THE UNITED REPUBLIC OF TANZANIA
THE REPUBLIC OF FINLAND

MTWARA-LINDI WATER MASTER PLAN

REVISION
Part: WATER SUPPLY

VOLUME 2
STUDIES

April 1986

FINNWATER
CONSULTING ENGINEERS
HELSINKI, FINLAND

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VOLUME 2 STUDIES

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ABBREVIATIONS AND ACRONYMS

AfDB	African Development Bank
AFYA	Ministry of Health
CCT	Christian Council of Tanzania
C.I.	Cast Iron
DED	District Executive Director
DP	Domestic Water Point (public tap)
DTH	Down-the-Hole Hammer (drilling rig)
DWE	District Water Engineer
EC	Electrical Conductivity
EEC	European Economic Community
FIM	Finnish Mark
FINNIDA	Finnish International Development Agency
FW	Finnwater Consulting Engineers
GDP	Gross Domestic Product
G.S.	Galvanized Steel
lcd	Litres per capita per day
MAJI	Ministry of Water, Land, Housing and Urban Development
ODA	Overseas Development Administration (United Kingdom)
O & M	Operation and Maintenance

PMO	Prime Minister's Office
Project	Mtwara-Lindi Rural Water Supply Project
PVC	Polyvinyl Chloride
RDD	Regional Development Director
RWE	Regional Water Engineer
TAS	Tanzanian Shilling
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
USD	United States Dollar
WMP-77	The Mtwara-Lindi Water Master Plan (1977)
WMPCU	Water Master Planning Coordination Unit

1 INTRODUCTION

The Mtwara-Lindi Water Master Plan Study was carried out in 1974-76 and a report was completed in 1977.

The need to update the WMP-77 has already been recognized for some time and this work was included in the Phase III Programme of the Mtwara-Lindi Rural Water Supply Development Project. The importance of the updating was emphazised during the evaluation of the Project at the beginning of 1984 and Terms of Reference for it were included in the evaluation report.

Due to the financial constraints it was agreed that the revised plan shall deal with the water supply sector only.

The objectives of the updating work were outlined in the evaluation report:

(a) To update the assessment of both groundwater and surface water resources.

(b) To assess the present level of water service and the relationship of this to the pre-Project level.

(c) To make a proposal for the future water supply development, taking into account following aspects:

- community involvement in Project activities,
- district focus (district and village councils),
- selection of suitable technologies,
- the current national economic situation,
- population growth since the 1978 census,
- any other local factor.

The work was started in June, 1984 and was carried out by the Finnwater organization which has been strengthened by experts specifically assigned to this work. Co-operation with the local MAJI organization has been close and staff were made available for this work, particularly for the village survey. Contacts with the Water Master Planning Co-ordination Unit and other authorities especially on the regional and district levels have been frequent.

The Draft Interim Report including the assessment of the present water supply situation, the water resources review, water demand estimates and the proposed planning criteria was presented in May, 1985. The report was discussed and commented upon in May-July, 1985.

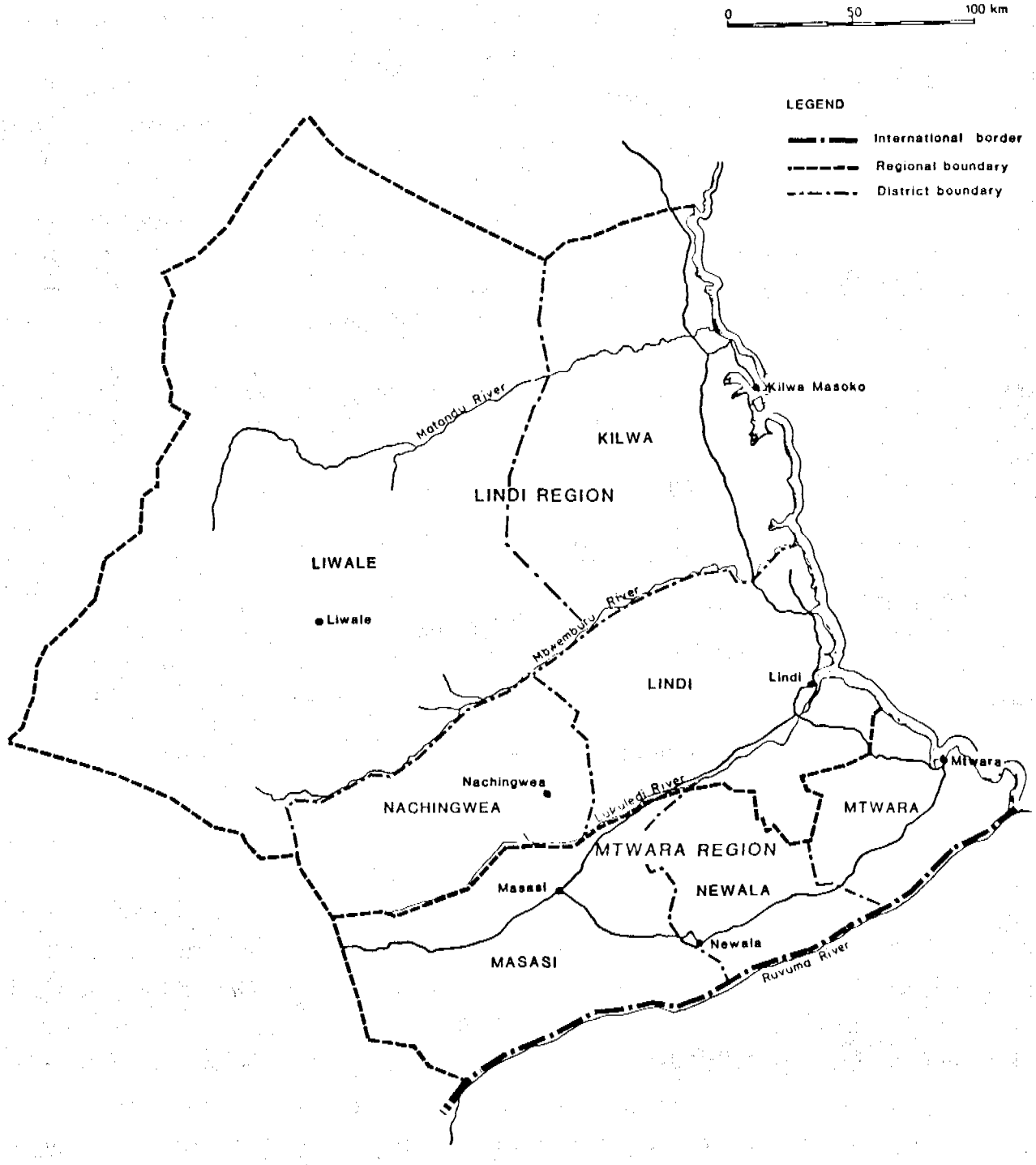
The Draft Water Supply Development Plan including presentation of water supply methods and their costs, alternative projects, and the actual water supply development plan, was completed in October, 1985. The report was discussed and commented upon in December, 1985.

This Final Report comprises three volumes:

Volume 1	Main Report
Volume 2	Studies
Volume 3	Maps

The area covered by the plan - Mtwara and Lindi Regions - is shown in Figure 1.

FIGURE 1 PLANNING AREA: MTWARA AND LINDI REGIONS



2
WATER SUPPLY INVESTIGATIONS

2.1 General

The aim of the investigations has been to establish a true picture of the prevailing water supply situation in different parts of the area. For that purpose following investigations have been carried out:

- village survey
- piped water supply schemes inspection

Information gathered in the field has been checked and compared with the data collected from MAJI Headquarters and regional and district offices and from other regional and district authorities. Records kept by Finnwater have also been used. Aerial photographs taken in 1981 were used when locating the villages and settlements were pinpointed in.

The water supply situation of the major urban settlements, Mtwara-Mikindani town and Lindi town were studied separately.

2.2 Village Survey

During the village survey, practically all of the 900 registered villages were visited. In addition, about 200 sub-villages were also surveyed. The total number of sub-villages and other rural settlements is not known since their official status is not always clear, but their number can be estimated at around 700 -800.

The survey was carried out between August 1984 and March 1985 by survey teams of 1 - 2 water supply technicians. The number of teams in the field varied from 1 to 3 at a time. During the survey, village officials were interviewed on the precise location, population, livestock, present water situation, future water supply, health, sanitation of the villages, village economy and willingness to participate in the water supply development. Water supply systems of the villages were also visited by the teams. The Questionnaire Form used in the survey can be seen in

Appendix 1. The data collected in the villages were checked and then processed by a computer. The format of the computer listing on which all that information is available, is reproduced in Appendix 2. The basic village data are presented in Appendix 3. Selected data are summarized in Appendix 4.

Based on the results of the survey and other studies, the maps included in WMP-77 showing the villages and administrative areas have been updated. They are shown on Drawings 2, 3 and 4, 1:250,000, of Volume 3.

Village survey can be considered fairly successful and the picture it gives on the water supply situation accurate, although mistakes can be found in the data of individual villages. Figures on population and livestock in particular, obtained from different sources, are often contradictory.

2.3 Piped Water Supply Schemes Inspection

All the existing 143 piped supply schemes were visited by a senior officer between August 1984 - February 1985. During the visit, the different parts of each scheme were inspected and evaluated and the need and usefulness of rehabilitation was assessed. The form used in the investigations is in shown Appendix 5. The important data of the rural water supplies are in Appendix 6. The locations of the water supplies are shown on Drawings 7, 8 and 9, 1:250,000, Volume 3.

There are a number of incomplete or fully abandoned piped water supply schemes in the area. Most of them were not included in the inspection. The same applies to those private water schemes which are of little public importance.

2.4 Water Supply Situation 1984

2.21 General Water Supply Situation

The water supply situation in the area can be described in terms of water supply systems used by the people and by the levels of service of these systems.

The use of different types of water systems as the main supply is summarized in Tables 1 and 2. The term "main water supply" represents the villagers' opinion as to which was their most important source of water at the time of the survey during the dry season 1984.

TABLE 1 Main Water Supply Systems; Mtwara Region

	Masasi	Mtwara	Newala	Mtwara Urban District	Mtwara R. Total
Population 1984	307,400	142,100	328,200	90,600	868,300
1. Piped W/S	34 %	27 %	54 %	85 %	46 %
2. Handpumps	27 %	33 %	4 %	15 %	18 %
3. Open well or pit	33 %	28 %	16 %	-	22 %
4. River	6 %	4 %	1 %	-	3 %
5. Dam	<1 %	5 %	<1 %	-	1 %
6. Spring	-	3 %	22 %	-	9 %
7. Rainwater	-		2 %	-	1 %

TABLE 2 Main Water Supply Systems; Lindi Region

	Kilwa	Lindi	Lindi Urban District	Liwale	Naching-wea	Lindi R. Total
Popul. 1984	130,500	260,000	36,600	49,900	117,400	594,400
1. Piped W/S	23 %	14 %	68 %	34 %	37 %	25 %
2. Handpump	39 %	46 %	-	26 %	30 %	37 %
3. Open well or pit	29 %	25 %	32 %	33 %	28 %	28 %
4. River	9 %	13 %	-	7 %	3 %	9 %
5. Dam	-	2 %	-	-	2 %	1 %
6. Spring	-	-	-	-	-	-
7. Rainwater	-	-	-	-	-	-

The distance to the nearest water abstraction point varies greatly and is normally longer to traditional water sources. The average distance to the main water supply is 1.8 km in Mtwara Region and 1.1 km in Lindi Region. The distribution of population at various distances from water is shown in Table 3.

