chake Chake, Wete and Mkoani on Pemba.

The future population projections are in this document based on today's estimated population growth. The following tables present figures for the two islands and separately for the four towns which are the target areas of the project.

Population projections for Unguja and Pemba:

	1988	1990	2000	2015
Unguja	387428	413240	571800	936800
Pemba	265039	279000	360700	530100
Zanzibar Grand Total	652462	692240	935500	1466900

Population projections for the four towns:

	1988	1990	2000	2015
Zanzibar Town	176231	190000	275300	483000
Chake Chake	13972	14380	20900	36500
Wete	19196	20800	30000	54800
Mkoani	7327	7400	9900	15600

1.2. Economic setting in Zanzibar

1.2.1 Institutional system

Since 1964 Zanzibar has been an integral part of the United Republic of Tanzania, at the same time retaining considerable autonomy. Zanzibar has its own constitution, president and government, giving the country authority over the legislative and executive affairs as well as its economic policies.

The Revolutionary Government of Zanzibar has applied socialist principles to a centrally planned economy. There is almost total state ownership, including the ownership of land.

1.2.2 Social infrastructure

The Arab and Indian communities, who earlier dominated the political and business life of Zanzibar, left the country after the revolution. This, combined with the ambitious policies of free education, free housing and free health care at a time of economic decline led to a major breakdown of the infrastructure through a lack of funding and a lack of skills at all levels. Shortages of teachers, doctors and engineers were particularly acute. Schools are currently overcrowded, hospitals are ill-equipped and understaffed, and housing and water services are in a state of disrepair.

1.2.3 External assistance

The UN agencies, Finland and Denmark are major sources of external assistance and are at present funding programs in the health, agriculture, forestry, water, communication and education sectors.

1.2.4 Economic performance

Zanzibar's economy is dominated by agriculture, which accounts for between 50 % and 60 % of its G.N.P. This heavy dependence on agriculture becomes even more significant in light of the fact that the economy relies on its clove crop as the main source for foreign exchange. Apart from cloves the remaining agricultural activity consists of subsistence farming.

Overproduction of cloves in Indonesia has resulted in major drops in clove prices on the world market striking a serious blow to the economy of Zanzibar. Inflation has soared and services have deteriorated even more rapidly. Consumer prices have risen at more than 20 % per annum since 1982 with prices doubling between 1987 and 1989.

The price of imports significantly affects domestic prices. The combined effect of rising import prices and a major depreciation of the Tanzanian Shilling (from a mid-1987 equivalent of TAS 65 to one USD, to an equivalent of TAS 190 to one USD at the end of 1990) are the cause of rapid increases in domestic prices.

All these factors have had a major impact on the finances of the government and of administrative bodies, resulting in an inability to generate sufficient revenue to cover expenditures. This in turn has led to the lowering of wages in real terms, a severe cut-back in maintenance and in the growth of the public sector debt on a massive scale.

Recognizing the seriousness of the situation the government is continuing to pursue a comprehensive economic recovery programme first undertaken in 1987. The main targets of this programme are:

- 1) to reduce subsidies on imported food and stimulate home production
- 2) to control government spending
- 3) to develop the private sector, especially regarding non agricultural area
- 4) to liberalize trade through the removal of state controls.

1.3 Present situation in the sector

1.3.1 Urban water supply

The present water supply system is comprised of four urban schemes: Zanzibar Town, Wete, Chake Chake and Mkoani.

The existing urban water supply organization and manpower is presented in figures 3/1, 3/2, 4/1 and 4/2.

Zanzibar Town

The scheme covers approximately 24 km², 145 km of pipeline ranging in diameter from 50 mm to 600 mm. The population served is 157,640 people (1988).

Water sources

Urban Zanzibar gets its water supply from eight water sources (5 boreholes, 2 springs and 1 cave) with an average production of between 15,000 - 18,000 m³/day. None of the water sources are properly protected and there is a high risk of pollution and contamination. Also, water is neither treated nor disinfected.

Water pipelines

The total length of high pressure network pipeline is 132.5 km with diameters ranging from 50 mm to 450 mm. The low pressure mains located in limited areas of town (Bububu, Mtoni and Harbour) cover a 12.5 km length of pipeline ranging from 150 mm to 600 mm (C.I.).

Some portions of pipe network are in poor condition (old systems, lack of spare fittings, etc.) and need proper maintenance and replacement.

Storage facilities

The storage facilities include overhead pressed steel tanks, underground concrete tanks and on-ground steel tanks. Five tanks (3 underground, 2 overheads) located at the Saateni water works serve the town area pipe network and east distribution pipe network. Two tanks (1 underground, 1 on-ground) located at the Welezo high-level zone serve the suburban area pipe network. The total storage capacity of the above tanks is 7820 m³.

Most of the tanks are in bad condition (corroded and leaking), and need repair or replacement.

Saateni booster station

The station receives water from two spring sources (Bububu and Mtoni) amounting to 5,000 - 13,000 m³/day. It is made up of the following structures:

- a) inlet house with weirs and chlorination basin, where water from Bububu and Mtoni springs is collected
- b) three underground concrete reservoirs, two of them being 1000 m³ and one 2250 m³
- c) booster station equipped with the following pumps:

1 electric driven pump	504 m ³ /h x 52 m
2 electric driven pumps	225 m ³ /h x 63 m
1 diesel driven pump	450 m ³ /h x 30 m

- d) two overhead reservoirs of a volume of 450 m³ each.
- e) two small workshop office buildings on locale.

Due to old age and poor conditions, the Saateni water works structure needs repair or replacement for utilization in the future.

Wete

The scheme covers approximately 10 km², 20 km of pipeline (diameter 50 mm - 200 mm). The population served is 30,000 people (1988).

Water sources

The town of Wete is served by three water sources (2 springs and 1 borehole). The average production of these sources is 2100 m³/day - 2760 m³/day. None of the sources are properly protected. The pumping systems and structural facilities are poor and need replacement or proper maintenance. No water sources have disinfection facilities.

Pipelines

The high pressure pipe network is old and some portions are in poor condition (due to a lack of spare fittings). It must be properly repaired or replaced in order to reduce leakage.

Storage facilities

The water tanks, which include one on-ground and two overheads located at Mtemani, serve the town area pipe network distribution mains. The total storage capacity of these tanks is 520 m³. The tanks are in poor condition (leaking and corroded) and need renovation.

Mtemani booster station

Mtemani booster station is made up of steel elevated tanks and a booster station for pumping water into them. The existing booster pumps are very old and in poor condition. They should either be renovated or preferably replaced by a direct high-pressure zone pumping out of one of the existing or future water sources.

Water sources

The town of Mkoani is served by two water sources (boreholes). The average pumping of the sources is 320 to 400 m³/day. The water sources are not properly protected. The condition of the sources is poor (silt-ing problem) and its pumping facilities are worn-out and need replacement.

Pipelines and storage facilities

The pipelines are in poor condition (leakage due to a lack of spare parts). Only one overhead tank is lo-cated at Uweleni with a capacity of 180 m³. The tank is in fairly good condition and does not require major renovation. Additional storage facilities would be needed at the same location in the future.

1.3.2 Urban sanitation

The waste water and solid waste disposal system of the towns of Unguja and Pemba is at the moment poor, but some improvement for the waste water disposal is to be seen with the Sewerage and Drainage Project. The pro-ject is planned to be started soon, but will con-centrate only on the area of the Zanzibar Stone Town.

At the moment, there are centralized sewerage systems only for some areas, such as the Stone Town and the Kikvajuni Housing Scheme in Zanzibar. Even in these places the sewers are often blocked due to poor main-tenance, misuse and sand brought in by tides. There-fore, although the waste waters are in principal dis-charged into the sea through various outlets to dif-ferent parts of the coast, the waste often does not reach the sea, but seeps into the ground thereby pol-luting the ground water. In the areas where the waste waters have reached the sea, the coastal water has been found polluted and unsuitable for swimming in.

In the Zanzibar Stone Town 80 % of the population have flush toilets with septic tanks and the rest have pit latrines. There is, however, no easy access for trucks in the cleaning of the septic tanks, resulting in over-flow and contamination. In the suburban areas scat-tered around Zanzibar Town and in the towns of Pemba pit latrines are mainly used. In those areas open air defecation is also common.

1.3.3 Water resources

Groundwater is the only feasible alternative for meet-ing the water demands of the municipalities of Unguja and Pemba. The ground water resources are also needed for rural water supplies and for irrigation purposes.

Based on the estimated daily water demand, the need for ground water in urban areas will be as follows:

low domestic

Unguja:

Zanzibar Town

by 1990 - 13000 m³/day

by 2000 - 27300 m³/day

by 2015 - 59500 m³/day

Pemba:

	Wete	Chake Chake	Mkoani	Pemba Total m ³ /day
by 1990	1200	800	400	2400
by 2000	2600	1800	800	5100
by 2015	6800	4100	1700	12600

The possibilities for drawing these quantities from ground water sources are discussed in the following chapters.

Zanzibar:

The Bumbwi Corridor runs across Unguja Island from north to south, passing a few kilometers east of Zanzibar. It offers a feasible ground water development area for drawing water for the town, up to an approximate quantity of 70,000 m³/day.

Altogether 8,000 - 10,000 m³/day could eventually be obtained from Bububu Spring and Mtoni Spring, which are located just near the Zanzibar town center and therefore would be very economical sources. Mtoni Spring, however, has some problems with water quality which must first be solved.

Another potential source could be the Kisima Mchanga sub-corridor (20,000 m³/day), which lies at a distance of about 15 - 25 km from Zanzibar. However, this distance may be a rather uneconomical pumping distance. Another potential source is the Koani-Kiongoni area, at a distance of 6 - 8 km, which could yield up to 10,000 - 20,000 m³/day.

The feasibility of different alternatives is to be studied during 1991 - 1994, through test drilling and test pumping programs. The location of the proposed groundwater development areas is presented in figure 2.

The planned intake areas are to be gazetted as areas restricted for groundwater development for Zanzibar town. Possible excess water resources may be allocated for rural and irrigation use, to be decided upon by the proposed water board.

The water quality in the corridor areas is very good for domestic purposes. There is a theoretical chance for sea water intrusion from the southern end of the Bumbwi Corridor as the potentiometric gradient decreases to only +2 m above the mean annual seawater level. However, the recently obtained test pumping results show that large quantities of groundwater can be pumped from this area without overly changing the water table conditions.

Town of Chake Chake:

Kwapweza Spring would offer a supply source of up to 50 % of today's water demand for the Chake Chake area. Three to four test/production boreholes should be drilled in the Kwapweza and Msingeni areas to determine the available additional ground water potential. Based on very tentative estimates a total of about 1,000 m³/day of groundwater could eventually be obtained from the Kwapweza valley.

According to geoelectrical sounding results, high yielding boreholes - over 50-100 m³/hour - can be drilled in the Kiziwamaji area, about 4 km northeast of Kwapweza.

The valley in which the Jamvini C7 borehole is located is a continuation of the Kwapweza valley and offers the first alternative well-field location, with possible yields of 3000 - 6000 m³/day.

The Changaraweni borehole valley could yield about 4000 m³/day. This area requires careful monitoring and detailed study as there is a chance for sea water intrusion. The water contains iron and must be treated. Changaraweni should not be considered a priority area in future well-field plans.

1.4 Project history

The Rural Water Supply Plan was prepared by a German consultant, during 1987 - 1990, based on African Development Bank finance and under the coordination of the Department of Water Development.

FINNIDA and the United Republic of Tanzania signed an agreement in October 1989 on the preparation of an Urban Water Supply Development Plan, covering the towns of Zanzibar, Chake Chake, Mkoani and Wete.

Project operations commenced in November 1989 as planned. The expected time for completion of a draft Urban Water Supply Development Plan is by the end of 1990. During the planning phase the following studies have taken place:

- Water Resources Study
- Institutional Study
- Household Survey
- Physical Planning of Water Supplies
- Financial and Economic Analysis
- Preliminary Environmental Impact Assessment

The Government of the United Republic of Tanzania has further requested FINNIDA to consider financing the first implementation phase, 1991 - 1994.

The KfW, a German development funding agency, has agreed on financing preparation of the Urban Drainage and Sewerage Development Plan for Zanzibar, due to commence in 1991.

The Government of Zanzibar has nominated a committee for the preparation of a General Water Policy. The Urban Water Supply Development Plan Project is represented in the committee.

1.5 Justification of the project

The four towns accommodate one third (about 230,000 in 1990) of the whole population of the Zanzibar Islands (Unguja and Pemba). Zanzibar has a population of 176,000 and is the main commercial, industrial and tourism center of the islands. With today's growth rate the urban population is estimated to be almost 340,000 by the year 2000 and nearly 600,000 by the year 2015. This population development would lead to very densely populated urban areas with a large suburban fringe area, which would mean enormous problems in terms of space and employment, especially in Zanzibar proper.

Trade in spices, especially cloves, is traditionally the main source of foreign income for the islands. The

price of cloves has gone down, and the foreign exchange reserve of Zanzibar has decreased drastically. The economy of the islands is undergoing a recovery programme phase, seeking ways and means of saving and generating adequate foreign currency funds for the procurement of necessities such as spare parts, machines and food products and for achieving self sufficiency, especially in agricultural production.

The present urban water supply schemes are supposed to serve about 200000 inhabitants at the moment. However, the conditions of the present water supply systems are poor and water quality is bacteriologically unsatisfactory due to pollution through unprotected intakes, broken pipes and unhygienic storage tanks. Distribution interruptions are common mainly due to shortages of electricity, and service coverage inadequate due to an insufficient quality of infrastructure and poor operation and maintenance. Ultimate reasons for all this can be found in an insufficient institutional set-up, poor financial performance and a lack of motivation and skills, as well as a lack of water policies and legislation.

The inadequate water supply together with the poor waste water and solid waste disposal systems cause a severe health risk to the urban population, which is also partly due to a poor level of knowledge about water, sanitation and health issues among the beneficiaries.

Successful urban water supply and sewerage development will establish economic self-reliance among the water authorities and will also essentially contribute to the success of the national economic recovery programme, facilitating the development of tourism and industry. It will make it possible to meet the future increased demands of water as well as increasing skills and awareness among authorities, officials and the public. Water supply development will contribute to the environmental health situation Zanzibar.

2 TARGET GROUPS, ENVIRONMENTAL SETTINGS AND INSTITUTIONAL FRAMEWORK

2.1 Target groups

The primary target groups of the Urban Water Supply Project are the inhabitants of the four towns in Zanzibar and the industries and other commercial users served by the supplies. These are the groups which will benefit from the improved water supply. Direct project assistance, however, is given to the water authorities in order to develop their capabilities of improving the water supply situation.