TABLE 3 Distance to Main Supply

Distance	% of Population
0 - 0.5 km	66 %
0.6 - 1.0 km	4 %
1.1 - 2.0 km	10 %
2.1 - 5.0 km	8 %
> 5.0 km	12 %

Normally there are several water supply systems in the villages and their use often depends on the season and the purpose for which water is needed. Thus nearby seasonal water sources are used during the rainy season and more distant perennial water sources mainly during the dry season. Pits and surface water sources are used for livestock whereas piped water and handpump wells are mainly reserved for human consumption. The existence of different types of water systems and numbers of people using them are shown in Table 4.

TABLE 4 The Use of Different Types of Water Supplies

	Mtwara Region		Lindi Region	
1. Piped W/S	576,200	66 %	320,200	76 %
2. Handpump	311,600	26 %	234,600	39 %
3. Open well or pit	490,500	56 %	393,600	66 %
4. River	102,800	12 %	90,400	15 %
5. Dam	61,200	7 %	7,800	1 %
6. Spring	92,100	11 %	4,000	1 %
7. Rainwater collect	204,200	24 %	-	0 %

Rainwater is collected only in Makonde Plateau in Newala District, where 42 % of the population have rainwater collection systems in their villages. Water is normally collected from the surface into 5 - 15 m^3 chambers dug into the ground. The chambers are usually lined with cement, fenced but covered only with tree brances or loose iron sheets. The systems are normally individually owned and maintained. Water quality in the chambers is usually very poor. The rainwater collection systems supply water during the rainy season and 2 - 3 months after it. In villages which have been served by Kitangari W/S, most rainwater systems have been abandoned. Their upkeep should be encouraged, however, as useful stand-by systems during break-downs.

The coverage of the different types of water systems is not a sufficient index to give an accurate picture of the actual situation of water supply. Some sources are seasonal, and quite often improved water systems, especially piped water schemes, do not function. In order to describe the situation a "service level" criterion has been developed. It measures the improvement of the water supply situation and the functioning of the improved systems. Four different categories have been used:

0: **No service.** No improved water systems (piped W/S or hand pump) constructed.

1: **No real service.** Improved W/S constructed but not functioning.

2: **Limited service.** Improved W/S constructed but operation, capacity or water quality unsatisfactory.

3: **Full service.** Improved W/S functioning according to design criteria.

The water supply service level in each village is listed in Appendix 3 where also the detailed description of each category appears. Piped W/S and handpumps are first considered separately and the higher category of these two determines the service level in the village. Table 5 shows the service levels in the regions and districts.

TABLE 5 **Water Supply Service Level**

	Population 1984	Service level 0	1	2	3
Masasi	307,400	29 %	15 %	33 %	23 %
Mtwara	142,100	20 %	15 %	35 %	30 %
Newala	328,200	16 %	28 %	16 %	40 %
Mtwara-Mikindani	90,600	-	5 %	89 %	6 %
Mtwara Region Total	**868,300**	**19 %**	**19 %**	**33 %**	**29 %**
Kilwa	130,500	31 %	10 %	31 %	28 %
Lindi	260,000	22 %	21 %	29 %	28 %
Liwale	49,900	29 %	19 %	38 %	14 %
Nachingwea	117,400	15 %	28 %	35 %	22 %
Lindi Urban	36,600	-	-	100 %	-
Lindi Region Total	**594,400**	**22 %**	**18 %**	**36 %**	**24 %**
AREA TOTAL	**1,462,700**	**20 %**	**19 %**	**34 %**	**27 %**

The above service level classification emphasizes improved water supplies, i.e. piped W/S and handpumps. It seems, however, that the villagers' present idea of a good water supply does not necessarily imply improved water supply. Reasonable distance, sufficiency and reliability of the water supply and reasonable quality in combination with good taste are the most important requirements.

People's opinions are demonstrated by complaints collected during the village survey (Table 6).

TABLE 6 **Main Complaints on the Water Supply Situation**

Complaint	No. of villages
1. Amount of water not sufficient	783
2. Water dirty	345
3. Water too far	275
4. Operation of W/S unreliable	258
5. Water salty	20

2.42 Piped Water Supply Schemes

The coverage of the piped water schemes, i.e. the number of people within the service areas of the schemes, is presented in Table 7. It should be noted that this table does not take into consideration the level of service the schemes are giving.

TABLE 7 Piped W/S Coverage

	Total population 1984	No. of schemes	Piped schemes coverage population	%
Masasi	307,400	26	147,500	48 %
Mtwara	142,100	18	75,700	53 %
Newala	328,200	6	252,800	77 %
Mtwara-Mikindani	90,600	2	58,000	64 %
Mtwara Region Total	**868,300**	**52**	**534,000**	**62 %**
Kilwa	130,500	18	49,700	38 %
Lindi Rural	260,000	31	118,200	45 %
Liwale	49,900	15	28,700	57 %
Nachingwea	117,400	26	84,600	72 %
Lindi Urban	36,600	1	36,600	100 %
Lindi Region Total	**594,400**	**91**	**317,800**	**53 %**
AREA TOTAL	**1,462,700**	**143**	**851,800**	**53 %**

Although 58 % of the population is living in the service areas of piped water supply schemes, only 37 % consider the piped W/S as their main source of water. (See Tables 1 and 2)

The most common source of piped water supply is a borehole and only 13 out of the 143 schemes use surface water. The sources of the water supplies are presented in Table 8.

TABLE 8 Sources of Piped Water Supplies

	Mtwara Region no. of schemes	popul.	Lindi Region no. of schemes	popul.
Borehole	30	291,200	36	123,000
Well	8	25,400	33	73,000
Spring	12	201,900	11	82,900
Stream	0	0	6	29,700
Dam	2	16,500	5	9,200
	52	**534,000**	**91**	**317,800**

Water quality is mainly good (66 % of the population served). Polluted sources are still rather common. Salinity is a problem in 24 schemes.

The yields of the sources and the capacities of the schemes were difficult to establish. About one third of the schemes are estimated to have insufficient yield or pumping capacity.

The most common source of power of the schemes is the diesel engine. Only 9 schemes are operated fully or mainly by gravity and 8 schemes are electrified. Even in those, diesel engines are commonly used as stand-by or supplementary sources of power.

The functioning of the schemes is evaluated in Table 9.

TABLE 9 Operation of Piped W/S

	Total schemes		Operating >50% of time		Operational but operating <50% of time		Non-operational	
	nos	popul.	nos	popul.	nos	popul.	nos	popul.
Masasi	26	147,500	9	39,800	6	19,000	11	28,700
Mtwara	18	75,700	2	23,000	6	18,400	10	34,300
Newala	6	252,800	2	135,800	2	41,400	2	75,600
Mtwara-Mikindani	2	58,000	2	58,000	0	0	0	0
Mtwara Region	**52**	**534,000**	**15**	**316,600**	**14**	**78,800**	**23**	**138,600**
				59 %		**15 %**		**26 %**
Kilwa	18	49,700	5	22,400	4	12,200	9	15,100
Lindi	31	118,200	6	41,100	8	31,200	17	45,900
Liwale	15	28,700	1	11,000	4	4,700	10	13,000
Nachingwea	26	84,600	1	12,100	13	25,100	112	47,400
Lindi Town	1	36,600	1	36,600	0	0	0	0
Lindi Region	**91**	**317,800**	**14**	**123,200**	**29**	**73,200**	**48**	**121,400**
				39 %		**23 %**		**38 %**
AREA TOTAL	**143**	**851,000**	**29**	**439,800**	**43**	**152,000**	**71**	**260,000**
				52 %		**18 %**		**30 %**

The operational status of the schemes varies from excellent to very poor, several schemes having stayed out of operation for several years. Gravity schemes and those located in major centres are performing better than the rest. The same applies to the schemes constructed by the Project and thus getting special assistance in their operation.

Where 52 % of the population within the service areas of all piped schemes are getting reasonable service (> 50 % of the time), the figure with the urban schemes is 76 %, and 42 % with the rural schemes. Of those rural schemes which are supported by the Project, 86 % are working more than 50 % of the time whereas the corresponding figure with the rest of the rural schemes is as low as 25 %, practically all them gravity schemes.

The difference between Mtwara Region and Lindi Region in the coverage of well operating schemes is caused by Kitangari W/S, which serves 120,000 people and operates continuously.

The most important reasons for the poor operation are the lack of fuel and spare parts. Poor standard of operation also seems to be a common problem. The poor quality (salinity or bad taste) or insufficient yield of the source seem to lead to operational problems in some cases, particularly in the Basement area and in the Coastal strip.

If the present difficult situation with regard to and spare parts could be solved, a reasonable water supply service could be offered to about 150,000 more people.

3

SURFACE WATER RESOURCES REVIEW

3.1 General

The run-off in an area depends mainly on the precipitation, its seasonal distribution and evaporation conditions. These vary considerably as to both the total yield and seasonal distribution. Observations over several years are needed, in order to establish a reliable picture of the mean value and fluctuations of the run-off.

The observations of WMP-77 were based on the data available at that time. Especially the records on river flows covered very short periods since most of the recording stations as late as in the early 1970's. The additional data of 1976-84 improve the reliability of the observations although closures and non-functioning of the stations have been frequent.

3.2 Meteorology

The most important climatological statistics of Mtwara and Lindi Regions are presented in Table 10.