2.2 Environmental settings

The environment of the islands of Zanzibar is still quite unspoiled but also very sensitive, and so there are some risks to be taken into account in future development activities.

From the environmental and health point of view the impacts of the water supply project are more beneficial than adverse, and the project will assist in solving some of the problems already identified in Zanzibar. However, some negative impacts can also be foreseen if proper care is not taken concerning the environmental aspects.

Environmental issues related to ground water quantity

As mentioned before, ground water reserves are the only water resource for urban and rural water supplies for both Unguja and Pemba. These include boreholes, springs and caves. Ground water is also needed for rural water supplies. Shallow wells are very important even in urban areas for replacing the piped water supply when there is no electricity (in Pemba about half of the time) or when there are some other problems in the functioning of the town supplies. Agriculture is a big user of ground water for irrigation purposes.

At the moment the ground water reserves seem to be good. The remarkable increase in the use of ground water for future town water supplies, together with other uses such as irrigation and a probable increase in the use of water due to the development of tourism, may cause some problems in the future. The possible consequent drop in the level of ground water will first affect the shallow wells, which obviously will dry up.

The possible salinization of ground water will be another major problem regarding effective ground water use.

Environmental issues related to ground water quality and health

Most of the health problems in Zanzibar result from or are caused by poor living conditions. They are mainly related to factors such as socio-economic status, climate, cultural practices, poverty, rapid growth of population and inadequate and unsanitary living conditions, including the inadequate quality of drinking water and the poor personal hygiene habits.

Almost all the water intakes of urban water supplies in Unguja and Pemba were found to be bacteriologically polluted, and therefore also the whole network. Even fecal pollution seems to take place. The sources are usually not covered or otherwise protected and therefore any kind of pollution is possible. The pollution may also take place within the network due to leakages of pipelines and unhygienic storage tanks. The shallow wells also appeared polluted. The microbiological pollution of drinking water can be considered the most acute water related health problem for the public at the moment.

Historically the ground water sources and water supply of Zanzibar have had a very good reputation for cleanliness and good taste. According to the first results of the household survey done during the planning phase of the project, the quality of the water of the Zanzibar Town supply is also considered good.

In Zanzibar the soil is generally very permeable (due to sand and coral) and therefore any waste materials or chemicals discharged into the ground without treatment can easily pollute the groundwater and thus create a health hazard.

In the future the increased amount of domestic waste water due to expanded water supply systems may add to the problem of poor waste water disposal and groundwater pollution. This can be avoided by proper planning and coordination of the activities of the project with the forthcoming sanitation project in Stone Town of Zanzibar. The problem of sanitation outside the Stone Town is still unsolved. It was not included in this project.

The physical and chemical quality of the ground water is generally good. The intrusion of sea water into the ground water could be a problem, but no alarming results have been found so far. One possible risk to the quality of ground water is the pesticides and fertilizers used in agriculture, especially in rice cultivation, where evidently a lot of herbicides are used to control weeds. In forestry activities chemicals are used only in nurseries, which limits the problem to a few small areas. Evidently the level of chemical use in industry in Zanzibar is not high. However, there are

some potential pollution risks - especially because there are no controls on the discharge of waste waters and waste matters.

Other environmental issues related to the project

The construction activities of the project may have some indirect environmental impacts, such as landscape degradation and beach erosion due to the use of gravel and sand. Possible hazards to ground water due to construction activities should also be taken into account. Setting up open water storage places on construction sites should also be avoided, as the sites can be breeding places for mosquitos. The project may add to the problem of unplanned expansion by creating new job opportunities. It may also promote tourism, which again has its adverse effects on environment. These and other possible risks, which may seem small at this stage, should be considered throughout the implementation of the project. The awareness of possible environmental risks must be increased among the authorities and project personnel.

2.3 Institutional framework

The Ministry of Water, Construction, Energy, Lands and Environment (MWCELE) has full responsibility, through the Department of Water Development (DWD), for the provision of water supplies (see the organization, figures 3/1, 3/2, 4/1 and 4/2). DWD is the sole national authority for all water-related undertakings on the two islands, including the issuing of permits to drill boreholes for agricultural purposes.

In 1986 responsibility for the urban drainage and sewer functions was given to the local government, being now under the supervision of the Municipal Council of Zanzibar Town and the Town Councils in Pemba.

The Ministry of Health has on occasion undertaken the responsibility of water quality monitoring, though not on a regular basis.

The Ministries of Finance and Planning approve and allocate the budget, and the Price Commission approves taxes and rates. Since 1982 only commercial and industrial consumers such as hotels, factories and ships have been charged for water.

Other Ministries, Departments and Institutions of Zanzibar which will be involved with or affected by the project are as follows:

- Cooperation with the Irrigation Department of the Ministry of Agriculture in the planning of ground water resources will be undertaken.

- The Commission for Lands and Environment, in particular its Department of Environment, plays an important role in intersectoral cooperation on environmental issues, which the project will also promote.
- The Institute of Marine Science (in Zanzibar) of the University of Dar es Salaam is involved in water quality control studies and other environmental research. Plans for cooperation with the project already exist.
- Hygiene and health education activities of the project will be implemented in conjunction with the Ministry of Health.
- The Ministry of Education will be involved in planning the training programs of the project, which will also affect the existing teacher's training and school programs of the Ministry.
- The Ministry of Trade and Industry will assist the project in providing development forecasts for industry and trade.
- Functioning cooperation should exist with the State Fuel and Power Corporation to guarantee the availability of their services.

3 OBJECTIVES AND INDICATORS

The project has one general development objective, as determined in 1989 and stated in the project document of the planning phase. In addition, each of the three sub-projects have their own long term development objectives. All these objectives are to be gradually achieved by the end of the planned deadline for the Development Plan.

Each sub-project has various immediate objectives, which are to be achieved during the first implementation phase 1991-1994. These immediate objectives with achievement indicators are presented in table 1.

The achievement of objectives will be followed up by using indicators (table 1). This monitoring will be done in the process of progress reporting, and will be complied with ideas for revising the project plans when the indicators are not met.

The general development objective of the project is:

To provide beneficiaries with:

- safe water in a sustainable, cost-effective way with a minimum of environmental risks

and to provide water authorities with:

- institutional capability to effectively operate, manage and maintain the facilities

The development objectives of each sub-project are the following:

Sub-Project 1: Economic and institutional development

Development objective:

To contribute to the development of a clear-cut policy and strategy for urban water supply and achievement of economic efficiency, as well as to improve financial performance, institutional capacity, and the quality of human and material resources of the organization in charge of water supply. In addition, the involvement of consumers to water issues will be encouraged.

Development indicators:

- Existence of a new policy and strategy for a self-supporting urban water supply organization.
- Existence of a self-reliant urban water organization.
- Water systems function without problems related to an inadequate organizational set up.

Sub-project 2: Water supply development**Development objective:**

To establish adequate and safe urban water supply systems appropriate to the prevailing economic and functional conditions.

Development indicators:

- Inhabitants of the four towns are supplied with a safe and adequate water systems.

Sub-project 3: Water resources and environmental development**Development objective:**

To guarantee the adequate share of water resources for urban water supply and improve the environmental and health status of the Unguja and Pemba islands by improving the water quality and to minimize any possible environmental deterioration due to project activities.

Development indicators:

- Plans exist for meeting the future water supply needs.
- Ground water quality meets the standards set for safe and good drinking water.
- No apparent environmental deterioration due to project activities can be seen.

4 COMPONENTS, OUTPUTS, OUTPUT SPECIFICATIONS

The project has three sub-projects, which are further divided into components. The sub-projects, components, outputs and output specifications are presented in table 1.

The division to sub-projects should not be considered too important and rigid, but the work should be done as team work, where all the experts of different fields - local and expatriate - plan and implement the activities together.

TABLE 1. Components, Objectives, Indicators, Outputs and Output Specifications

SUB-PROJECT 1. ECONOMIC AND INSTITUTIONAL DEVELOPMENT

DEVELOPMENT OBJECTIVE		DEVELOPMENT INDICATORS		
<p>To contribute to the development of a clear-cut policy and strategy for urban water supply and achievement of economic efficiency as well as to improve financial performance, institutional capacity and the quality of human and material resources within the organization in charge of water supply. In addition, increased involvement of consumers to water issues will be encouraged.</p>		<p>Strategy for self-supporting urban water supply organization is included in the general water policy.</p>	<p>Existence of self-reliant urban water supply organization.</p>	<p>Water systems function without problems related to an inadequate organizational set up.</p>
COMPONENT	IMMEDIATE OBJECTIVES	ACHIEVEMENT INDICATORS	OUTPUTS	OUTPUT SPECIFICATIONS
1.1 Financial and economic development	- To develop a basic structure for self supporting urban water supply organization	<ul style="list-style-type: none"> - Comments on overall policy given - Existence of a detailed programme for a gradual change to a self supporting water organization 	- Guidelines and policy paper for UWS	<ul style="list-style-type: none"> - Water works rules prepared - Financial policies defined
	- Introduction of water charges	<ul style="list-style-type: none"> - Local and foreign account opened - Domestic revenue collection started - Training material exists - The output specifications are fulfilled 	- Revenue billing system	- Rules for revenue collection established

COMPONENT	IMMEDIATE OBJECTIVES	ACHIEVEMENT INDICATORS	OUTPUTS	OUTPUT SPECIFICATIONS
1.2 Institutional arrangements and management development	<ul style="list-style-type: none"> - To develop an organizational structure suitable for operating and maintaining the urban water supply systems - To increase the capability of the urban water supply organization for developing its management and operational activities and taking corrective actions - To create functioning relations and coordination with sewerage & drainage, health and other authorities 	<ul style="list-style-type: none"> - Organization chart prepared and duties of department specified - Recommendations for optimum staffing pattern and required qualifications prepared - Basic indicators for monitoring and control prepared and put into use - Dynamic system of job descriptions and performance evaluation introduced and connected with personnel policy - Output specifications fulfilled 	<ul style="list-style-type: none"> - Specification of the scope of authority of the urban water supply organization taking into account functioning relations with related sectors - New organizational structure suitable for operating and maintaining the urban water supply system - Increased capability of the organization for developing its management and operational activities and taking corrective actions 	<ul style="list-style-type: none"> - The goals and tasks of the urban water supply organization specified in water policy and legislation - The scope of the authority of UWS and the rights and responsibilities of consumers defined in water works rules - Measures taken to transform the present organization into a self reliant one - Recommendations for an adequate manpower information system given - Personnel policy prepared - An annual financial and operational planning and monitoring system and the integration of this in the the decision-making introduced - Job descriptions and standards for work performance prepared for each employee - Training programme concerning the use of managerial tools and a management information system prepared

COMPONENT	IMMEDIATE OBJECTIVES	ACHIEVEMENT INDICATORS	OUTPUTS	OUTPUT SPECIFICATIONS
1.3 Human resources development	<ul style="list-style-type: none"> - To create adequate 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 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 authority and improve human resources 	<ul style="list-style-type: none"> - Detailed staffing plan prepared - Guidelines for the development of a qualitative and quantitative staffing structure prepared - Plans including budget proposals produced - Training practices introduced and people responsible for training determined - Basic on the job training material prepared - Training of the trainers executed - Detailed plans for participation in basic professional and vocational training in Zanzibar, the mainland and abroad prepared - Comprehensive training programme for the fields of management, design, operation, maintenance and construction prepared - Development plan prepared jointly with the Ministry of Education 	<ul style="list-style-type: none"> - Managerial and operational staff resources appropriate to the tasks of urban water supply organization - Improved level of skills in the urban water supply organization for producing and implementing human resources development plans and training programme development - Improved level of professional and vocational skills in the urban water supply organization and improved human capacity 	<ul style="list-style-type: none"> - Staffing structure and qualification requirements specified - Recommendations given for additionally required managerial and operational manpower - Plans developed for a continuous system for assessing manpower and training needs for providing annual and long-term staff plans - Patterns for on-the-job training developed - Training programme of internal trainers prepared - Training needs assessed and prioritized, expertise needs estimated - A comprehensive training programme for every trade group covering the entire field of activities of the urban water organization prepared in conjunction with relevant training institutions - Recommendations made for developing relevant vocational training in Zanzibar

COMPONENT	IMMEDIATE OBJECTIVES	ACHIEVEMENT INDICATORS	OUTPUTS	OUTPUT SPECIFICATIONS
1.4 Community education and participation	<ul style="list-style-type: none"> - To increase the responsibility of urban inhabitants regarding water issues - To increase the awareness of water, health and environmental aspects among urban inhabitants - To strengthen the cooperation between different authorities on water issues as well as to encourage the involvement of local governments in increasing awareness of water related issues among urban inhabitants 	<ul style="list-style-type: none"> - Communication strategy exists - Citizen's water supply guide exists - Consumer service activities specified and assigned within the UWS - Curriculum prepared of water subjects to be integrated into the teachers' training syllabus - Teaching material for teachers and for the campaign prepared - Pilot "Water Day" conducted, programme and material revised based on the pilot campaign - Information spots on radio, and advertisements and articles in newspapers commenced; proposal drawn up for TV programmes concerning water issues - Joint programme for cooperation between different authorities exists 	<ul style="list-style-type: none"> - Increased responsibility of urban inhabitants concerning water issues - Consolidation of environmental education related to water in primary schools - Plan for disseminating water information via mass media supporting activities carried out by urban water supply organization and local governments - Strengthened cooperation with other authorities related to water issues as well as involvement of local governments in efforts to increase awareness of water-related matters among urban inhabitants 	<ul style="list-style-type: none"> - Relationships between beneficiaries and water authorities are defined by water works rules - Orientation programme for teachers trainers prepared - Plan for campaigns for schools prepared and scheduled - Joint programme with the Ministry of Health on water and health for health workers especially for those working with mothers - Plan for seminar series prepared jointly with local governments concerning opportunities for them to contribute to the improvement of urban water supply