TABLE 10 **Climatological Statistics in Mtwara and Lindi Regions**

Station and period	Temperatures									Relative Humidity		Average Wind Speed		Atmospheric Pressure	
	Max+Min /2 °C	Mean Max °C	Mean Min °C	Extremes Max °C	Extremes Min °C	Dry Bulb 0600 °C	Dry Bulb 1200 °C	Dew Point 0600 °C	Dew Point 1200 °C	0300 %	1200 %	0600 knots	1200 knots	0600 mb.	1200 mb.
Lindi 1935-55	26.1	30.5	21.7	36.2	12.3	24.9	29.0	21.7	22.0	93	67	5	9	1010.8	1007.8
Mtwara 1957-70	25.7	30.2	21.1	35.1	14.7	25.4	28.7	21.9	21.4	94	66	9	11	1002.2	999.4
Nachingwea 1951-70	24.5	30.2	18.7	38.5	7.7	23.3	28.8	19.2	17.9	77	53	6	6	-	-
Liwale 1969-76	25.3	29.4 (1971-72)	21.2	-	-	-	-	19.2 (69-72)		78.2 (70-72)		km/day 86.1 (71-72)		-	-
Kilwa Kivinje 1972-75	27.0	30.0 (1972-75)	24.0	-	-	-	-	21.4 (72-75)		77.9 (72-75)		179.8 (72-75)		-	-

3.3 Precipitation

The mean annual precipitation of the area is relatively even varying from 1,200 mm to 800 mm. Annual variations, on the contrary, are rather large. Precipitation rises up to 2,000 mm once in twenty years on the average. On the other hand, an annual precipitation of 500 mm occurs once in twenty years. Variations between individual stations are even greater. The highest annual precipitation reading registered in the area was over 2,700 mm in a year and the lowest below 200 mm.

There are, according to the records of the Meteorological Department and Maji, 96 precipitation recording stations in the area, 48 in both regions. The list of the stations, their locations, years of operation and mean annual rainfall are listed in Appendix 7. It can be seen that only about half of the stations have operated for more than 5 full years. The data are often incomprehensive with a number of months missing, and several stations are non-operational. The situation with the precipitation recording can be considered unsatisfactory, especially in the northern and western parts of the area.

The mean annual precipitation map is presented in Figure 2.

The average precipitation during the period 1976-1983 does not differ much from that of the period 1931-1976 and can be considered as normal although regional variations occur. The individual years vary more. The precipitations of the rainy seasons at 18 stations during the period 1976-1983 are shown in Figures 3 and 4 and in Appendix 8. It can be clearly seen that the rainy season 1980-1981 was below the average at all stations and in most cases represents a dry period occuring only once in 10-50 years. The effect of that dry season was strengthened by the season 1981-1982, which also was slightly below normal.

3.4 Hydrometry

3.41 General

There are five large rivers in the project area flowing into the Indian Ocean . The rivers are the Matandu, the Mavuji, the Mbwenkuru, the Lukuledi and the Ruvuma. The basins of the four first mentioned rivers vary in size from 3,000 to 15,000 km^2 which shows that they are rather large water courses. In spite of the large