SUB-PROJECT 2. WATER SUPPLY DEVELOPMENT

DEVELOPMENT OBJECTIVE		DEVELOPMENT INDICATORS			
To establish adequate and safe urban water supply systems appropriate to prevailing economic and functional conditions.		Inhabitants of the four towns are supplied with safe and adequate water systems.			
COMPONENT	IMMEDIATE OBJECTIVE	ACHIEVEMENT INDICATORS	OUTPUTS	OUTPUT SPECIFICATIONS	
2.1 Improvement of UWS schemes	- To increase volume of water supply by maximizing the use of existing installations	- Better correlation between pumpages and collected revenue	- Improved service in the multi-storey housing areas	- Increased water volume	
	- To improve the pressure level in existing distribution network	- Improvements in meeting the water demand	- Decreased water losses	- Improved pressure levels	
	- To safeguard the drinking water quality from health hazards	- Continuous disinfection of the supplied water	- Improved water quality in the network	- Decreased water losses	- No seepage back to network
	- To complete the immediate repair works within the distribution network	- Continuous supply of equipment and tools	- Improved yield from existing intakes	- Imported equipment, spares and tools are available	
	- To complete basic facilities for supporting activities needed for O & M of water supply system	- Reduced losses and periods of non-operation during power failures, etc.	- Engineering designs and manuals	- Detailed designs for new works and rehabilitations are available	
	- To improve the planning of future activities	- Availability of engineering designs, specifications and manuals	- Implementation programmes	- Cost estimates for civil, mechanical and electrical works, material equipment and chemicals are available	
		- Availability of annual implementation programmes for 1991-1994	- Revised master plan	- Detailed designs for supporting constructions are available	
		- Availability of implementation programme for 1995-2000 and 2000-2015			

COMPONENT	IMMEDIATE OBJECTIVE	ACHIEVEMENT INDICATORS	OUTPUTS	OUTPUT SPECIFICATIONS
2.2 Operation, maintenance and monitoring of the schemes	- To guarantee sustained supply of water	- Appropriate manuals available for each implemented water supply scheme - Continuous supply of spare parts	- O & M programme and development plans - O & M manuals - Improved service level of the schemes	- O & M manuals are available - Imported spare parts and tools are available - Minimized operational failures in the network
	- To monitor the input and output of water quantities in the distribution network	- Availability of daily pumping records - Availability of operation failure records	- Data base for monitoring the schemes	- Data collected and recorded of daily supplies, operation failures and leakages
	- To monitor the condition of the network	- The report of leakage prepared with technical and economic recommendations for renovation	- Leakage study results	- Leakage records available
	- To monitor the drinking water quality in the network	- Availability of water quality records	- Water quality monitoring system (see component 3.3)	- Water quality records available

SUB-PROJECT 3. WATER RESOURCES AND ENVIRONMENTAL DEVELOPMENT

DEVELOPMENT OBJECTIVE		DEVELOPMENT INDICATORS		
<p>To guarantee the adequate share of water resources for urban water supply and to improve the environmental and health status of the Unguja and Pemba islands by improving water quality and to avoid/minimize any possible environmental deterioration due to the project activities.</p>		<p>Plans exist for meeting the future water supply needs</p> <p>Ground water quality meets the standards for safe and good drinking water.</p> <p>No apparent environmental deterioration due to the project activities can be seen.</p>		
COMPONENT	IMMEDIATE OBJECTIVE	ACHIEVEMENT INDICATORS	OUTPUTS	OUTPUT SPECIFICATIONS
3.1 Water resources development	<ul style="list-style-type: none"> - To coordinate the use of water resources - To monitor ground water levels and water quality as well as meteorological information, to establish a reliable system for gathering long term monitoring information - To guarantee the availability of water for urban water supplies 	<ul style="list-style-type: none"> - Coordinating system for ground water utilization established - Ground water resources inventory finalized - Pumping and management procedures determined - Economic aspects summarized concerning the ground water programme - Detailed drilling programmes exists up to the year 2015 	<ul style="list-style-type: none"> - Coordinated use of water resources - Data base for ground water monitoring - Revised ground water utilization plans - Drilling programmes for 1991-1994, 1995-2000 and 2000-2015 	<ul style="list-style-type: none"> - Water board established - Ground water legislation and rules approved - Meteorological and hydro-geological data gathered and processed - Test drilling and pumping results available - Ground water monitoring network created - Existing resources development plans verified - Well-field layouts completed and long term drilling programme prepared - Well production pace coordinated with plans

COMPONENT	IMMEDIATE OBJECTIVES	ACHIEVEMENT INDICATORS	OUTPUTS	OUTPUT SPECIFICATIONS
3.2 Protection of water sources	<ul style="list-style-type: none"> - To improve and protect the environment of the existing water intakes - To see that the future water sources and supplies meet the environmental and health requirements 	<ul style="list-style-type: none"> - Protection plans exist for each existing and planned intake 	<ul style="list-style-type: none"> - Protected water intakes 	<ul style="list-style-type: none"> - Protection plans for intakes prepared
3.3 Environmental monitoring	<ul style="list-style-type: none"> - To strengthen water and waste water monitoring capacities and develop an extensive programme for monitoring the quality of ground water, as well as sewage and sea water - To establish a pragmatic environmental monitoring programme to avoid any adverse environmental impacts due to ground water exploitation, increased waste generation, construction activities and project side-effects 	<ul style="list-style-type: none"> - Water quality monitoring programme exists - Pragmatic environmental monitoring plan - Study reports 	<ul style="list-style-type: none"> - Functioning water and waste water monitoring system - Functioning environmental monitoring system 	<ul style="list-style-type: none"> - Functioning water and waste water laboratory with trained staff - Environmental monitoring plan prepared
3.4 Environmental awareness	<ul style="list-style-type: none"> - To improve environmental awareness 	<ul style="list-style-type: none"> - All training programmes mentioned in 1.3, 1.4, 2.1 and 2.2 include environmental issues - Orientation programme for authorities in environmental issues 	<ul style="list-style-type: none"> - Increased environmental awareness within water authorities, technical personnel and community 	<ul style="list-style-type: none"> - Environmental issues included in all training
3.5 Coordination of environmental activities	<ul style="list-style-type: none"> - To strengthen coordination of activities of environmental concern in cooperation environmental, health, education, agriculture, forestry and tourism authorities 	<ul style="list-style-type: none"> - Action plan for joint activities with environmental, health, agricultural, forestry and other sectors 	<ul style="list-style-type: none"> - Strengthened cooperation on environmental issues between different sector organizations 	<ul style="list-style-type: none"> - Action plan for joint activities prepared

5 PROJECT STRATEGY

5.1 Overall project strategy

The long-term programme for the development of the urban water supply in Zanzibar consists of the planning phase, which took place in 1989-1990, and three implementation phases, 1991-1994, 1995-1998 and 1999-2002. The fourth phase, 2003-2006 will be the final phase with FINNIDA support. By the end of the year 2006 a self supporting urban water supply organization should exist and function.

During the planning phase a Master Plan for Urban Water Development has been prepared.

The first implementation phase 1991-1994 will concentrate on financial, institutional, human resources, community participation and environmental development, as well as on the verification of groundwater development plans and the development of preventive and corrective maintenance systems. The main emphasis in the beginning must be on developing a tariff policy for the water organization. Depending on the progress of the economic and institutional changes, major renovation works of water schemes can be considered. Detailed planning for physical development will also take place during this phase.

The second implementation phase will place greater emphasis on physical development and the monitoring of financial, institutional, human resources, community participation and environmental development. It is hoped that the water organization will be a self reliant unit by the end of the third phase (the year 2002).

The third implementation phase is the preparation for ceasing from FINNIDA support. The fourth phase (phasing out) will concentrate on institutional coordination. Some import support will still be given during this phase.

Technical assistance must be gradually decreased. There may be one long term and a few short term advisers in the third phase. Technical assistance must concentrate on advising and training with particular attention given to managers, trainers, foremen and instructors. In connection with training, local institutions will be used and their capacities strengthened.

The institutional development and training as well as the ground water development programs will cover the entire project area equally.

The participation of women in all training activities of the project must be emphasized. This does not mean only education at the community level, but also the improvement of professional capabilities and the employment situation of women.

5.2 Approach to the implementation of the work

The project team will work within the existing organization in charge of water supply in Zanzibar implementing the policies and guidelines of the RGoZ. The role of the consultant is to advise in policy, organizational and technical development as well as in socio-economic and environmental aspects.

The project will be implemented by working in close cooperation with all the sector agencies involved in water supply development. Those organizations are listed in the section 2.3 of this report. In addition, coordination links will be created with other donor agencies and NGO's working in Zanzibar in related sectors and fields.

It is emphasized that the technical plans for the urban water supply development should be considered as objectives, which may be reached only if the institutional and economic development proceed according to the predictions of the Master Water Plan. Should the institutional and economic development at any stage fail to meet its obligations set in the Urban Water Supply Development Plan (1990), the progress of the technical programme will be delayed until a satisfactory position prevails.

5.3 Economic and institutional development

Financial and economic development

The target of the policy and economic development is that of gradually developing an economically self-reliant water organization capable of effectively managing, operating and maintaining the water supply systems.

For a self-supporting water organization the financing would come from various income-generating systems. The local revenue would be generated from water and service charges. Money could also be raised through a development tax and through selling services such as planning

and drilling to other government programs and the private sector, in case the private sector is not providing enough of these services. Foreign currency income would be generated by selling water for foreign currency, for instance to foreign ships which fill their water reservoirs at the Zanzibar harbor. Expatriates, tourist hotels and some industries could pay their water bill in foreign currency.

A consumer affordability analysis and analyses of tourism and industry have been done during the planning phase. During the first implementation phase in 1991-1994, the revenue billing options will be studied and a tariff system developed and put into practice.

To reach the goals of financial and economic development, new water policy and legislation has to be prepared and approved by RGoZ, and the urban water tariff system for all beneficiaries prepared, approved and implemented.

Institutional arrangements and management development

Two institutional prerequisites should be fulfilled in order to achieve progress towards the set goals and to guarantee that the project resources will be effectively utilized:

1. An entity should be established and entrusted with sole responsibility for the development and operations of the urban water supply and perhaps sewerage (Urban Water Supply Section within the Department of Water Development).
2. A coordinating body for the utilization of water resources should be established.

It is also necessary to prepare Water Work Rules for Zanzibar. Existing rules dating back to colonial times could be utilized as background material, since they are still to a limited extent applied in practice.

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 of 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.

The first step for the new institutional arrangements has been the preparation of a proposal for the organization of urban water supply organization, which was done during the planning phase in 1990. This will be followed by approval of the proposal, establishing the urban water supply organization and a water board and recruitment of staff during the first implementation phase.

Human resources development

Human resources development is a continuous process of assessing the short-comings of the manpower and administration.

Manpower and staff training needs will be defined as a result of the analysis of tasks and skills during the first implementation year. This will be followed by formulating a training strategy, and based on that, annual training plans.

The basic structure for a new manpower planning system has already been developed during the manpower inventory, carried out in the project planning phase. The manpower planning system, together with the training, will create opportunity for career development of the personnel.

The first group to be trained are the trainers, which includes staff of managerial level in the water organization and those of the technical staff with training tasks. Professional and vocational training will be arranged for a number of groups during the project implementation. The local training institutions will be used when possible, and their capacities developed.

Community education and participation

The relationship between the beneficiaries and the water authorities at present is unclear and inadequate. Information on water issues is also quite limited among the urban population. To solve these problems and to obtain the beneficiaries' contribution to the water supply, the people need to be informed, educated and motivated regarding water issues.

The household survey, which was carried out during the planning phase, indicates that in some parts of the project area people are willing to contribute to water development by providing their labor something very much appreciated. In the areas where this is possible, people must be given the chance to provide work instead of being charged for water.

The project will further study the required behavioral changes and the best ways of promoting communication between the water authorities and the beneficiaries. A communication strategy and water supply guide will be

prepared and necessary training and education programs arranged in the form of campaigns, meetings, school programs and radio and TV spots.

The main target groups for consumer education programs are mothers and children. Mothers are usually in charge of water and health matters at home and also of taking care of the small children, who are the most sensitive to water-related diseases. School children are an important link between homes and new development and knowledge.

The educational programs of the project must be planned and organized in cooperation with the Department of Education and the Department of Health. Education will be mainly given by health care personnel and teachers, who must go through project orientation.

5.4 Water supply development

The implementation of the Urban Water Supply Development is expected to be based on revised water policies and guidelines of the Zanzibar Government and also on a clear-cut action plan outlined in the Urban Water Supply Development Plan.

The construction and rehabilitation programs must depend on the progress of the financial, institutional and human resources development components, subject to frequent reviews in connection with the annual work plans.

If the physical development plan materializes, a strong donor input is required for financing of repairs and construction. The present service level must be maintained throughout the project area through a material support component, although the renovation and construction programs will concentrate on Zanzibar Town and Chake Chake. Contributions will be made to Wete and Mkoani through material support.

An effective operation and maintenance system has to be developed to ensure that the present systems and the efforts to rehabilitate and improve them will be fully utilized. Preparation of the system will be started in the beginning of the first project phase.

The water intakes of Zanzibar Town will be improved to facilitate the pumping of water to the existing network so that the full capacity of the network can be utilized. The pressure level within the network area will be improved.

The renovation of the water supply in Chake Chake would be commenced simultaneously or slightly later than that of the Zanzibar.

The construction part of the programme will be implemented by a main contractor (most likely Finnish) together with the Urban Water Organization of Zanzibar, and supervised by the consultant.

The contractor will be responsible for renovation, construction and the contractual part of drilling programs. Part of the drilling programme will be carried out by the local water organization. The actual field work will be mainly carried out by local sub-contractors.

Since the Urban Drainage and Sewerage Development and the Urban Water Supply Development Programs work in closely related sectors and similar locations, they should be implemented in close cooperation and coordination especially in terms of their activities in the Zanzibar Stone Town area.

5.5 Water resources and environmental development

Ground water development, including drilling and monitoring activities and establishing coordinating systems for ground water utilization, will commence already in the early stages of the first implementation phase.

The use of ground water is to be submitted under inter-departmental coordination (under the planned Water Board), where the Department of Water Development, together with the planned Urban Water Supply Organization, will play a leading role. Other relevant authorities will be the Department of Irrigation and the Commission of Lands and Environment.

Development of the water quality and environmental monitoring facilities and capabilities must be emphasized from the beginning of the first implementation phase and maintained throughout the project periods.

The preliminary environmental impact assessment (EIA) for the project was made during the planning phase.

The work will be continued by carrying out further EIA studies during the rainy season (the first part of the EIA report being done in the dry season).

The Department of Water Development established a small water laboratory during the planning phase. The capacities and facilities of this laboratory will be extended during the first implementation phase. Extensive water quality monitoring programs will be prepared and implemented. Special studies on ground water pollution will also be made, such as a study on pesticide pollution.

Since one of the biggest environmental problems at the moment is the condition of water intakes, plans for protection of intakes must be prepared.

Environmental awareness will be strengthened among authorities, institutions and communities, and collaboration on environmental issues intensified between various authorities and institutions.

Environmental monitoring plans to be followed in all project activities will be prepared in the early stage of the project.