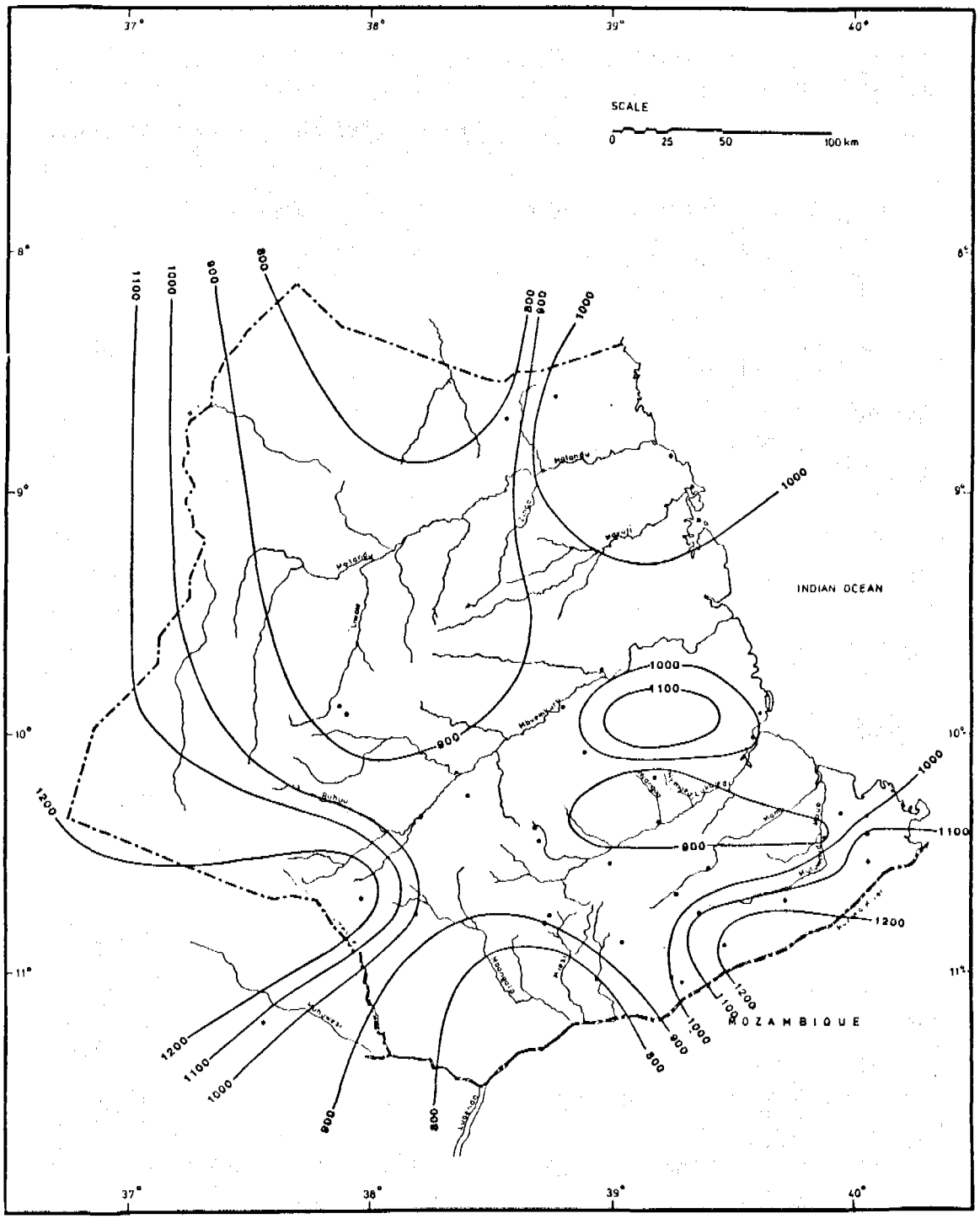


FIGURE 2 **Mean Annual Precipitation 1936-1983**

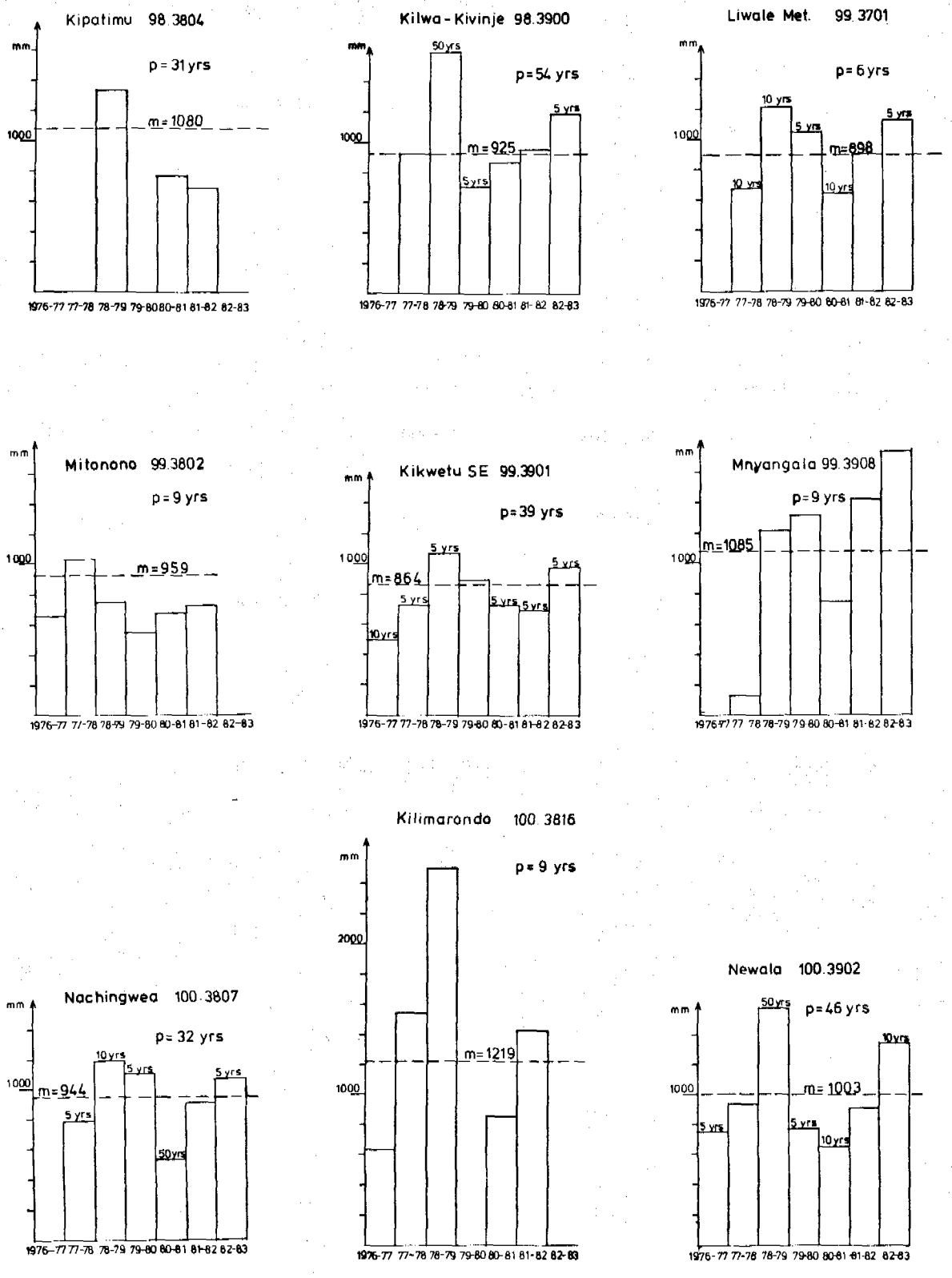


FIGURE 3 **Precipitation during the Rainy Seasons 1976-1983**

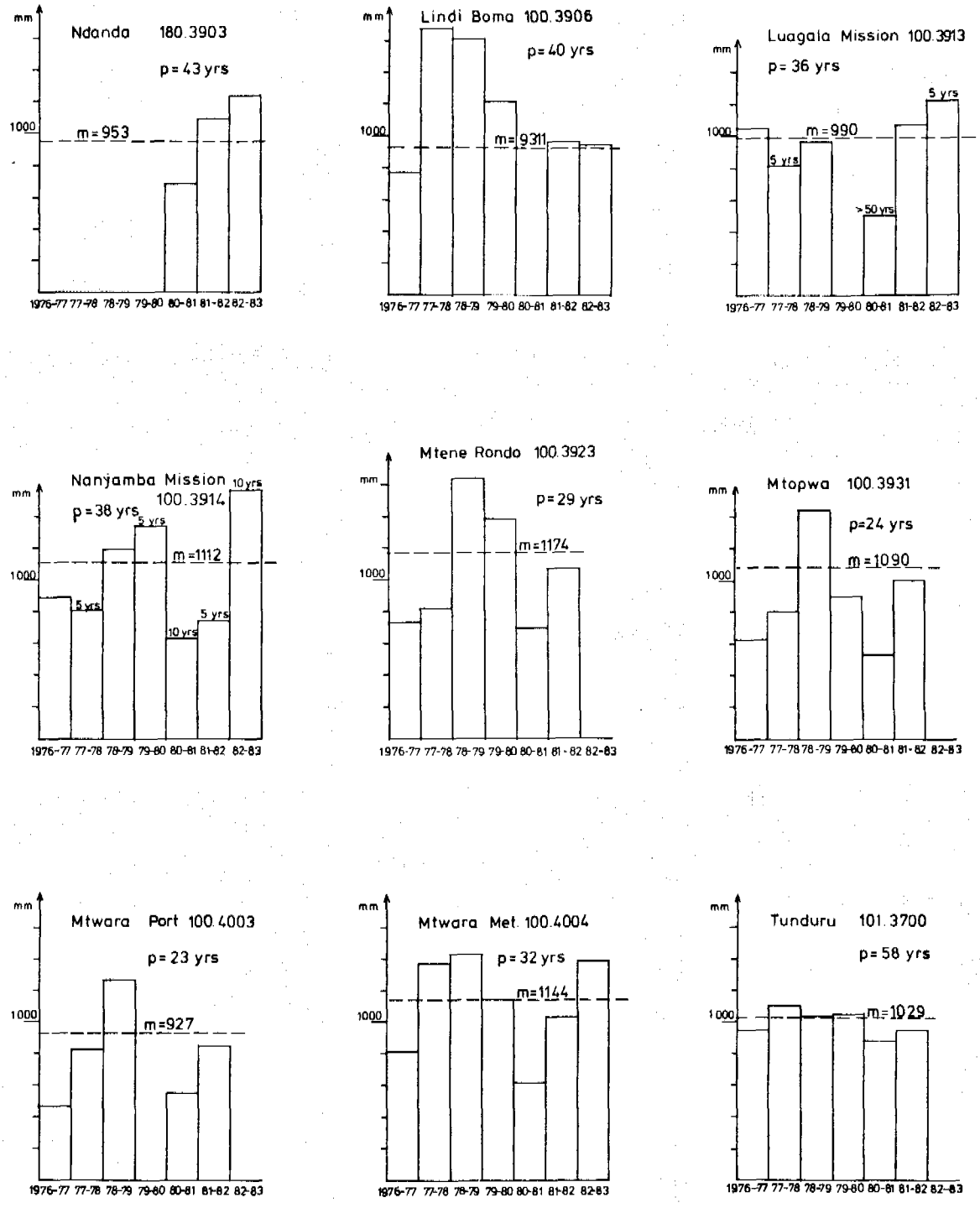


FIGURE 4 **Precipitation during the Rainy Seasons 1976-1983**

basins, the rivers dry up regularly for most parts every year. Only some minor tributaries, mainly originating from springs on the slopes of the plateaus, cause perennial flow in the actual tributaries and in the lower courses of some main rivers.

There are five rather small lakes in the area which carry water all the year round, i.e. Lake Chidya, Lake Kitere, Lake Rutamba, Lake Mkoe and Lake Maliwe. The lake areas vary with the season. The total lake area is estimated at 18 km^2 only.

3.42 Network

The present hydrometric network in Mtwara and Lindi Regions consists of 12 stations. With one exception all stations are equipped with staff gauges, nine stations have a recorder, although none of them is operating, and 11 stations are equipped with a cable way, of which only three are operational. The stations are shown in Figure 5 and in Tables 11 and 12.

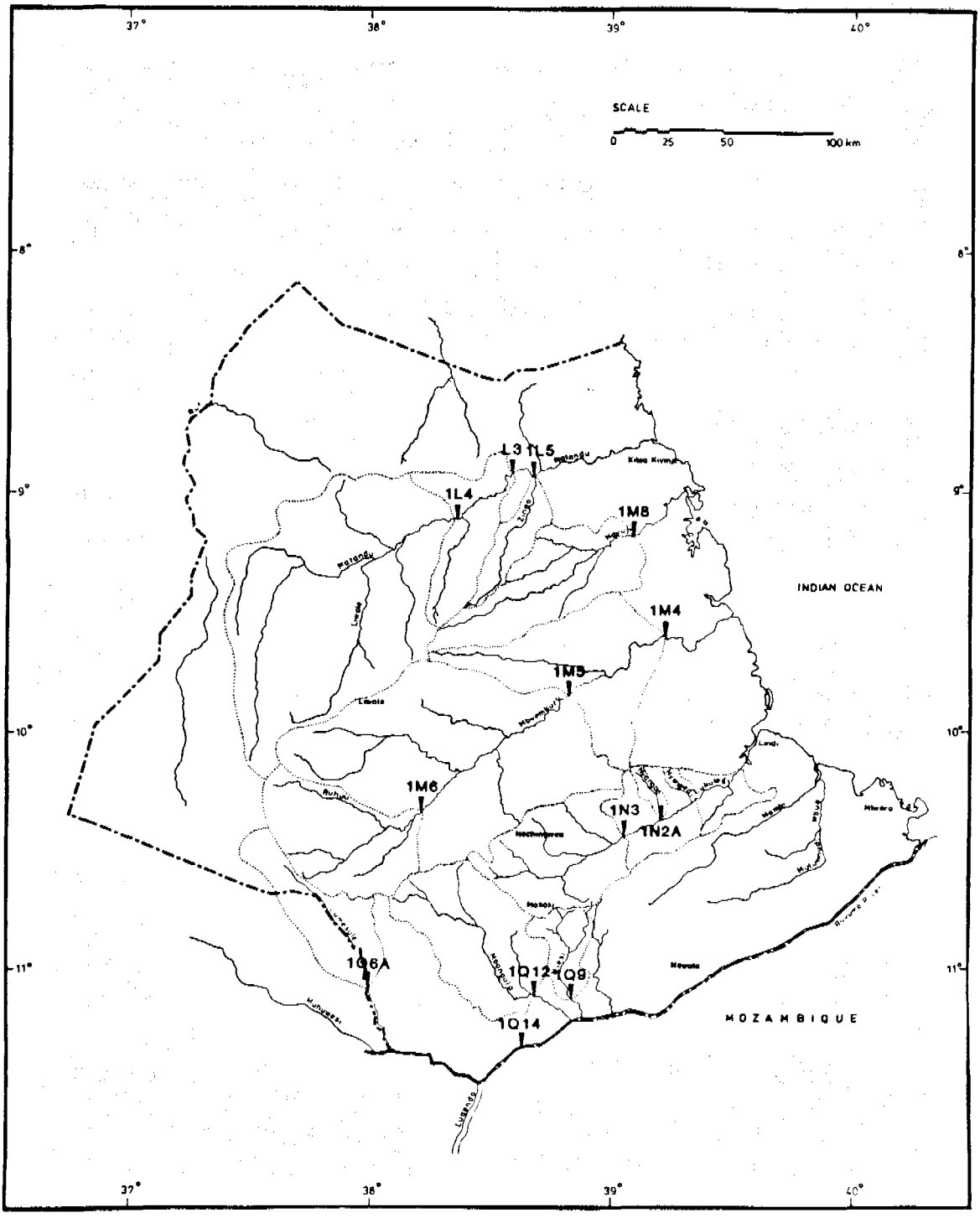


FIGURE 5 **Hydrometric Stations**

TABLE 11 Hydrometric Stations

River	Station	Catch-ment area km^2	Staff gauge	Cable-way	Rec-order	Comments
Matandu	Mtanga 1.L.3	11,260	yes	yes	no	No cable, sand deposits, not gauged
Matandu	Kibumburukutu 1.L.4	9,550	yes	no	no	Closed Sept. 1976
Zinga	Miguruwe 1.L.5	830	yes	yes	yes	Recorder not operating
Mbwemkuru	Mnyangala 1.M.4	15,220	yes	yes	no	Place not suitable. Closed 17.11.1980
Mbwemkuru	Mitonono 1.M.5	11,700	yes	yes	yes	
Mbwemkuru	Singira 1.M.6	3,010	yes	yes	yes	No cable
Mavuji	Mbiliwia 1.M.8	2,930	yes	no	no	
Nyangao	Nyangao 1.N.2.A	200	yes	no	yes	
Lukuledi	Nanganga 1.N.3.A	2,710	yes	no	yes	
Lukuledi	Mtua 1.N.4	4,170	yes	yes	yes	Station destroyed. Closed 14.3.1983
Lumesule	Rwanda 1.Q.6	1,430	yes	no	no	
Miesi	Mikele 1.Q.9	800	yes	no	no	
Mbangala	Mahinyo Hills 1.Q.12	3,230	yes	no	no	
Ruvuma	Lukwamba 1.Q.14	83,000	no	no	no	Spot gaugings

TABLE 12 Periods of Hydrometric Records

RIVER	STATION	CATCHMENT AREA km²	YEARS -68 -69 -70 -71 -72 -73 -74 -75 -76 -77 -78 -79 -80 -81 -82 -83
MATANDU	MTANGA 1.L.3	11250	
MATANDU	KIBUMBURUKUTU 1.L.4	9550	Closed
ZINGA	MIGURUWE 1.L.5.	830	
MBWEMKURU	MNYANGALA 1.M.4.	15220	Closed
MBWEMKURU	MITONONO 1.M.5.	11700	
MBWEMKURU	SINGIRA 1.M.6.	3010	
MAVUJI	MBILIWIA 1.M.8.	2930	
NYANGAO	NYANGAO 1.N.2.A	200	
LUKULEDI	NANGANGA 1.N.3.	2710	
LUKULEDI	MTUA 1.N.4.	4170	Closed
LUMESULE	RUANDA 1.0.6.A	1430	
MIESI	MIKELE 1.0.9.	800	
MBANGALA	MAHINYO HILLS 1.0.12	3230	
RUVUMA	LUKWAMBA	83000	

WATER LEVEL DATA AVAILABLE
DISCHARGE DATA AVAILABLE
WATER LEVEL RECORDER IN USE

3.43 Flow Records

The gaugings establishing and checking the rating curves have been relatively infrequent. Taking into consideration that changes occur in the river cross sections at several stations, the frequency of the gaugings is not sufficient. Using the available water level data and gaugings and the rating curves presented in WMP-77, the monthly averages and the monthly maximum and minimum flows at each station have been calculated. They are presented in Appendix 9.