6

ACTIVITIES

This section gives the framework for the activities of the project for 1991-1994. A rough time schedule for them is given in annex 2. This rough draft will be an outline for more detailed annual work plans to be prepared each year.

Sub-project 1. Economic and institutional development

The main activities are:

Financial and economic development

- The following studies will be carried out:
 - study on accounting and financial control systems
 - study on invoicing options
- Training in economics and development of financial management system
- Development and introduction of revenue billing system

Institutional arrangements and management development

- Approval of proposed urban water supply organization and staffing by RGoZ
- Preparation for establishment of urban water supply organization and recruitment of staff
- Institution building
- Preparing standards for institutional performance and the creation of a management information system

- Developing and introducing an institutional strategy and annual planning system
- Preparing job descriptions and standards
- Developing a manpower register
- Developing a personnel policy
- Carrying out management training

Human resources development

- Carrying out a task and skill analysis
- Developing a human resources development plan, including:
 - training strategy
 - manpower planning system
 - annual training plans
- Preparation of training material
- Preparation and implementation of programs for training of trainers
- Arranging vocational training

Community education and participation

- Studies to be carried out:
 - study on required behavioral changes
 - study on communication channels
- Guidelines to be developed:
 - guidelines for communication strategy
 - citizen's water supply guide
- Training and education to be implemented:
 - orientation of relevant authorities
 - orientation of health workers
 - educational campaigns
 - information spots in mass media
 - trainers of teacher's training

Sub-project 2. Water supply development

The main activities are:

Improvement of UWS schemes

- Preparation of designs, drawings and documentation
- Water works
- Implementing rehabilitation work
- Material support for DWD for water schemes
- On-the-job training
- Preparation of annual implementation programs for 1991-1994
- Preparation of implementation programme for 1995-1998 including cost estimates
- Preparation of implementation programme for 1999-2002 including cost estimates
- Updating the master plan

Operation and maintenance of UWS schemes

- Data collection and reporting system
- Leakage study
- Developing the operation and maintenance system
- Preparation of operation and maintenance manuals
- Training in operation and maintenance

Sub-project 3. Water resources and environmental development

The main activities are:

Water resources development

- Establishing a coordinating system for ground water utilization by RGoZ
- Developing a data collection and storing system:
 - ground water level monitoring
 - water quality monitoring
 - meteorological information
- Carrying out drilling and monitoring activities:
 - drilling
 - geoelectrical soundings
 - quality control
- Preparing revised maps and plans:
 - resistivity contour map
 - storativity map
 - transmitivity map
 - potentiometric map
 - chemical quality map
- Material purchases
- On-the-job training

Protection of water sources

- Preparation of plans for site selection
- Preparation of plans for intake protection zones

Environmental monitoring

- Monitoring ground water quality
- Monitoring scheme water quality
- Monitoring waste water quality
- Monitoring sea water quality
- Follow-up on the development of industry and possible pollution
- Studying the use of pesticides
- Monitoring other environmental aspects
- Studies to be carried out in the early stage of the project:
 - EIA during rainy season
 - basic studies on the spread of fecal pollution
 - basic study on the quality of waste water
 - basic study on pesticide pollution

Environmental awareness

- Training, education and orientation to be carried out:
 - orientation of authorities
 - intersectoral seminars
 - environmental issues to be included in all training programs of other sub-projects
 - training of laboratory personnel

Coordination of activities

- Preparation and implementation of action plan for joint activities with other sectors

Support services

The following activities and support services are to be implemented:

- Establishment of offices for urban water organization
- Establishment of and running of main laboratory in Zanzibar Town and a bacteriology unit in Pemba
- Establishment and running of workshops in Zanzibar Town and Pemba
- Establishment of stores for Zanzibar Town and Pemba
- Purchasing project vehicles/other purchases

7 INPUTS

7.1 Finnish inputs

Manpower

The Finnish manpower input will be strongest during the second year (1992) of the first implementation phase of the project, and will be decreased over the following years. The first year is carried out by limited staff resources.

The following expatriate specialists are required:

Project Coordinator
 Training and Management Consultant
 Water Supply Engineer
 Drilling Engineer
 Operation and Maintenance Engineer
 Construction and Maintenance Technician
 Network Technician
 Hydrogeologist (short term)
 Environmental and Laboratory Expert (short term)
 Economic Adviser (short term)
 Home office coordinator and administrator
 (short term, in Finland)

In addition, other short term consultants will be provided if the need arises.

A manpower estimate for consultants and job descriptions for expatriate specialists are presented in annexes 3 and 4 respectively.

Material and equipment

The Finnish input for the materials and equipment will be limited in the first year (1991) to include following:

- vehicles (1 or 2), tractors (1 or 2)
- limited amount of
 - drilling equipments
 - pumps
 - fittings
 - tools
 - water meters
 - spare parts
 - monitoring instruments
- limited amount of office equipment:
 - micro computer (1 pc)
 - printer (2 pc)
 - copy machine
 - other office material and stationery
- laboratory chemicals
- some training equipment and material
- basic furniture for expatriate housing

The equipment purchased during the planning phase are to be utilized, as well.

The major purchases will be done in 1992, 1993 and 1994.

7.2. Tanzanian inputs

Manpower

It is essential for the success of the project that the Department of Water Development provide the following full-time specialists for the Project Implementation Unit, which will work within the DWD:

- Officer i/c Zanzibar
- Officer i/c Pemba
- Financial Officer
- Training Officers (2)
- Water Supply Engineer
- Operation and Maintenance Engineer
- Network Technician
- Hydrogeologist
- Drilling Engineers
- Monitoring Technicians (2)
- Chemist
- Laboratory Technicians (5 - one for Pemba)
- Procurement Officer
- Accountant

This group may later form the foundation team for the proposed urban water supply organization.

Material and equipment

Fixed budget amount to be allocated to the Project in Tanzanian shillings for the procurement of spare parts and materials required to maintain the present service level. A spare parts and materials list is to be issued by the local water authorities. These supplies will be used by the local organization. The contractor and the consultant will not be involved in the use of them aside from having an advisory role, particularly in the case of the consultants.

Office and other facilities

The UWS office, workshop and store plot at Madema in Zanzibar Town and laboratory plot with ready made house in Saateni are to be provided by the Government of Zanzibar, as well as the premises needed in Pemba. Constructing/finalizing and equipping the buildings will be done by the project after the new UWS organization is approved.

The office for the Project Implementation Unit (PIU) could in the beginning be a rented house or flat. As soon as a permanent office facility for the new urban water supply organization is allocated the PIU would move in. Workshop and store facilities are needed both in Zanzibar Town and Pemba. The office, workshop and stores should be equipped and available by the end of the first implementation phase.

Adequate housing - at least 60 m² - is needed for a proper laboratory in Zanzibar. One room is needed in Pemba for the bacteriology unit. The laboratory facilities should be made ready in 1991.

8

PROJECT BUDGET

The FINNIDA budget includes the costs of Finnish staff, materials and equipment needed to finance the costs of the implementing agency, the materials and equipment required by DWD for the project, and the costs of construction contracts to be awarded.

The local budget allocation includes additional costs of the DWD and agencies involved with the project. The local allocation is 10 % of costs other than those concerning technical assistance.

The project budget for 1991-1994 is as follows (units of 1000 FIM):

	1991	1992	1993	1994	TOTAL
FINNIDA	6,000	13,000	16,000	15,000	50,000
Local component	630	630	630	630	2,520
TOTAL	6,630	13,630	16,630	15,630	52,520

A more concise budget is given in annex 5. It will be revised in the annual work plan. Operational budget will be presented in the annual work plan.

9 ASSUMPTIONS AND EXTERNAL FACTORS

9.1 Financial and organizational sustainability

The progress of the project as a whole depends on the progress of institutional and legislative development. The basic strategy for achieving the self-sustainability of the urban water supply organization is a threefold process of creating external preconditions (legal and financial basis for operation), improving institutional performance (showing results) and training, all partly at the same time.

The two latter factors are mainly depending on the project activities, but strongly affected by the realization of external factors, which are under the responsibility of the political bodies and authorities of Zanzibar.

Any institution needs time for adopting reforms. Therefore it is preferred that providing the urban water supply organizations with the necessary management authority, financial independence and legal basis for operation takes place gradually.

Consequently, the measures needed from the Government should be taken in sequence. A course of necessary actions for the smoothly progress is to be summarized and scheduled as follows:

By the end of the year 1991

- The Urban Water Supply Section (UWSS) has been formed within the Department of Water Development.
- Proposals for a decree to establish Zanzibar Urban Water Supply Authority and Ground Water Ordinance have been submitted to the political decision-makers.

By the end of the year 1992

- Administrative preparations have been completed for the UWSS to function autonomously on a trial basis.

By the end of the year 1993

- The UWSS has readiness and right to master an own account and to charge for its services
- Relations between the UWSS and beneficiaries as well as the rights and responsibilities of consumers have been defined in the Water Work Rules.

By the end of the year 1994

- The UWSS has readiness to start functioning as an Urban Water Supply Body and possesses legal basis for its operation.

However, it is important to keep in mind that also the best-designed institutional change will always encounter unforeseen obstacles that require creative reprogramming.

The Government of Zanzibar should, in these circumstances, undertake to guarantee that the standards achieved as a result of the resources contributed to the project will be maintained on a long-term basis. This would mean that any deficit in income from charges required to maintain these standards will be made up for with government funds.

The local component allocation - 10 % of investment related costs - is a precondition for full FINNIDA's budget allocation.

9.2 Other external factors

Other factors which may delay the scheduled implementation of the project are:

- delays in procurement from abroad
- delays in transportation of equipment due to difficulties in connections between Dar es Salaam, Zanzibar Town and Pemba
- power failures, especially in Pemba
- inadequacy of staff for training
- delays in the progress of the sewerage and drainage project of Stone Town
- non-availability of adequately skilled local contractors

PROJECT ORGANIZATION

The Competent Authorities of the two Governments for the implementation of the Project are the Ministry for Foreign Affairs of Finland, represented in Finland by the Finnish International Development Agency, FINNIDA, and in Tanzania by the Embassy of Finland in Dar es Salaam, and the Ministry of Finance of Tanzania. However, in matters pertaining to the substance of the project and not affecting the overall responsibilities of the Government of Tanzania, the Ministry of Water, Construction, Energy, Lands and Environment of Zanzibar/Department of Water Development has the right to represent the Ministry of Finance.

The project will have a project implementation unit (PIU), which consists of the staff of the Finnish implementing agency and full-time specialists from DWD appointed for the project. This unit (PIU) will work within the organization of DWD.

The project will be supervised by a steering committee, composed of representatives from:

FINNIDA
Ministry of Finance, Tanzania
Ministry of Water, Construction, Energy, Planning
and Environment, Zanzibar
Ministry of Finance, Zanzibar
Ministry of Planning, Zanzibar
Ministry of Agriculture, Zanzibar
Ministry of Health, Zanzibar
Ministry of Education, Zanzibar
Commission for Lands and Environment, Zanzibar
Municipal Council, Zanzibar
Project Implementation Unit
Stone Town Conservation and Development Authority

The organization of the project is presented in figures 5/1 and 5/2.

11 REPORTING, MONITORING AND EVALUATION

11.1 Reporting systems and reports

The basic plans of the project as defined in terms of the objectives, outputs, inputs, activities and other aspects are formulated in:

- The project document
- The annual plan of operation (annual work plan), which will detail the annual activities, outputs and other major aspects related to the year's operations.

The annual plan of operation will be prepared by the project, and sent through the Finnish implementing agency to FINNIDA for approval two months before the end of the year. The first annual plan of operation will be submitted at the latest two months after the commencement of the project.

The purpose of the reporting is to compare the progress of the implementation with the planned progress, and the impact of the project with the planned impact. The former is accomplished by comparing the planned and achieved outputs. The latter is carried out by comparing the planned development and achievements with the actual development and achievements using the formulated achievement and development indicators. At the same, an analysis of the factors influencing the impact, the need to revise objectives, the state of the assumptions, etc. will be carried out.

The reports will be based on the internal monitoring and evaluation system of the project. The following reports will be produced:

- Actual monthly expenditures and a comparison with planned expenditures
- Quarterly expenditures and estimates for the following quarters of the year. The quarterly reports will also include comparison of the planned and actual progress in terms of achievement outputs. They are to be submitted within a month of each quarter's end.

- Annual reports are to be submitted within 45 days after the end of each year which:
 - compare the planned and actual achievement by using achievement indicators
 - compare the planned and actual development by using development indicators as well as assess the probability of achieving the planned development
 - compare the planned and actual progress in terms of achievement outputs as well as assess the possibilities of achieving the planned outputs over the remaining duration of the project
 - analyze the factors which influence the annual achievements, the state of assumptions, etc. as well as suggest eventual required actions to be taken
- The final report, which includes the comparison of planned and actual development as well as planned and real outputs, inputs, etc. The final report also includes the review of the factors having an influence on the outcome of the project, the state of the assumptions, etc. Furthermore, the final financial statement as well as a detailed inventory of vehicles, equipment, materials, etc. will be made. The final report is to be submitted within two months after the termination of the project.
- Workshop and seminar reports/minutes will be annexed to the quarterly/annual reports.