Comparing the river flows in 1968-76 with the new records in 1977-83, no drastic changes are to be made. The mean discharges and the run off figures presented in WMP-77 are still basically valid. Few changes in the minimum flows have been observed and they are presented in Table 13.

TABLE 13 Recorded Minimum Flows 1968-83

River	Station		Recorded Minimum Flow m^3/s
Matandu	1.L.3	Mtanga	0.0
Matandu	1.L.4	Kibumburukutu	0.0
Zinga	1.L.5	Miguruwe	0.0
Mbwemkuru	1.M.4	Mnyangala	0.0
Mbwemkuru	1.M.6	Singira	0.0
Mavuji	1.M.8	Mbiliwia	0.28
Nyangao	1.N.2A	Nyangao	0.16
Lukuledi	1.N.3	Nanganga	0.0
Lukuledi	1.N.4	Mtua	0.34
Lumesule	1.Q.6	Rwanda	0.0
Miesi	1.Q.9	Mikele	0.0
Mbangala	1.Q.12	Mahinyo	0.0
Ruvuma	1.Q.14	Rukwamba	N/A

3.5 Surface Water Resources

The surface water data collected during 1977-83 is incomprehensive and additional information in it is limited. It supports the conclusions of the earlier WMP-77.

The potential surface water resources of the different river basins are shown in Table 14. The run-off values are based on the results of the earlier report corrected in view of the recent data. The figures represent the minimum run-offs occuring once in five to ten years.

TABLE 14 Annual Surface Water Resources

River Basin	Catchment Area assessed km^2	Annual Net Run Off	
		mm	10^3 m^3/day
Matandu	11,700	3.7	119.3
Mavuji	2,900	3.3	26.0
Mbwemkuru	11,600	7.6	240.0
Lukuledi	4,200	3.0	34.5
Lindi Region Total	**30,200**	**5.1**	**419.8**
Mwiti	900	2.8	6.8
Miesi	520	2.8	6.8
Mbangala	3,200	9.9	87.1
Lukwimba	370	12.0	12.2
Lumesule	1,880	12.8	65.5
Mtwara Region Total	**6,870**	**9.8**	**177.4**
Ruvuma River			2,500.0

The present source of water supplies in Mtwara and Lindi Regions is almost entirely groundwater. The same trend appears to continue. As a source of water supplies, therefore surface water is of limited importance. In some areas, however, the use of surface water may become important. Big towns, Mtwara, Lindi, Masasi, Liwale and Kilwa-Masoko with upcoming industry are likely to use surface water in the future.

Although the water supply for livestock, in most cases, is arranged together with the domestic water supply, the incresing number of livestock represents in some areas, especially in Masasi, a special water demand which can be separately satisfied with surface water. Small dams can be constructed by local means and they can, if properly located, designed and constructed, supply low quality surface water for livestock. Water in a dam, however, is not suitable for human consumption without treatment. One method of arranging a domestic water supply at a dam is constructing hand pump wells on the sides of the dam and arranging permeable but sufficiently long connections between the dam and the wells.

In areas where no ground or surface water is available, such as Makonde Plateau, Rondo Plateau and along the coast, rainwater collection can be used as an addition or alternative to other types of water supplies.

Considering the above observations together with the possible future irrigation projects, it is important to continue collecting data on precipitation and river flows. The present deteriorating networks should be rehabilitated and the reliability and continuity of the readings and record collection should be improved.

4
GROUNDWATER

4.1 General Hydrogeological Conditions

The geological formations of the area comprise rocks from the Pre-Cambrian age up to recent times.

Hydrogeologically, the area can be divided into four zones shown in Table 15. The locations of the zones are indicated in Drawing 5, 1:750,000 in Volume 3.

TABLE 15 **Hydrogeological Zones**

		Abbreviation used in this context
1.	Tertiary - Quaternary beds in coastal area	Coast
2.	Mesozoic beds between coastal strip and Basement	Plateau
3.	Crystalline basement rocks in Masasi and Nachingwea Districts	Basement
4.	Karroo, mainly sandstones in western parts of Liwale District	Karroo

The narrow and relatively flat Coast-zone and the wider and more uneven Plateau-zone are both largely composed of fairly permeable sand and laterite layers, which generally form good groundwater infiltration areas.

The hard crystalline rock in the Basement-zone, apart from some bedrock outcrops, is covered with relatively thin lateritic soil material, mostly products of in situ weathering. The occurance of groundwater is generally poor, the best aquifers being found in the faults and in the porous weathered mantle covering the fresh rock.

The Karroo sediments comprise mainly sandstones, the other main rock types being limestone, mudstone, claystone and conglomerate. The hydrogeology of Karroo is not well known, but the general groundwater potential is assumed to be good.

4.2 Hydrogeological Data 1976-1984

4.21 General

After the completion of the Water Master Plan Study in 1976, additional information on ground-water conditions in Mtwara and Lindi Regions has been accumulated during the planning, construction and operation of the boreholes and shallow wells. The information collected during the actual implementation of the water supplies and no special surveys or observations on the groundwater situation were carried out during the period.

In general, the recent data supports the conclusions of WMP-77. Nevertheless, the Basement-zone in Masasi as well as some coastal areas, such as Pande, have proved more difficult than estimated from the groundwater point of view.

4.22 Shallow Groundwater

During the period 1976-1984, altogether 1,817 handpump wells were constructed. The list of the wells by districts is in Table 16. The well construction areas are marked in Drawing 5 of Volume 3.

TABLE 16 **Handpump Wells constructed 1976-1984**

District	Ring wells	Tube wells	Handpump wells Total	Abandoned
Masasi	416	68	484	14
Mtwara	173	143	316	23
Newala	4	35	39	7
Kilwa	190	21	211	2
Lindi	318	169	487	10
Liwale	60	5	55	-
Nachingwea	169	9	178	2
Total	**1,330**	**450**	**1,780**	**58**

The method of construction of the dug wells mainly by excavators has limited the depth to 5 metres. Therefore, the average depth of dug wells is around 3.5 m only. The average depth of hand auger wells is about 10 m.

During regular maintenance of the wells, normally four times a year, the water levels were observed. The observations covering the period 1.7.1982-30.6.1984 demonstrate the reliability of the wells (Table 17). The differences between the districts are shown in Table 18.

TABLE 17 **Water Availability in Handpump Wells**

Period	Season	Hand-pumps visited	Water Availability		
			Sufficient %	Insufficient %	Dry %
7/82-9/82	Early Dry	1,044	48	30	22
10/82-12/82	Late Dry	968	39	43	18
1/83-3/83	Early Wet	937	83	14	3
4/83-6/83	Late Wet	992	87	12	1
7/83-9/83	Early Dry	1,049	69	20	11
10/83-12/83	Late Dry	1,201	62	17	21
1/84-3/84	Early Wet	439	93	5	2
4/84-6/84	Late Wet	612	91	9	-

TABLE 18 **Reliability of Wells in 1983**
Dry Season

	No. of Wells	Sufficient	Insufficient	Dry
Masasi	318	32 %	18 %	50 %
Mtwara	252	61 %	23 %	16 %
Newala	34	71 %	29 %	Nil
Kilwa	126	69 %	19 %	20 %
Lindi	259	83 %	12 %	5 %
Liwale	74	69 %	14 %	17 %
Nachingwea	138	93 %	6 %	1 %
Total	**1,201**	**62 %**	**17 %**	**21 %**

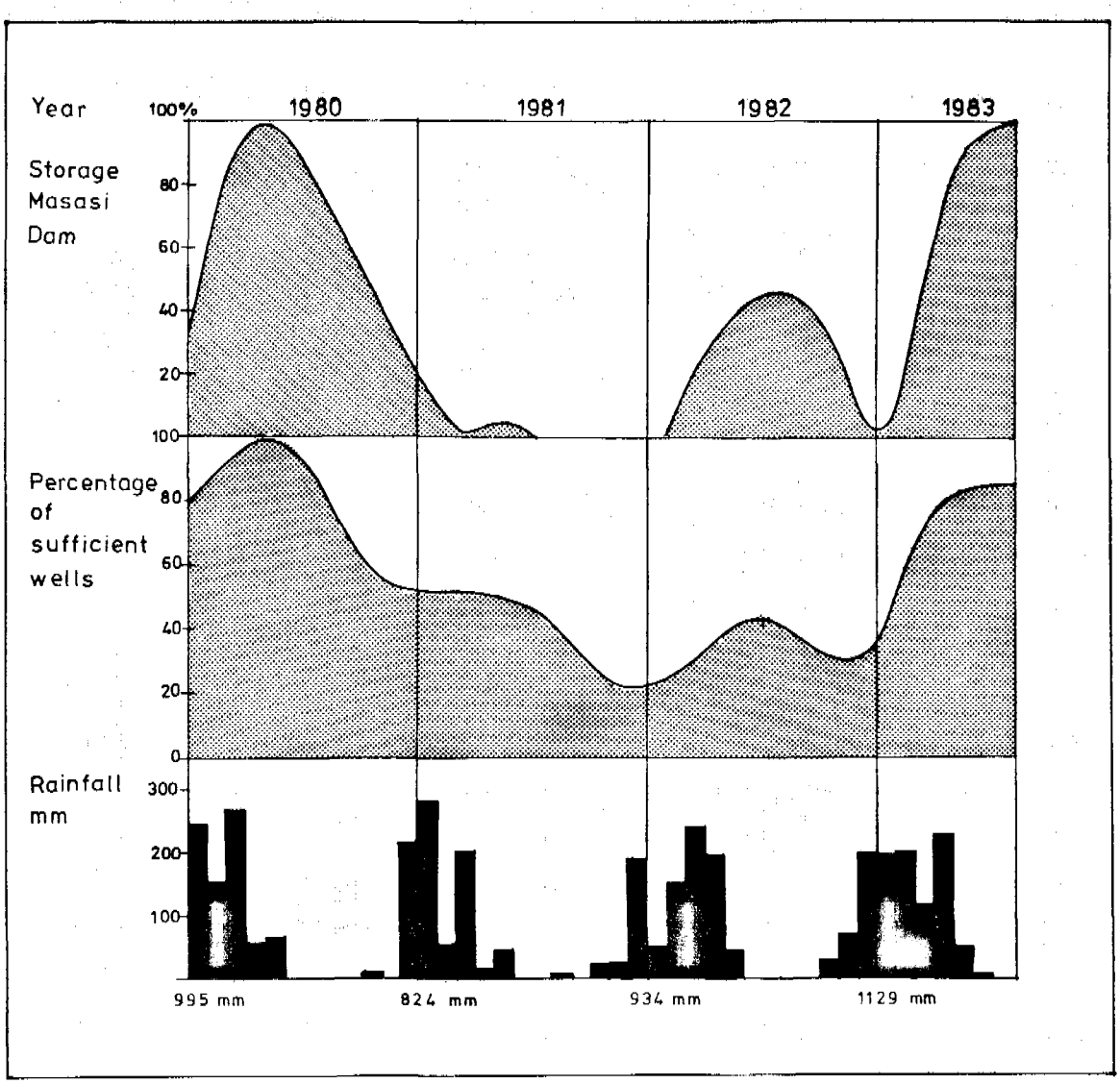
Rainfall in 1983 was relatively normal but ground water levels were still affected by the exceptionally dry period 1981-82. The rainy season 1983-84 was normal or above normal. Dug wells, which normally have been constructed in poorer aquifers, dry easier than hand auger wells. By the end of the 1983 dry season, 53 % of the dug wells were sufficient whereas the corresponding figure of the hand auger wells was 75 %.