11.2 Monitoring

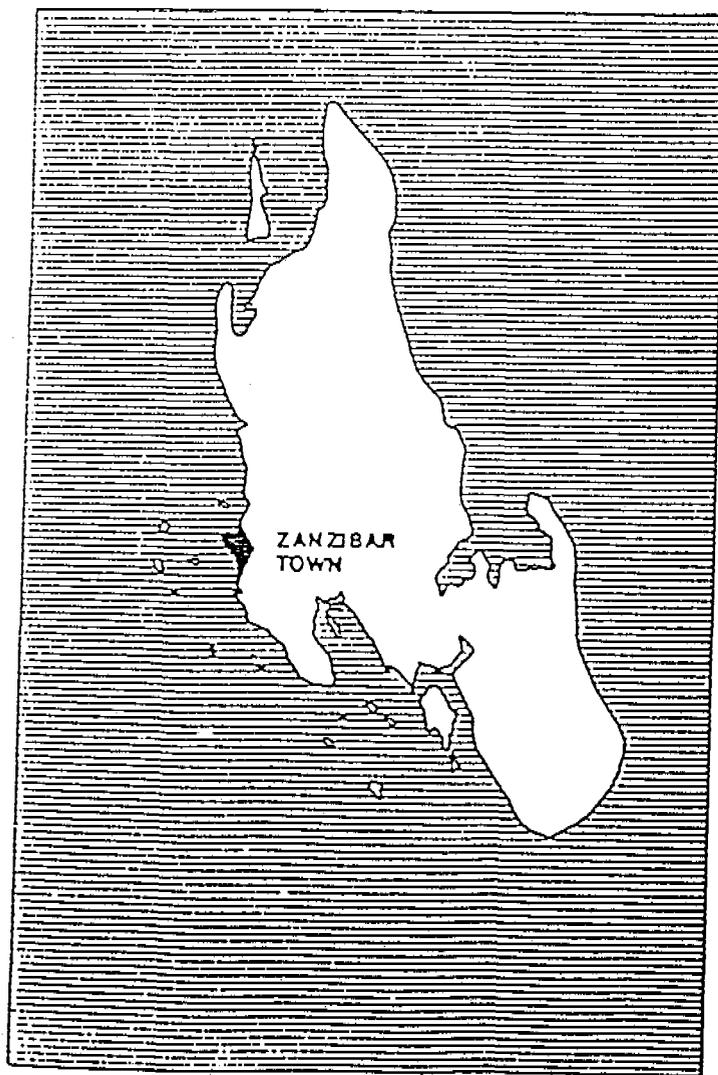
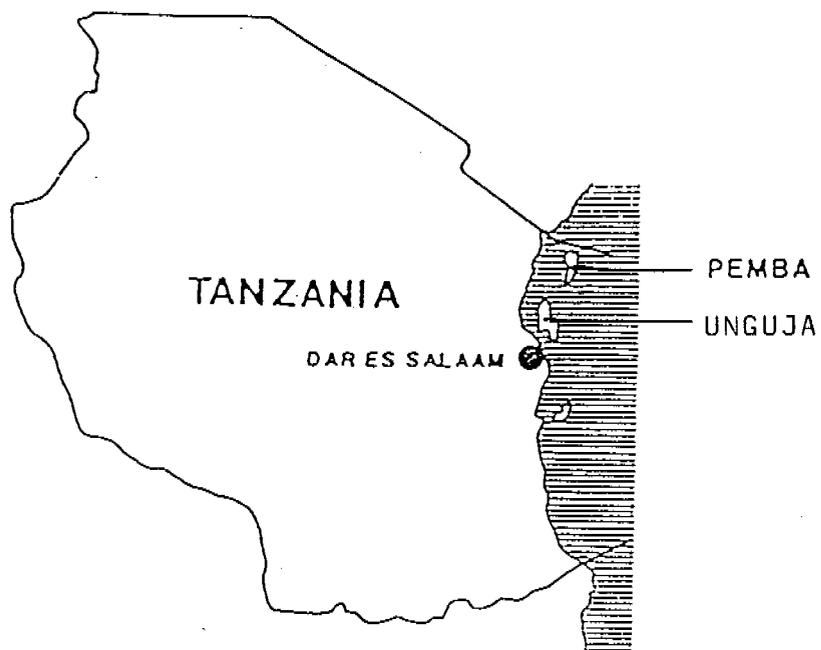
There will be an annual field review mission by a monitoring team to review and monitor the progress of the project and recommend required actions. The first mission will take place after the first annual plan of operation is ready, and thereafter annually after the annual report is ready. The monitoring team will be appointed by FINNIDA and the executing agency will be invited to nominate a member of the team.

11.3 Evaluation

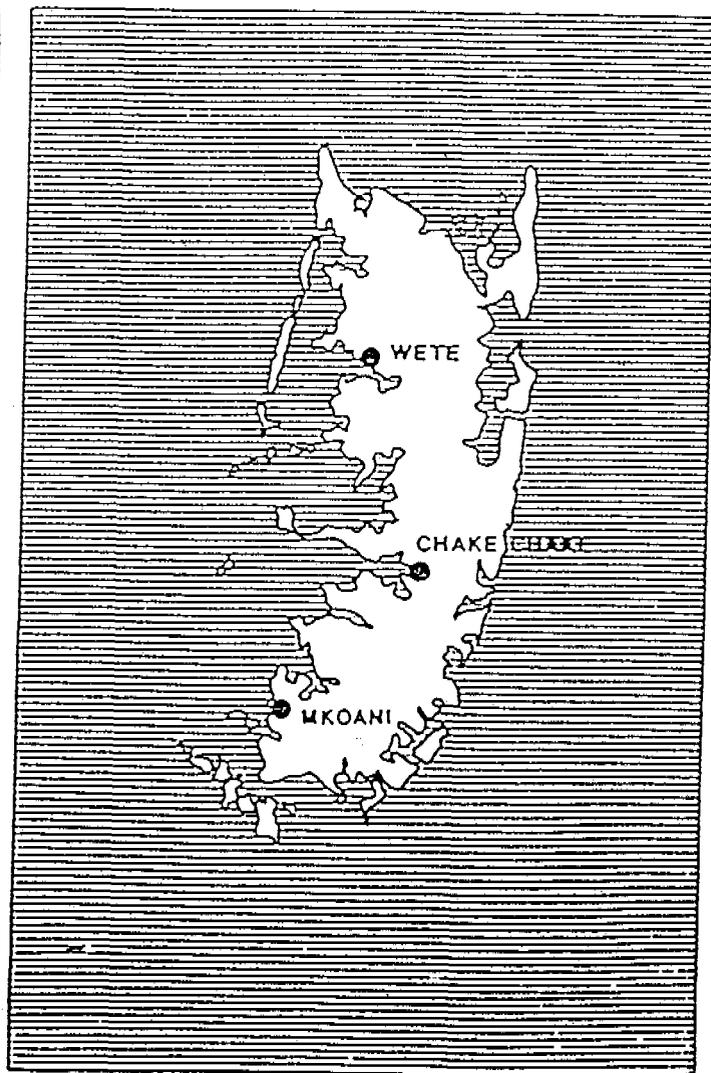
A mid-term evaluation will be made two years after commencement of the project. The evaluation will assess the achievement of planned development and progress and will make recommendations for improving project efficiency, effectiveness, relevance and impact. FINNIDA will appoint the mid-term evaluation team and the executing agency will be invited to appoint a member of the evaluation team.

FINNIDA will nominate, if needed, a team for the execution of the final project evaluation, and carry out an appraisal of the project document for Phase II of Zanzibar Urban Water Supply Project.