The large fluctuations of the water table was the most important reason for the unreliability of the wells.

The fluctuation comes from the perched water sources utilized by the majority of the hand pump wells both in sedimentary and in basement areas. In the Basement, the small perched water aquifers lie at the depth of 1.5...3.5 m. Underneath there are normally about 20 m thick impermeable clayey formations above the porous weathered zone of the basement rock. Because of the limited storage capacity of the upper aquifer, many of the wells dry up or have insufficient yields during dry seasons. The deepening of wells is normally also useless as the next aquifer, if it exists, is too far down for dug wells.

The importance of the rainfall and its pattern in the Basement is demonstrated by the situation in Masasi during the period 1981-84. The Masasi dam, with a capacity of 110,000 m^3 and a catchment area of about 20 km^2, relies entirely on surface water flow. The 40 handpump wells located partly in the same basin rely on the shallow groundwater, in most cases perched water, which has limited storage capacity. Figure 6 demonstrates the changes in the amount of water in the dam, the number of dry wells and the rainfall. The relationship is clear, and it can be observed that insufficient rainfall during exceptionally dry years neither produces surface runoff nor causes any significant ground water infiltration.

FIGURE 6 **Dam Storage, Shallow Wells and Precipitation in Masasi 1980 - 1983**



In Coast and Plateau there are large groundwater aquifers where ground water table follows the topography of the earth's surface only in few cases. The gradient of that water table, as well, is small and the annual fluctuation very limited.

The Plateau and river sediments above the groundwater table form a sandwich structure where the permeability of soil the varies from good to very poor. Therefore, quite rich perched water aquifers close to the ground surface can be found in many areas during and after the rainy season and perennial or seasonal wells can be constructed. The bulk of the wells, e.g. in Mtwara District, make use of this type of aquifer.

In many cases the slow downwards infiltration of perched water continues and will lead to the sinking of the water table with several metres (up to 4...8 m) and the drying up of dug wells. A typical example is Ziwani village located at about 10 km SW from Mtwara town at roughly 31 m above the sea level. There is a high yield borehole there (No. 86/76) with a static water level at 28.6 m below the ground level and an annual fluctuation only a few centimetres. In the same area there are 7 dug handpump wells about 5 m deep. During a normal year three of the wells have been perennial and others have had enough water for about 8 months. In 1982 all the wells dried up.

To solve the problem of the dry and insufficient wells, altogether 300 wells have been deepened since 1980. Although no reliable data on the results exist, experience has not been encouraging and generally only limited improvement has been achieved.

Chemical water quality data for the different types of wells according to hydrogeological zones are presented in Appendix 10. Although the records are not very representative, it can be concluded that salinity seems to be the most important problem. Otherwise well water is normally of acceptable quality.

4.23 Deep Groundwater

After 1976, altogether 115 boreholes have been drilled, 43 of these have been completed as production wells with motorized pumps and 15 equipped with handpumps. The boreholes are listed in Table 19.

TABLE 19 **Boreholes drilled in 1976-84**

	Total	Production	Handpump	Test holes
Coast	16	12	2	2
Plateau	30	20	2	8
Basement	69	15	15	39
Karroo	-	-	-	-

65 of the boreholes were drilled by rotary drills, 37 by down-the-hole hammer drills and 13 by percussion drills. Most of the test holes were drilled during the present hammer-drill programme in the Basement area.

Locations of the boreholes have been marked in Drawing 5 of Volume 3. The data on the boreholes are given in Appendix 11.

Yield figures of 66 boreholes are available. Distribution of the borehole yields in different zones is presented in Table 20, which also includes the information on the 110 boreholes drilled in 1974-76.

TABLE 20 **Yield of the Boreholes**

Yield	Coast		Plateau		Basement	
0 - 50 m^3/d	14	22.6 %	3	8.8 %	15	18.8 %
51 - 100 "	7	11.3 %	1	2.9 %	12	15.0 %
101 - 200 "	11	17.7 %	6	17.6 %	25	31.2 %
201 - 400 "	19	30.6 %	4	11.8 %	25	31.2 %
401 - 800 "	6	9.7 %	3	8.9 %	3	3.8 %
> 800 "	5	8.1 %	17	50.0 %	-	-
Total	**62**	**100 %**	**34**	**100 %**	**80**	**100 %**

The available water quality data are presented in Appendix 11 and have also been summarized in Appendix 10.

4.3 Basement Study

After the difficulties of the ground water development in Basement had been realized, a down-the-hole hammer drill specially suitable for hard rocks was made available in 1984. The task of the new drilling machine was to further explore the possibilities of finding acceptable ground water in the basement area with a particular attention to the weathered zone on top of the solid rock.

In connection with the new drilling machine, it was decided to carry out a more detailed hydrogeological study in the Basement area utilizing the results of the drilling. In the study, special emphasis was placed on the water supplies for Nachingwea and Masasi town. The Study was carried out at the end of 1984 and the report is attached to this report as Appendix 12.

The principal observations of the study can be summarized as follows:

1. The capacity of the Nachingwea water supply can be improved by increasing abstraction in the well fields of Mkumba Shamba and Mkumba Pacha. The safe yields of Mkumpa Shamba and Mkumba Pacha are estimated at 1,500 m^3/d and 500 m^3/d respectively. Developing and extending the well fields there may be possibilities of increasing the abstraction even further.

2. The safe yield of Magumchila well field, which is one of the two main sources of Masasi Water Supply, is confirmed as 1,000 m^3/d, which also is the earlier design capacity. The possibilities of finding other considerable groundwater sources in the area are limited.

3. Shallow groundwater potential is generally poor since aquifers near the surface are nearly always perched water and of limited capacity. Wells dug in these aquifers are liable to dry up during dry seasons.

4. The deep groundwater potential of the Basement is poor, especially in Masasi where the baserock is covered by thick impermeable clays. High yielding aquifers can be found in major faults but they seem to be saline nearly without exceptions. Sufficient amounts of water for handpumps appear to be available on higher grounds where the mobility of groundwater is greater than in valleys and its quality still fresh. Water is normally found in the weathered zone of the basement rock at a depth of 10-40 m.

5. The down-the-hole hammer drill seems to be suitable for groundwater exploration in the Basement area and in developing medium depth boreholes for hand pumps.

4.4 Groundwater Potential

4.41 General

Potential of groundwater as a source of domestic water supply has been estimated based both on the investigations carried out during the preparation of WMP-77 and on the data accumulated after the completion of the study in 1976. Estimating the potential, quantity and quality and the accessiability have been considered. Shallow groundwater potential is shown in Figure 7 and, in more detail, in Drawing 6, where four different categories are indicated. Generally, the potential is reasonably good although large difficult areas exist, such as Makonde and Rondo Plateaus and most of the Basement. Deep groundwater potential follows quite well the shallow groundwater potential, although high yielding aquifers are usually only found in rather limited ares. A more detailed description of the groundwater potential is given below for the different districts.

4.42 Masasi District

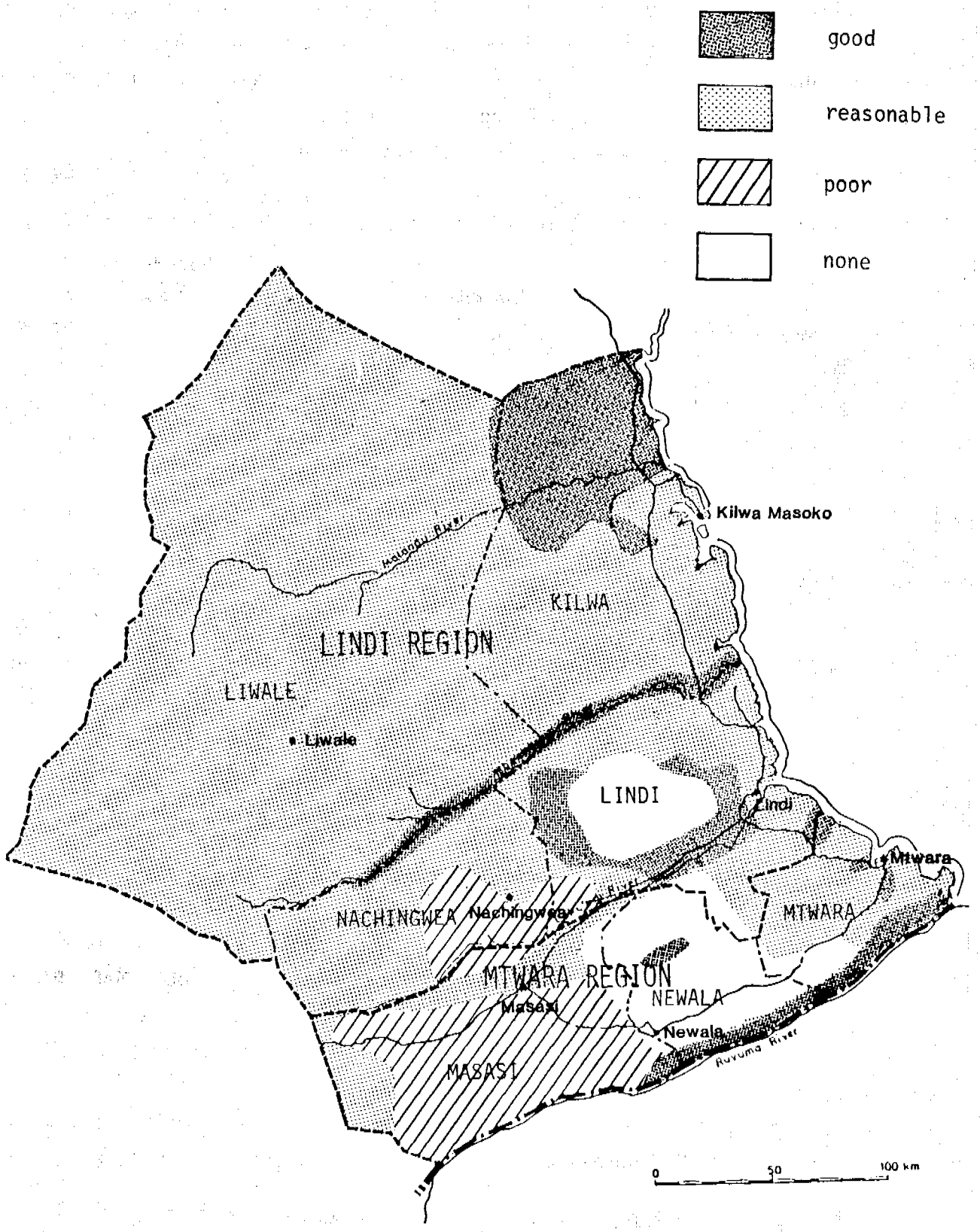
Masasi District belongs to the Basement-zone which is generally a poor groundwater area.