FIGURE 1. MAP OF ZANZIBAR



UNGUJA



PEMBA

FIGURE 2. GROUND WATER DEVELOPMENT AREAS OF UNGUJA

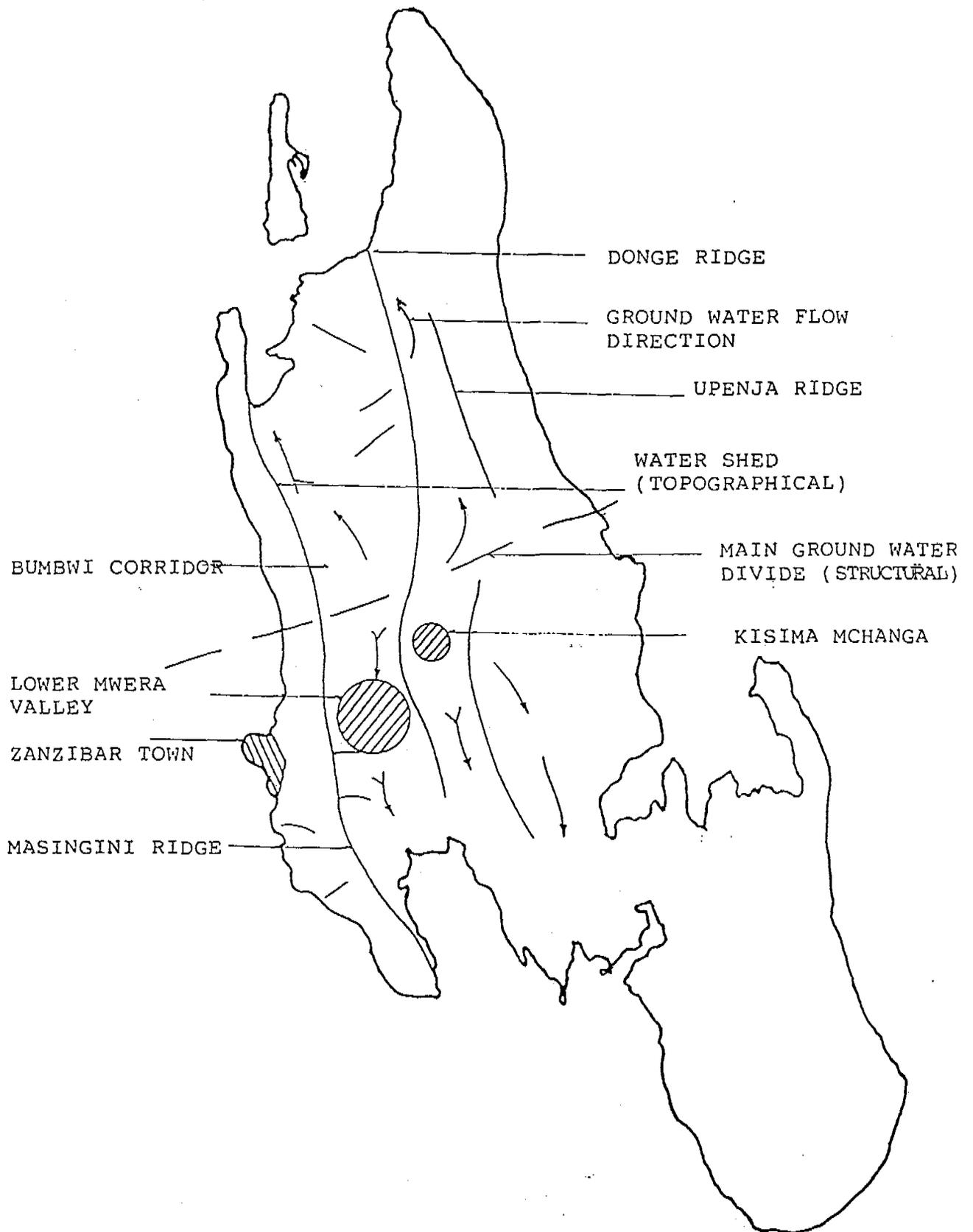


FIGURE 3/1. ORGANIZATIONAL CHART OF MINISTRY OF WATER, CONSTRUCTION, ENERGY, LANDS AND ENVIRONMENT

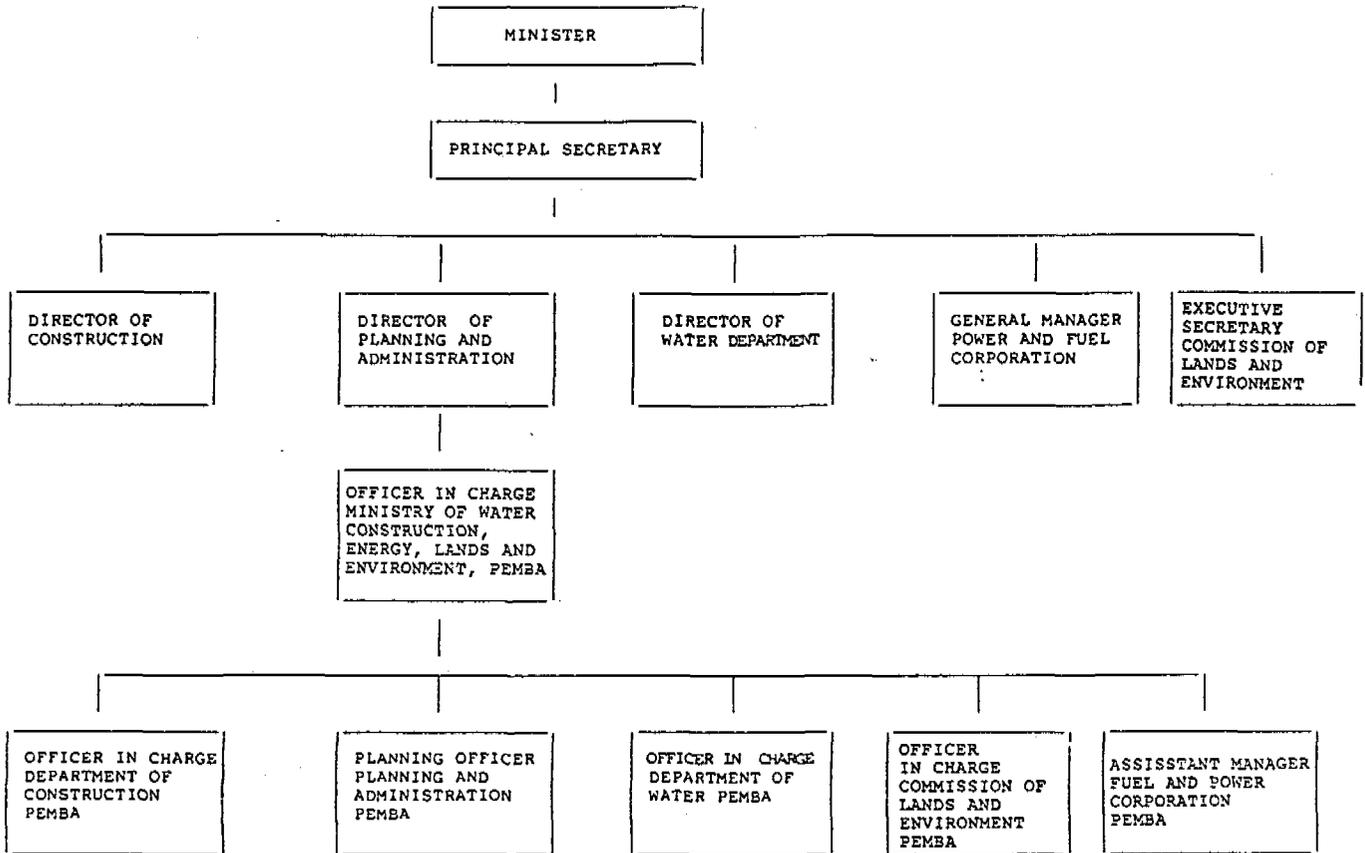


FIGURE 3/2. PRESENT ORGANIZATION OF THE WATER SUPPLY

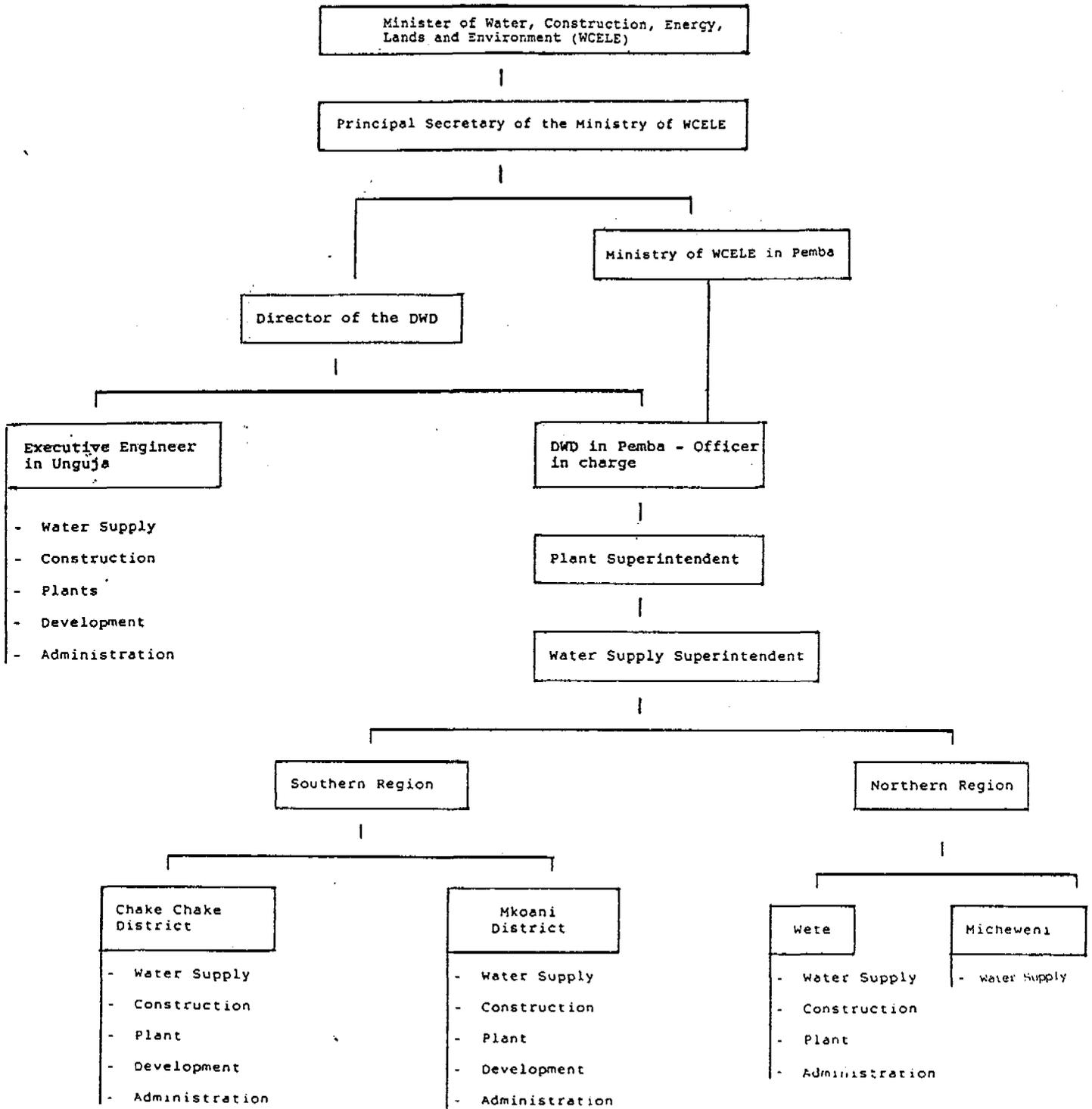


FIGURE 4/1. EXISTING ORGANIZATIONAL CHART OF DEPARTMENT OF WATER DEVELOPMENT - UNGUJA

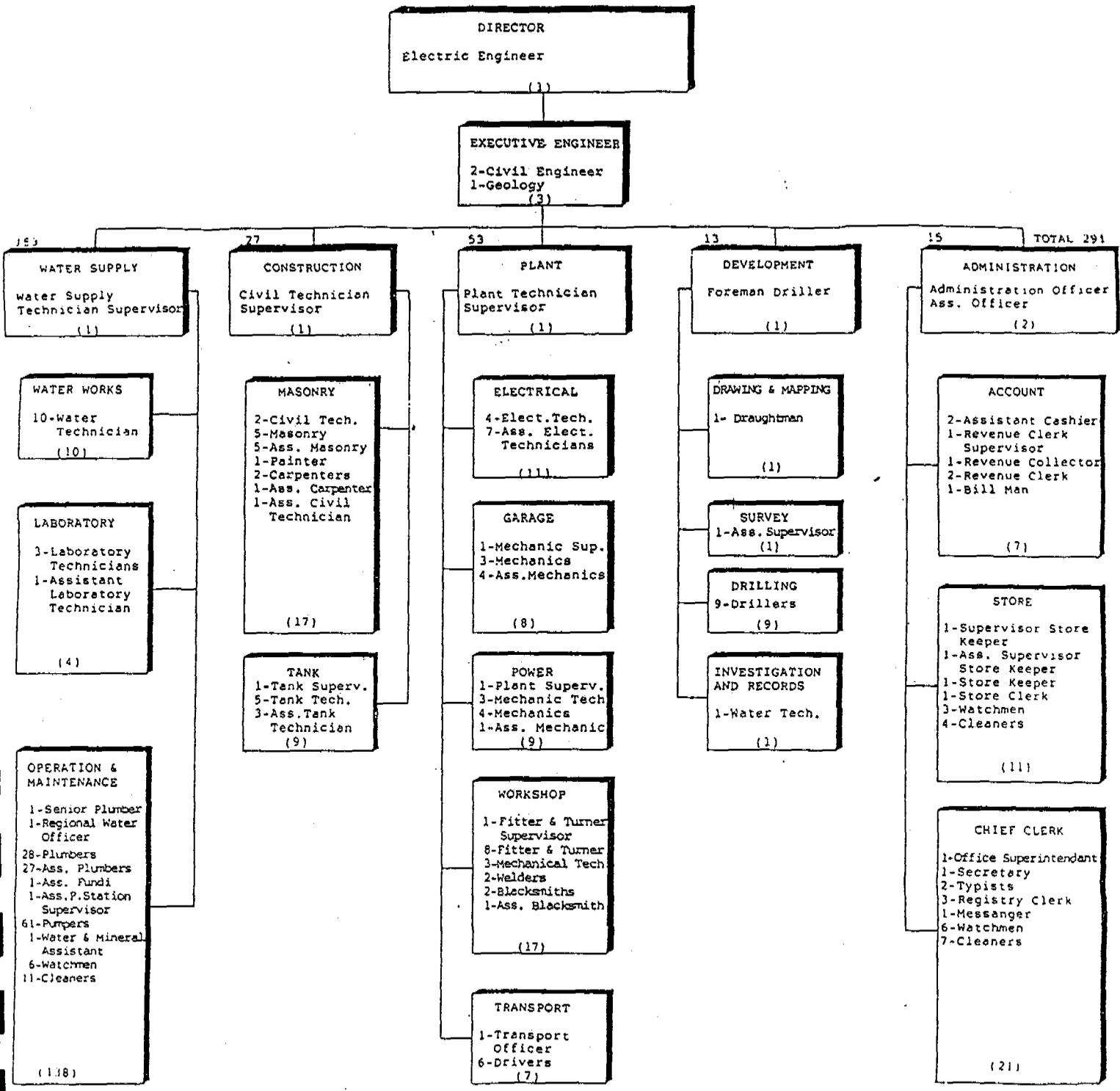
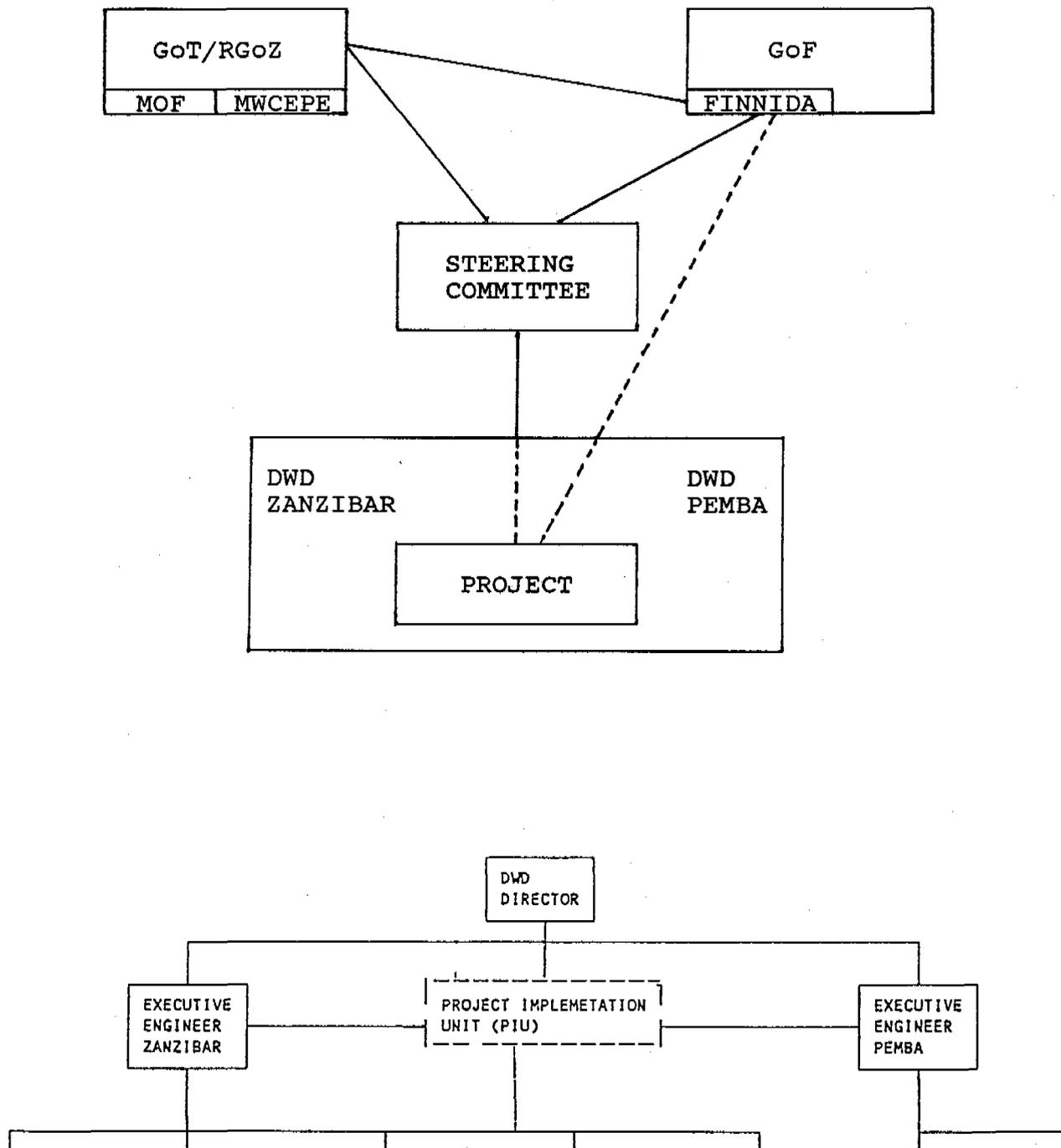
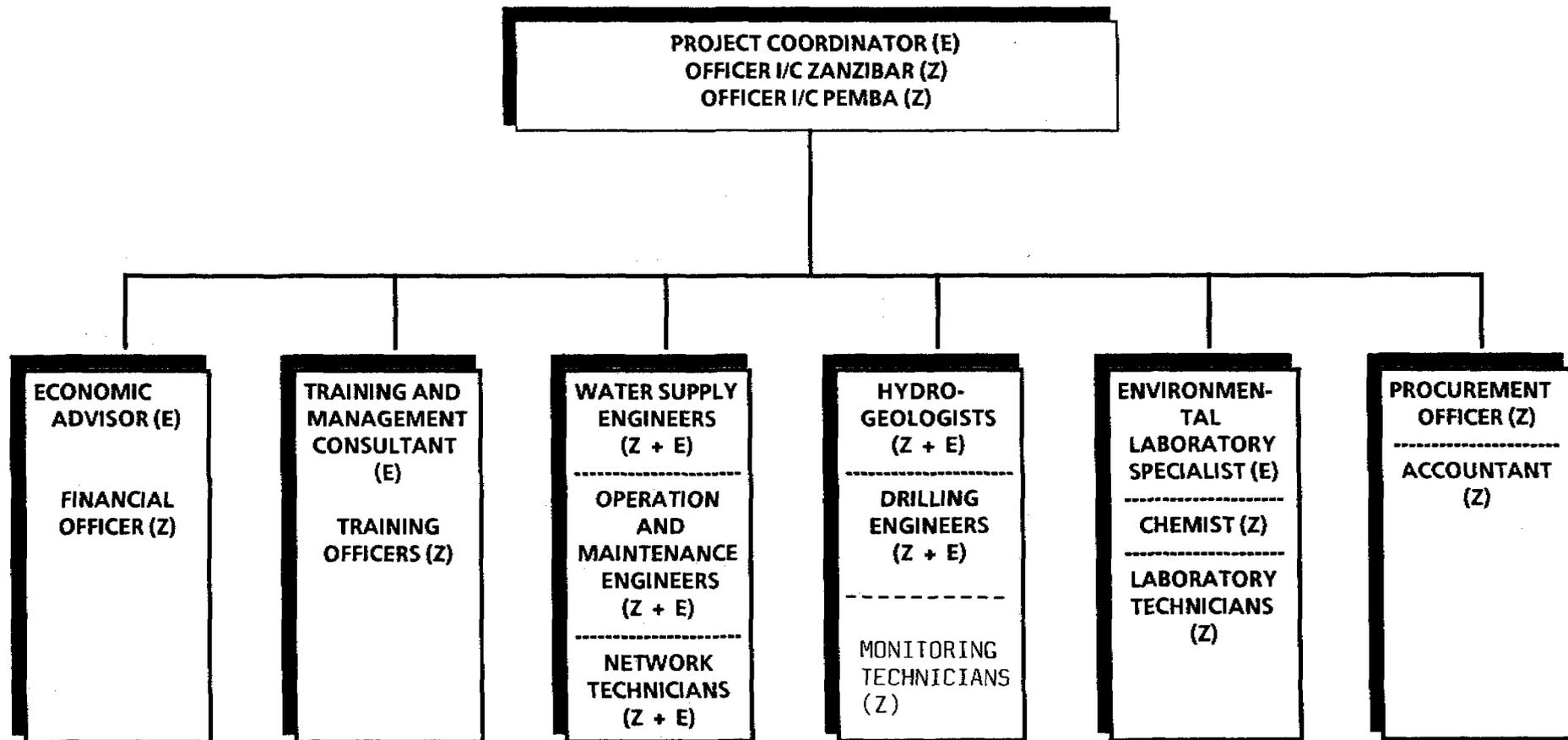