Shallow groundwater exists nearly entirely as a form of perched water thus being available normally only in small quantities and liable of drying up during periods of small groundwater recharge. Deepening of a dry well does not normally increase the amount of water because it only increases the storage capacity of the well. In general, shallow groundwater quality is not very good but mostly acceptable. In river valleys and depressions, where water would otherwise be available in large quantities, it is often too saline for human consumption.

When utilizing shallow groundwater, soil conditions favour dug wells rather than tube wells, because sandy layers are rare.

Deep groundwater is usually found at depths of 10-40 metres and it occurs mainly in the weathered zone of the basement rock or in faults. The amount is usually sufficient only for hand pumps. Water quality is generally poor, especially salinity is high, which is the main reason for abandoning of sufficiently yielding boreholes. It has been observed that better groundwater quality can be found in topographically higher areas rather than in valleys.

FIGURE 7 General Shallow Groundwater Potential



4.43 Mtwara District

Mtwara District belongs partly to the Coast-zone and partly to the Plateau-zone. Groundwater infiltration is good but the groundwater table lies deep because of the thick formations except in valleys and low laying areas. Relatively large perched water aquifers are common in the western areas near the coast and can be used for ring wells or tube wells. In these aquifers, groundwater level fluctuations are large and great well depths are therefore required. Further inland in the Plateau, shallow wells are normally not possible.

Deep groundwater has been found in large quantities in several locations such as Mtawanya, Ziwani, Mikindani and Nanyamba, which all are located on the edge of the Plateau. Further inland, sandy formations are thick and the groundwater table lies very deep even in the deep river valley.

Water quality is usually good although excessive salinity and hardness occur in some wells where sea water influence exists. In western Plateau-zone, deep groundwater often contains a high amount of carbon dioxide.

4.44 Newala District

Newala District belongs to the Plateau-zone. Groundwater potential is theoretically good but economically exploitable only in deep river valleys and at the lower edges of the Plateau due to the deep groundwater level.

Shallow groundwater can be found only in Kitangari valley and in Ruvuma valley. Springs are found on the lower reaches of the Makonde Plateau. Water quality has been good in all the few dug wells constructed in the area.

Deep groundwater has been successfully exploited in Kitangari valley where aquifers are located at reasonnable depths. The groundwater potential of Kitangari valley is at least 12,000 m^3/d but may be even more than double of that amount. Water quality is good although high carbon dioxide contents cause aggressiveness.

In other parts of the district, economically feasible deep groundwater does not exist.

4.45 Kilwa District

Kilwa District belongs mainly to the Plateau-zone with a narrow Coastal strip on the east and the Basement-zone in the west.

The availability of groundwater has generally been good although difficult areas such as Pande exist. There are also large unpopulated areas where groundwater availability is unknown.

Shallow groundwater, mostly is perched water, has been found in all geological zones although the Western Basement-area has not been explored. The best shallow groundwater aquifers have been found along the river-beds where sandy sediments are common. In the Coastal strip, there are areas where coral rocks are dominating and sandy deposits uncommon. The groundwater level is near the sea level and the groundwater quality affected by the sea water. In other parts of the district, the shallow groundwater quality is normally good.

Deep groundwater has not been much explored in Kilwa District except for Kilwa peninsula where considerable quantities of good groundwater have been found. A potentially good area is also Mbarawala Plateau west of Kilwa Masoko where more than 25,000-30,000 m^3 of groundwater is estimated available. A rich aquifer has been found near Ruhatwe where the yield has been estimated at about 2,500 m^3/d.

The quality of deep groundwater has been good in all boreholes.

4.46 Lindi District

The bulk of the Lindi District belongs to the Plateau-zone with a narrow Coastal-zone and the western parts of the District being part of the Basement-area.

Groundwater potential varies but is generally good due to the varying geological conditions.

Shallow groundwater has been taken into use successfully except in Rondo Plateau where the groundwater table is too deep. Most of the shallow wells seem to tap the basic groundwater or large perched water aquifers. The majority of the wells are therefore perennial. Water quality is generally acceptable.

Deep groundwater has been found in Lukuledi valley and on the lower reaches of Rondo Plateau. Water quality has been good except in the two boreholes drilled in the Basement-area in Ruangwa where salinity has been excessive. Groundwater table in Rondo Plateau is too deep for economical boreholes.

4.47 Liwale District

The eastern part of Liwale District belongs to the Basement-zone whereas the western part belongs to the Karroo. Only few water supplies have been constructed in the scarcely populated area. Thus experience on groundwater is limited. Groundwater potential can be estimated to be generally limited in the Basement-zone and reasonably good in Karroo.

The shallow wells constructed in the eastern Basement-zone have been variably successful with often limited yields. A considerable number of wells dry up during dry seasons. Salinity has caused problems as well. In Karroo, wells have been more successful and of good quality. It seems that most of the shallow aquifers are perched water.

Only few boreholes have been drilled in Liwale and not very successfully. It can be assumed that their potential is small in the Basement and reasonable in Karroo.

4.48 Nachingwea District

Nachingwea District belongs to the Basement-zone. Therefore the general groundwater potential is limited, although better than in Masasi, due to the higher rainfall and thicker and more sandy soil layers on top of the baserock.

Shallow groundwater has been taken into use successfully, and most of the wells give sufficient amount of water and are perennial. This is partly a result of more critical and careful site selection, which has been the practice after the dry period of 1981-82. Typical for the Basement, salinity has been high on several occations.

VILLAGE QUESTIONNAIRE FORM

MTWARA - LINDI MASTER PLAN UPDATING

Filled by _____ Date _____

Persons interviewed:

- Village Chairman, Mr. _____
- Village Secretary ☐ - Village Manager ☐
- Village Well Caretaker ☐ - Bwana Afya ☐
- Others _____

Village meeting was arranged ☐

LOCATION

1. Name of village _____ 2. Sub-villages _____
2. Sub-village of _____ 4. Reg. n:o _____
5. Joining the village of _____

x6. Region: Mtwara ☐ Lindi ☐

x7. District _____ x8. Division _____

x9. Ward _____

x10. Map ref _____ x11. Air photo ref _____

x12. Longitude _____ E x13. Latitude _____ S

x14. Altitude _____

POPULATION

+15. Census 1978: _____ +growht rate _____ %/A

o16. Administration (district/div.): _____ growht _____ %/A

17. Village: _____ people _____ working people
_____ households (Kaya)

18. People moving: into village ☐ out village ☐ not moving ☐

x19. Comments on the estimates and growht _____
_____
_____

LIVESTOCK

o20. Livestock officer: _____ cattle, growht _____ %/A
_____ sheep/goat, growht _____ %/A

21. Village: _____ cattle _____ sheep/goat

x22. Comments on the estimates and growht _____
_____
_____

PRESENT WATER SUPPLY

23 Existing water systems: piped W/S ☐ handpump wells ☐ open well ☐ river ☐ open dam ☐ open pit ☐ springs ☐ rainwater collect. ☐

24. Main supply: Type _____ Number _____ used _____ months during dry ☐ wet ☐ season, distance from _____ km to _____ km, means of abstraction _____ Used mainly for _____

25 Supply II: Type _____ Number _____ used _____ months during dry ☐ wet ☐ season, distance from _____ km to _____ km, means of abstraction _____

26. Supply III: Type _____ Number _____ used _____ months during dry ☐ wet ☐ season, distance from _____ km to _____ km, means of abstraction _____

NOTE: FOR EACH WATER SYSTEM, FILL A SEPARATE SHEET

27. Main consumers: Own W/S, which

Shcool	☐ , which _____	☐ _____
Administration	☐ , which _____	☐ _____
Dispensary	☐ , n:o of inpatients___outpat.___	☐ _____
Shops	☐ , n:o _____	☐ _____
Institution	☐ , which _____	☐ _____
Other	☐ , which _____	☐ _____

28. Are other villages using the same W/S: No ☐ Yes ☐ , which villages? _____

29. Water for cattle: Same as for people, Partly same, Different, which

- dry season	☐	☐	☐	_____
- wet season	☐	☐	☐	_____

30. Main complaints on the W/S situation _____

x31. Comments on the present W/S situation _____

FURTHER WATER SUPPLY

32. Primary needs for future water supply: drinking water ☐ other household use ☐ cattle ☐ irrigation ☐ other productive use ☐

33. How do you want to improve washing and cattle watering facilities: _____

34. Have the village council discussed about the future water supply to the village: Yes ☐ No ☐

35. If "yes", did you make a formal request to local authorities about water?

_____

36. Future W/S: Present sufficient ☐ (which _____)
Present to be rehabilitated ☐ (which _____)
Present to be expanded ☐ (which _____)
New water supply ☐ , type _____

x37. Possible new source: Spring ☐ Stream ☐ Other W/S ☐ Descripe: _____

_____

x38. Distance between the new source and village _____ km

x39. Comments on the future W/S _____

_____

_____

HEALTH AND SANITATION

o40. Common diseases: Diarrhoea ☐ Malaria ☐ Billharzia ☐ Measles ☐ Filariosis ☐ Kolera ☐ Other _____

o41. Has there been any recent epidemic outbreaks: _____
_____ When: _____

o42. Children mortality _____

43. Staple food: Maize ☐ Cassava ☐ Rise ☐ Other _____

44. How many households have their own pit latrines _____ %

45. How many latrines have roofs _____ % slabs _____ %

x46. Comments on the health and sanitation situation _____

_____

VILLAGE ECONOMY

47. Which co-operatives exist in the village? _____

48. Amount of commonly owned field _____ hectares, cattle _____ n:o
Other: _____

49. Self-help activities carried out: No ☐ Yes ☐ Which and when _____

_____

50. Village willing to contribute to the water development project with labour ☐ materials ☐ money ☐ money for maintenance ☐

51. Village willing to deepen the existing wells, if material are provided: Yes ☐ No ☐

52. Comments _____

_____

NOTE: QUESTIONS MARKED WITH: x = to be answered mainly by the interviewer
o = " a higher authority
+ = to be filled in the office