FIGURE 5/1. PROJECT ORGANIZATION



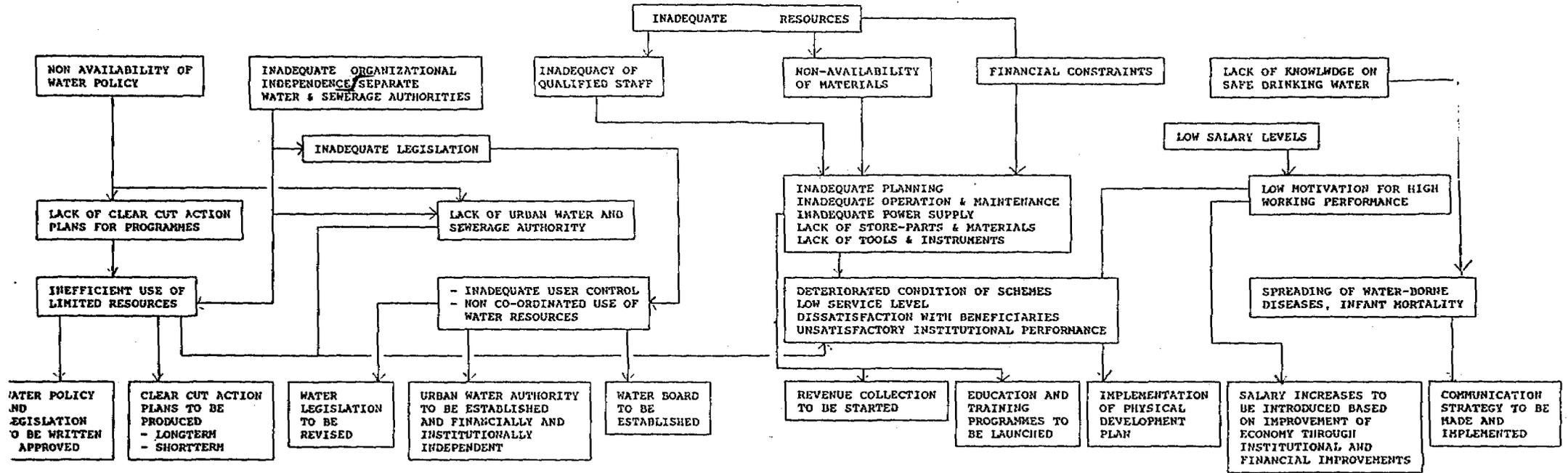
PROJECT IMPLEMENTATION UNIT



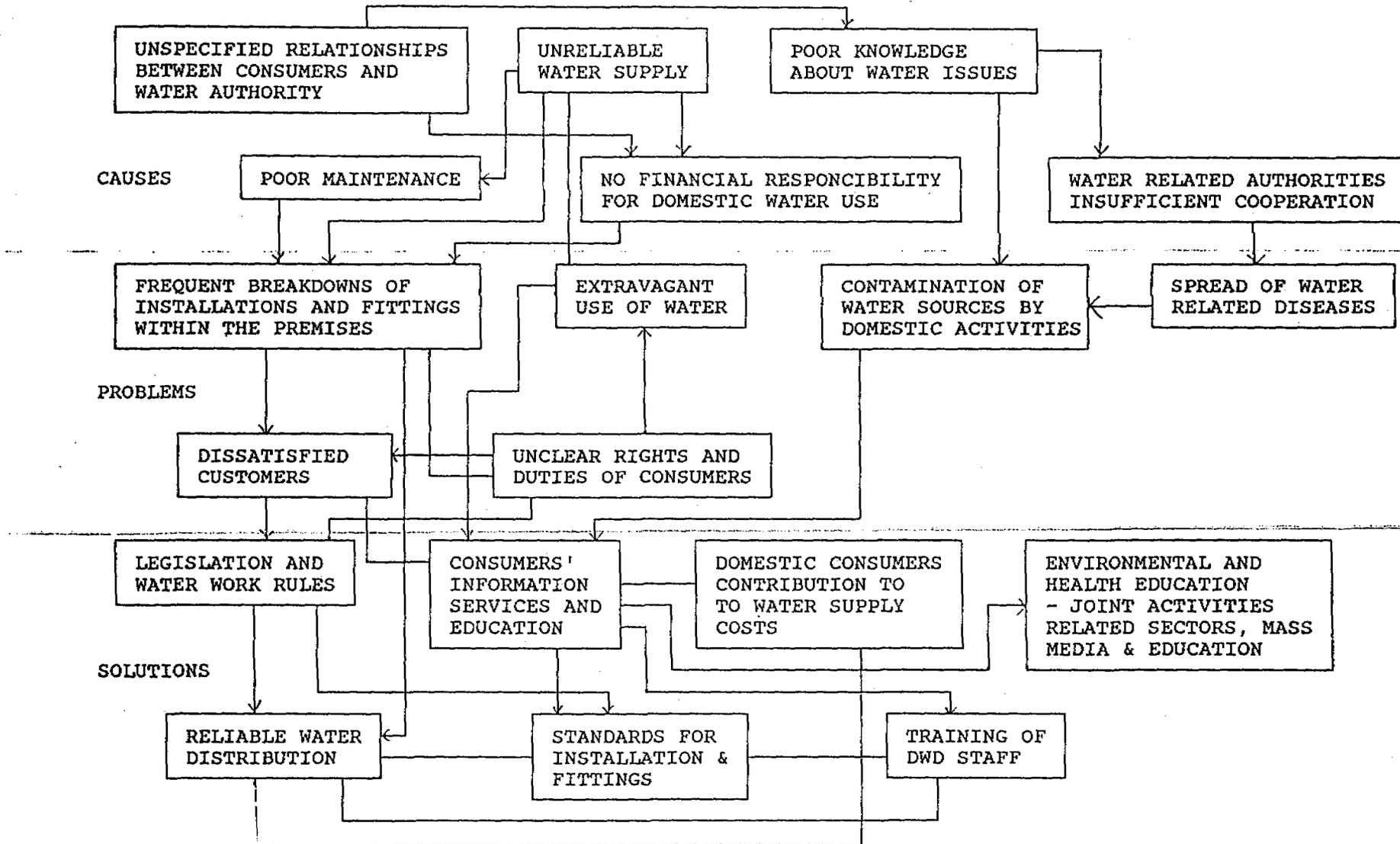
E = EXPATRIATE
Z = ZANZIBARIAN

FIGURE 5/2. PROJECT IMPLEMENTATION UNIT (PIU)

PROBLEM ANALYSIS



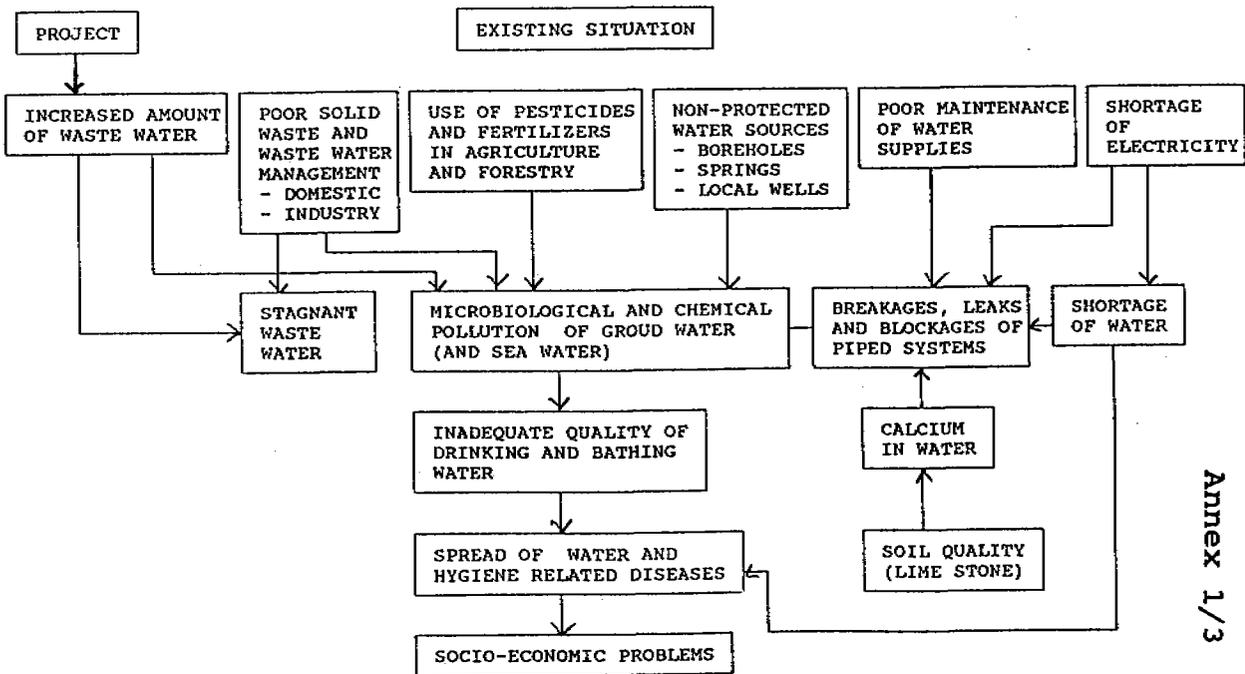
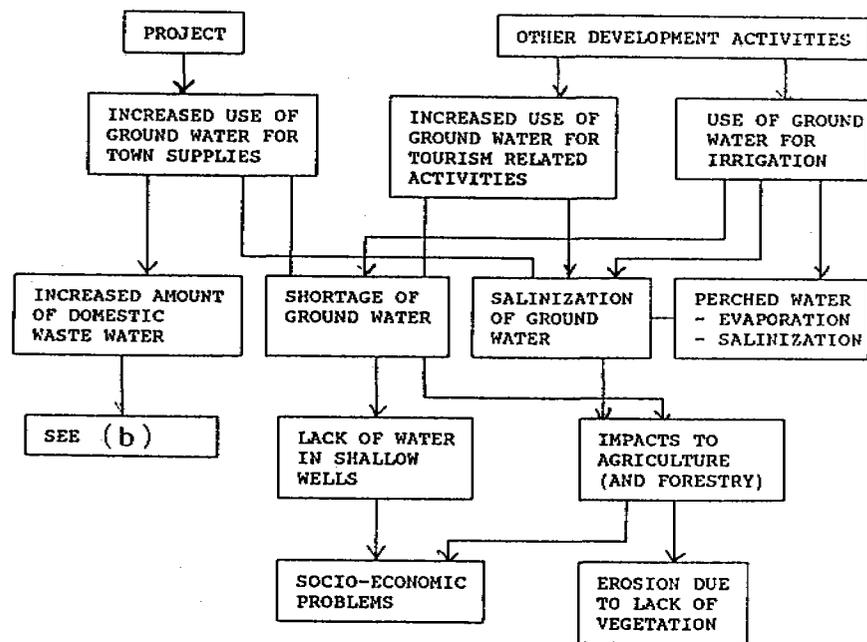
COMMUNITY PARTICIPATION ANALYSIS



ENVIRONMENTAL ANALYSIS

(a) Problems related to increased use of ground water

(b) Problems related to quality of water and health



TENTATIVE WORK PLAN 1991-1994

	1991	1992	1993	1994
1. ECONOMIC AND INSTITUTIONAL DEVELOPMENT				
1.1 Financial and economic development				
Studies				
- accounting and financial control systems				
- study on invoicing				
Training				
Revenue collection system				
1.2 Institutional arrangements and management development				
Approval of proposed UWA organization and staffing				
Preparation for establishment of UWA and recruitment of staff				
Institution building				
Standards for institutional performance and creation of management information system				
Institutional strategy and annual planning system				
Job description and standards				
Manpower registry				
Personnel policy				
Management training				

1.3 Human resources development				
Task and skill analysis	---			
Training strategy	---	---		
Manpower planning system	---	---	---	---
Annual training plans	---	---	---	
Preparation of training material	---	---	---	
Training of trainers		---	---	
Vocational training	---	---	---	---
1.4 Community education and participation				
Studies				
- required behaviour changes	---		---	
- communication vehicles	---		---	
Guidelines				
- communication strategy		---		---
- citizen's water supply guide		---		
Training and education				
- orintation of relevant authorities		---		
- orientation of health workers			---	
- educational campaigns		---	---	---
- information spots in mass media		---	---	---
- teacher's trainers training			---	

<p>2. WATER SUPPLY DEVELOPMENT</p>				
<p>2.1 Improvement of UWS schemes</p>				
<p>Designs and drawings and documentation:</p>				
<p>Intake structures - Zanzibar - Pemba</p>				
<p>Water works - Zanzibar - Pemba</p>				
<p>Distribution networks - Zanzibar - Pemba</p>				
<p>Rehabilitation work - Zanzibar - Pemba</p>				
<p>Water schemes: Material support for DWD</p>				
<p>On-the job training</p>				
<p>Annual implementation programmes for 1991-1994 - Zanzibar - Pemba</p>				
<p>Implementation programme for 1995-2000 including cost estimates - Zanzibar - Pemba</p>				
<p>Updated master plan</p>				

2.3 Operation and maintenance of UWS schemes				
Data collection and reporting system				
- Zanzibar				
- Pemba				
Leakage study				
- Zanzibar				
- Pemba				
Developing the O&M system				
Preparation of O&M manuals				
Training in O&M				
3. WATER RESOURCES AND ENVIRONMENTAL DEVELOPMENT				
3.1 Water resources development				
Coordinating system for ground water utilization				
Data collection and storing system				
- ground water level monitoring				
- water quality monitoring				
- meteorological information				
Drilling and monitoring activities				
- drilling				
- geoelectrical soundings				
- quality control				
Revised maps and plans				
- ground water				
- resistivity contour map				
- storativity map				
- transmittivity map				
- potentiometric map				
- chemical quality map				
Material purchase				
On-the-job training				

3.2 Protecting water sources				
- plans for site selection	-----	----		
- plans for intake protection zones	-----	----		
3.3 Environmental monitoring				
Monitoring				
- ground water quality	-----	-----	-----	-----
- scheme water quality	-----	-----	-----	-----
- waste water quality	-----	-----	-----	-----
- sea water quality	-----	-----	-----	-----
- pollution of industry	-----	-----	-----	-----
- use of pesticides	-----	-----	-----	-----
- other environmental aspects	-----	-----	-----	-----
Studies				
- EIA during rainy season	-----	-----		
- baseline studies on spread of fecal pollution	-----	-----		
- baseline study on quality of waste water	-----	-----		
- baseline study on pesticide pollution	-----	-----		
3.4 Environmental awareness				
- orientation of authorities	-----	-----		
- intersectoral seminars	-----	-----		
- environmental issues in HRD and CP programmes	-----	-----		
- Training of laboratory personnel	-----	-----		
3.5 Coordination of activities				
Action plan for joint activities with other sectors		-----		
4 ANNUAL WORK PLANS				
Annual work plan 1991	-----			
Annual work plan 1992	-----			
Annual work plan 1993			-----	
Annual work plan 1994				-----

5. SUPPORT SERVICES, IMPLEMENTATION AND PURCHASES				
UWA, Offices, impl.				
UWA, Laboratory, impl.				
UWA, Workshop, impl.				
UWA, Stores, impl.				
Project vehicles/ sparepart purchases				
Project stationary purchases				

MANMONTH ESTIMATE 1991-1994

EXPATRIATE CONSULTANT/ KEH-classification	1991			1992			1993			1994			Z	F	Tot
	J	F	M	J	F	M	J	F	M	J	F	M				(months)

LONG TERM:															
Project Coordinator/ KEH 2	*****			*****			*****			*****			44	0	44
Training and Management Consultant/KEH 3	*****			*****			*****			*****			34	0	34
Water Supply Engineer/ KEH 3	*****			*****			*****			*****			45	0	45
Drilling Engineer/ KEH 4	*****			*****			*****			****			23	0	23
Operation and Maintenance Engineer/KEH 3	..*..			*****			*****			*****			23	0	23
Construction and Manintenance Technician/KEH 4	*****			*****			*****			*****			29	0	29
Network Technician/ KEH 4	*****			*****			*****						23	0	23
SHORT TERM:															
Hydrogeologist/ KEH 2	...**			..** ..**			...** ...**			..*** ..***			7	3	10
Environmental and Laboratory Expert/KEH 2	....			..****			.....*****.....			..***..			10	3	13
Economic Advisor/ KEH 2				*****.....			*****.....			****.....			10	2	12
Other short term and back-up personnel	(to be determined later)												12	7	19
HOME OFFICE:															
Home Office Coordinator/ KEH 1	.....*			.....*			.....*			.....*			2	18	20
Home Office Secretary/ KEH 5	.....*						.....*						2	22	24
												264	55	319	

**** full time Work in Zanzibar (Z)
 part time Work in Finland (F)

JOB DESCRIPTIONS

Job Description, Project Coordinator

The main duties of the Project Coordinator are the co-ordination of the technical assistance activities of the project as well as - together with the Officers i/c Zanzibar and Pemba - the overall management of all the sub-projects.

The tasks include but are not limited to the following

- (a) Coordinating the execution of all the sub-projects and liaise with the executing and participating organizations;
- (b) Coordinating the preparation of internal monitoring and evaluation system of the project, as well as all reporting;
- (c) Coordinating the arrangement of all the specified meetings, workshops and seminars;
- (d) Managing the implementation project reviews, preparation of plans, monitoring, evaluation and reporting;
- (e) Participating in all planning, implementation and evaluation;
- (f) Coordinating all inhouse training (including orientation training)

Job Description, Training and Management Consultant

The duty of the Training and Management Consultant is, together with the Economic Adviser, to manage the sub-project "Economic and Institutional Development", especially being responsible of the components: "Institutional arrangements and management development", "Human resources development" and "Community education and participation", and to be in charge of all training activities of the project. The tasks include:

- (a) Planning, implementation and evaluation of the institutional development of the executing organization;
- (b) Assisting in planning, implementation and evaluation of training, which supports the implementation of other sub-projects;
- (c) Assisting in planning, implementation and evaluation of inhouse training programmes (including orientation training);
- (d) Planning, implementation and evaluation of on-the-job training of management and middle management staff;
- (e) Participation in all planning and implementation as training expert;
- (f) Training of staff of the executing and participating organizations;
- (g) Planning consumer education activities, consumer participation methods and consumer participation evaluation system;
- (g) Reporting the progress of the relevant project components.

Job Description, Water Supply Engineer

The main responsibility of the Water Supply Engineer is to manage the sub-project "Water Supply Development". The duties of Water Supply Engineer include:

- (a) Preparation of plans for improvement of the water systems;
- (b) Revising the Master Water Plan;
- (c) Conducting leakage study and leakage protection planning;
- (d) Assisting in training the staff of the executing agency to develop a planning capability;
- (e) Assisting in monitoring, evaluation and training related to the O & M elements in the project;
- (f) Conducting review and design of the primary distribution system elements;
- (g) Preparation of standard design details for secondary distribution system and house connections;
- (h) Conducting review and design of water storage facilities;
- (i) Assisting in system monitoring and control;
- (j) Assisting in contract administration and supervision;
- (k) Coordinating of procurement and delivery of material support component;
- (l) Reporting the progress of the relevant project components.

Job Description, Drilling Engineer

The Drilling Engineer will be responsible for commencing the drilling operations with two drilling units.

The duties include:

- (a) Organizing and training the drilling teams to carry out the drilling work;
- (b) Preparing borehole construction designs with the local hydrogeologist;
- (c) Arrangements for test pumping, organizing of test pumping teams, commencing the test pumping activity and doing the related data processing;
- (d) Following up the collection of hydrogeological and drilling data;
- (e) Training of the staff of the executing agency;
- (f) Preparing of future drilling programmes with the local hydrogeologist;
- (g) Procuring of drilling material and spare parts for the drilling rig;
- (h) Reporting on the drilling and test pumping activities with the local hydrogeologist.

Job Description, Operation and Maintenance Engineer

The Operation and Maintenance Engineer will be in charge of the component "Operation and maintenance of UWS schemes".

The duties include:

- (a) Guidance on preparing O & M manuals by the staff of the executing agency;
- (b) Supervising and administrating the contracts for extending the primary distribution system and providing additional water storage. This includes resolving contractual disputes, claim negotiations, etc;
- (c) Advising and assisting local sub-consultants in project supervision and administration;
- (d) Arrangements related to maintenance of project vehicles;
- (e) Data collection and participation in mechanical and construction design work;
- (f) Supervising and administrating contracts in relevant parts
- (g) Assistance with procurement of materials for the project;
- (h) Reporting the progress of the relevant project component.

Job Description, Construction and Maintenance Technician

The duties include:

- (a) Participating in design work in relevant parts;
- (b) Organizing of maintenance systems;
- (c) Training of the staff of the executing agency in mechanical works and maintenance;
- (d) Site supervision of the executing agency in construction works on the water system;
- (e) Monitoring, evaluation and training inputs related to contract supervision and administration;
- (f) Reporting the progress of the relevant project component.

Job Description, Network Technician

The duties of the Network Technician include:

- (a) Responsibility for everyday operational project activities in Pemba. Duty station Chake Chake;
- (b) Organizing of O & M system in Pemba;
- (c) Coordinating of collection of monitoring results and data for design work in Pemba. Participating in design work within relevant parts;
- (d) Supervising of preparation of O & M manuals in Pemba;
- (e) Reporting the progress of the relevant project activities.

Job Description, Hydrogeologist (short term)

The main duty of the hydrogeologist is to follow up the implementation of the component "Water resources development" including:

- (a) Assistance to development of coordinating system for ground water utilization;
- (b) Development of ground water monitoring system. Interpretation of monitoring results;
- (c) Preparation of well field designs and drilling plans. Preparation of test pumping programmes and interpretation of results;
- (d) Revision of maps and plans;
- (e) Participating in material purchase;
- (f) Participating in planning of training in relevant fields;
- (g) Reporting the progress of the relevant project component.

Job Description, Environmental and Laboratory Expert (short term)

The duty of the Environmental and Laboratory Expert is to follow up the environmental development activities of the project including:

- (a) Assisting in developing the protection plans for water sources;
- (b) Establishing water laboratories (Zanzibar and Pemba) and planning water quality monitoring in Zanzibar and Pemba;
- (c) Planning and implementing environmental monitoring activities and environmental studies;
- (d) Participating in planning, implementation and evaluation of environmental training and education;
- (e) Assisting in preparation of action plan for joint activities between different sector organizations;
- (g) Reporting the progress of the relevant project components.

Job Description, Economic Adviser (short term)

The duty of the Economic Adviser is to coordinate the execution of the component "Financial and economic development". The tasks are to

- (a) Plan, partly implement and follow up all the activities of the project component "Policy and economic development";
- (b) Participate in all planning, implementation and evaluation as a financial and economic expert;
- (c) Plan and implement the system for financial reporting of the project;
- (d) Train staff of the executing and participating agencies;
- (e) Reporting the progress of the relevant project component.

Job Description, Electrical Engineer (short term)

- (a) Evaluation of the present electrical installations, assess the future electricity consumptions and the level of the control system;
- (b) Reviewing and planning of the electrical standard designs of water supplies;
- (c) Reviewing and creating material for O&M training
- (d) Monitoring, evaluation and training inputs to the contract supervision;
- (e) Reporting the progress of the relevant project activities.

Job Description, Project Coordinator (Home office)

Duties

- (a) Responsible for all the administrative activities of the project in Finland, including accounting and cost monitoring
- (b) Overall responsibility of reporting the project progress and monitoring towards FINNIDA
- (c) Overall management and supervision of the home-office work for the project
- (d) Responsible for the recruitment of expatriate personnel
- (e) Responsible for planning the orientation training in Finland
- (f) Assisting the mobilization of the project, arrangement of housing facilities, vehicles and procurements from Finland
- (g) Available for short time consultancy for the project in relevant areas

Job Description, Project Secretary (Home office)

Duties

- (a) Assisting in all administrative activities regarding the project in Finland
- (b) Preparing the statements of accounts for FINNIDA
- (c) Cost monitoring
- (d) Duties related to purchasing:
 - inquiries
 - ordering
 - contacts to forwarding companies
- (e) Correspondence between the project, home office and FINNIDA
- (f) Assisting in preparing project reports

ANNUAL BREAKDOWN OF PROJECT BUDGET ACCORDING TO FINNIDA CODES

Code	Specification	1991	1992	1993	1994	TOTAL
2131-3	Fees and wages (Expatriate experts) (including home office support)	3,434,960	5,470,248	4,173,359	3,965,005	17,043,572
2131-3	Travelling, accommodation (Expatriate experts)	445,949	960,934	999,096	1,039,360	3,445,339
2133-1	Fees and wages (Zanzibarian experts)	80,000	350,000	370,000	400,000	1,200,000
2133-1	Travelling, accommodation	30,000	50,000	50,000	50,000	180,000
2153-7	Fees and wages (Other local pers.)	25,000	150,000	160,000	170,000	505,000
2153-7	Travelling, accommodation	15,000	20,000	20,000	20,000	75,000
2311-1	Services, Finland (communications)	70,000	80,000	80,000	80,000	310,000
2313-9	Services, Tanzania (communications)	60,000	50,000	50,000	50,000	210,000
	Finland					
2221-7	Consumption equipment*	80,000	220,000	250,000	280,000	830,000
2321-4	Recurrent costs*	30,000	100,000	130,000	150,000	410,000
2331-7	Others and unspecified*	0	70,000	70,000	40,000	180,000
	Tanzania					
2223-5	Consumption equipment*	70,000	100,000	170,000	170,000	510,000
2323-2	Recurrent costs*	60,000	30,000	30,000	30,000	150,000
2333-5	Others and unspecified*	40,000	40,000	100,000	40,000	220,000
2233-8	Unspecified goods*	40,000	50,000	50,000	50,000	190,000
3211-3	Investment equipment, Finland*	530,000	1,900,000	6,000,000	4,900,000	13,330,000
3212-2	Investment equipment, other IC*	600,000	1,800,000	1,500,000	1,800,000	5,700,000
3213-1	Investment equipment, Tanzania*	160,000	350,000	600,000	600,000	1,710,000
3221-6	Consumption equipment, Finland*	90,000	100,000	100,000	100,000	390,000
3222-5	Consumption equipment, other IC*	40,000	100,000	50,000	40,000	230,000
3223-4	Consumption equipment, Tanzania*	20,000	40,000	60,000	60,000	180,000
3231-9	Unspecified goods, Finland*	60,000	100,000	180,000	180,000	520,000
3232-8	Unspecified goods, other IC*	20,000	50,000	200,000	200,000	470,000
3233-7	Unspecified goods, Tanzania*	40,000	40,000	40,000	40,000	160,000
	TOTAL	6,040,909	12,221,182	15,432,455	14,454,365	48,148,911
	Contingencies 10%	589,091	1,408,818	1,197,545	1,175,635	4,371,089
	TOTAL	6,630,000	13,630,000	16,630,000	15,630,000	52,520,000
	FINNIDA total (FIM)	6,000,000	13,000,000	16,000,000	15,000,000	50,000,000
	Zanzibar, calculated total (FIM)	188,000	509,000	953,000	868,000	2,518,000
	Zanzibar, average (FIM)	630,000	630,000	630,000	630,000	2,520,000
	Zanzibar, average (TAS)	31,500,000	31,500,000	31,500,000	31,500,000	126,000,000

Local component is calculated to be 10 % of total investment and procurement costs (marked by *)

ANNUAL BREAKDOWN OF PROJECT BUDGET TO CONSULTANCY SERVICES, RECURRENT COSTS AND INVESTMENT COSTS

Specification	1991	1992	1993	1994	TOTAL
Consultancy services	3,880,909	6,431,182	5,172,455	5,004,365	20,488,911
Recurrent costs					
a) procurements*	470,000	850,000	1,010,000	960,000	3,290,000
b) others	280,000	700,000	730,000	770,000	2,480,000
Investment costs*	1,410,000	4,240,000	8,520,000	7,720,000	21,890,000
TOTAL	6,040,909	12,221,182	15,432,455	14,454,365	48,148,911
Contingencies 10%	589,091	1,408,818	1,197,545	1,175,635	4,371,089
TOTAL	6,630,000	13,630,000	16,630,000	15,630,000	52,520,000
FINNIDA, total (FIM)	6,000,000	13,000,000	16,000,000	15,000,000	50,000,000
Zanzibar, calculated total (FIM)	188,000	509,000	953,000	868,000	2,518,000
Zanzibar, average (FIM)	630,000	630,000	630,000	630,000	2,520,000
Zanzibar, average (TAS)	31,500,000	31,500,000	31,500,000	31,500,000	126,000,000

Local component is calculated to be 10 % of total investment and procurement costs (marked by *)

A breakdown of the operational budget will be given in the work plan