VILLAGE DATA FORM

Name of the Village:
Sub-villages:
Sub-village of:
Ward, Name: Code:
Division, Name:

Population, village 1984:
Population, census 1978:
Estimated 1984 population:
Growth rate, % p.a.
Cattle 1984:
Growth rate cattle, % p.a.
Sheep 1984:
Goats 1984:
Pigs 1984:
Small livestock growth rate, % p.a.
Livestock using W/S in 1984, %:
Livestock using W/S in 2001, %:
Existing W/S:
Distance to main supply, km:
Distance to secondary supply, km:
Improved W/S constructed:
Piped W/S in operation during visit:
Number of hand pump wells:
Main complaints on W/S situation:
Proposed future W/S:
Source of future W/S:
Households having latrines, %:
Standars of latrines:
Village ready to contribute towards W/S construction:
Village ready to contribute towards W/S maintenance:
N. of sufficient hand pump wells:
N. of insufficient hand pump wells:
N. of hand pump wells, which dry up:
N. of hand pump wells with salty water:
N. of hand pump wells with dirty water:
Piped W/S service level:
Handpump W/S service level:

BASIC VILLAGE DATA

Masasi District
Mtwara District
Newala District
Mtwara-Mikindani Town
Kilwa District
Lindi District
Liwale District
Nachingwea District
Lindi Town

Key for the abreviations and symbols

Column 3: Livestock in livestock units
1 unit = 1 cow
= 5 sheep or goats or pigs

Column 4:
1 = piped water supply
2 = hand pump
3 = open well
4 = river
5 = dam
6 = open pit
7 = spring
8 = rainwater harvesting

Columns 5 and 6: Distances in kilometres

Column 7:
0 = piped W/S not in operation
1 = piped W/S in operation
2 = piped W/S under construction

Columns 13 and 14:

0: **No service, nothing or practically nothing constructed**

1: **No real service, but something is being done**

a) piped W/S
- operating W/S (> 50 % of time) > 5 km away
- operational W/S (< 50 % of time) within 1-5 km
- piped W/S constructed, not operational

b) hand pumps
- > 600 pers/sufficient well
- 250 - 600 pers/insufficient (seasonal or saline, but used) well
- sufficient wells, 250 - 600 pers/well, within 1-5 km
- insufficient wells, < 250 pers/well, within 1-5 km

2: **Some service, but insufficient or irregular**

a) piped W/S
- operational W/S within 1 km
- operating W/S within 1-5 km

b) hand pumps
- sufficient wells, 250 - 600 pers/well,within 1 km
- insufficient wells, <250 pers/well, within 1 km
- sufficient wells, < 250 pers/well, within 1-5 km

3: **Good service**

a) piped W/S
- operating and sufficient W/S (25 lcd) within 1 km

b) hand pumps
- sufficient wells, < 250 pers/wells, within 1 km

11 MASASI DISTRICT

Divisions		Wards	
01	Nakopi	01	Lumesule
		02	Napacho
		03	Likokona
02	Nanyumbu	01	Nangomba
		02	Nanyumbu
		03	Masuguru
		04	Mkonona
03	Lisekese	01	Namatutwe
		02	Mikangaula
		03	Maratani
		04	Lukuledi
		05	Lisekese
		06	Nandete
		07	Mpindimbi
		08	Marika
04	Chiungutwa	01	Nanjota
		02	Chiungutwa
		03	Lipumburu
		04	Mbuymi
05	Mchauru	01	Sindano
		02	Mchauru
		03	Mnavira
06	Lulindi	01	Namalenga
		02	Lulindi
		03	Mkululu
		04	Mkundi
07	Chikundi	01	Chiwata
		02	Chigugu
		03	Mwena
		04	Nanganga

District : MASASI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in- suff.	sea-son.	salty	Service level piped W/S	hand pump
Division : NAKOPI													
Ward code: 110101 LUMESULE													
LUMESULE	1.010	0	4 2	1,7	0,5		4	4	0	0	0	0	3
- NAKANYUNYA													
- MAKANDAVALE													
CHIGWEJE	1.148	0	6	0,7		0	0	0	0	0	0	0	0
- NAMIUNGO													
- CHANGWALE													
NANDEMBO	1.320	1	6 1	0,7	0	1	0	0	0	0	0	2	0
- NGALINJE													
Total ward	3.478	1		1,03	0,25	1	4	4	0	0	0		
Ward code: 110102 NAPACHD													
CHIMIKA	950	4	6	0,6		0	0	0	0	0	0	0	0
- KAZAMOYO	691	0	2	0,5		0	2	2	0	0	0	0	2
NDACHELA	777	0	6 4	0,7	0,5	0	0	0	0	0	0	0	0
- MITONGA													
NAKOPI	1.395	9	2 6	0,5		0	6	6	0	0	0	0	3
- MIKANGAULA													
- MITUMBATI													
MPOMBE	1.555	0	2	0,2		0	4	4	0	0	0	0	2
- MTEMAUPINDE													
MBURUSA	1.255	1	6 2	0,3		0	1	1	0	0	0	0	1
- NAPACHD													
Total ward	6.623	14		0,47	0,50	0	13	13	0	0	0		

District : MASASI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 110103													
LIKOKONA													
MICHIGA	2.917	14	6	0,3		0	0	0	0	0	0	0	0
- NAIPINGO													
MAKONGONDERA	1.216	3	2	0,5		0	5	5	0	0	0	0	3
MKUMBARU	1.882	30	6	0,7		0	0	0	0	0	0	0	0
- MWAMBO													
- SONGAMBELE													
- LUKUMBI													
MSINYASI	715	4	6	0,7		0	0	0	0	0	0	0	0
- MISAWAJI													
- KAZAMOYO													
LIKOKONA	1.715	20	6 2	1	0,5	0	5	3	0	2	2	0	2
Total ward	8.445	70		0,64	0,50	0	10	8	0	2	2		
Total division	18.546	85					27	25	0	2	2		

District : MASASI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps in suff.	in- suff.	sea-son.	salty	Service level piped W/S	hand pump
Division : NANYUMBU													
Ward code: 110201 NANGOMBA													
MASWERA	878	21	6	0,6		0	0	0	0	0	0	0	0
MARA	1.244	3	3			0	0	0	0	0	0	0	0
MSENGENYA	1.716	29	2 6 3			0	5	5	0	0	0	0	2
KILIMA HEWA	3.039	54	6 1									1	0
MANGAKA	2.207	41	6 1			0	0	0	0	0	0	1	0
MNEMEKA	1.024	5	6			0	0	0	0	0	0	0	0
- MKOMA													
NDWIKA	564	0	6 3 1	0,7		0	0	0	0	0	0	1	0
MNONIA	895	0	2 4			0	2	0	1	1	0	0	1
NGALINJE	816	11	6	1,2		0	0	0	0	0	0	0	0
MWAMBANI	689	1	4 6	2,5		0	0	0	0	0	0	0	0
NAHAWARA	1.575	0	2			0	6	6	0	0	2	0	2
NACHIURA	1.512	10	6			0	0	0	0	0	0	0	0
NANGOMBA	2.193	133	2 6 1			0	3	2	1	0	0	1	1
MSYALELE	844	5	6									0	0
MTOKORA	1.200	0	6			0	0	0	0	0	0	0	0
Total ward	20.396	311		1,25	0	0	16	13	2	1	2		

District : MASASI

	Popul- ation 1984	Live- stock units 1984	Exist- ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in- suff.	sea- son.	salty	Service level piped W/S	hand pump
Ward code: 110202													
NANYUMBU													
NANYUMBU	1.286	9	2 1			0	2	2	0	0	0	1	1
CHUNGU	617	0	2 1			0	2	2	0	0	0	1	2
MAKANYA	789	14	6			0	0	0	0	0	0	0	0
NAMASONGO	1.014	16	2 6		1	0	1	1	0	0	0	0	1
MANEME	501	0	2			0	2	2	0	0	0	0	3
CHIPUPUTA - CHIPUTA SHULENI	2.035	13	2 6		1,2	0	1	0	0	1	0	0	1
CHITOWE - NAKARARA	668	0	6 5			0	0	0	0	0	0	0	0
NAMAGURUVI	2.577	2	6			0	0	0	0	0	0	0	0
MPWAKIA - TAWINI	988	15	6	2		0	0	0	0	0	0	0	0
MKUULA	1.041	17	6 1	0,5		0	0	0	0	0	0	1	0
NANDERU	1.118	2	2			0	4	4	0	0	0	0	2
Total ward	12.634	88		1,25	1,10	0	12	11	0	1	0		

District : MASASI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 110203													
MASUGURU													
LUKWIKA	460	0	2 4 6			0	1	1	0	0	0	0	2
LUKULA	1.378	0	6 1	1,6		0	0	0	0	0	0	1	0
- LUNGOMBE													
MASUGURU	1.194	0	2 6			0	2	2	0	0	0	0	2
Total ward	3.032	0		1,60	0	0	3	3	0	0	0		
Ward code: 110204													
MKONONA													
NAMIJATI	734	51	2			0	2	2	0	0	0	0	2
MARUMBA	476	0	6			0	0	0	0	0	0	0	0
- NAMBUNDA													
CHILUNDA	535	0	2			0	4	4	0	0	0	0	3
- MTANDI													
MITUMBATI	726	20	2			0	5	5	0	0	0	0	3
NJISA	806	61	6	0,6		0	0	0	0	0	0	0	0
Total ward	3.277	132		0,60	0	0	11	11	0	0	0		
Total division	39.339	531					42	38	2	2	2		

District : MASASI

Division : NANYUMBU

Ward code: 110204

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
MKONONA													
NAMIJATI	734	51	2			0	2	2	0	0	0	0	2
MARUMBA	476	0	6			0	0	0	0	0	0	0	0
- NAMBUNDA													
CHILUNDA	535	0	2			0	4	4	0	0	0	0	3
- MTANDI													
MITUMBATI	726	20	2			0	5	5	0	0	0	0	3
NJISA	806	61	6	0,6		0	0	0	0	0	0	0	0
Total ward	3.277	132		0,60	0	0	11	11	0	0	0		
Total division	39.339	531					42	38	2	2	2		

District : MASASI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Division : LISEKESE													
Ward code: 110301													
NAMATUIWE													
MKWAPA	805	5	6	1,5		0	0	0	0	0	0	0	0
- MKWAPA SHULENI													
- MKWAPA OFISINI													
CHIKOWETI	1.488	22	2 3 1		3,5	0	7	0	0	7	1	1	1
NAMAJANI	1.550	278	2 3 1		8	0	10	0	0	10	0	2	2
- NAMICHI	600	0	2 3		4,5	0	2	0	0	2	0	0	1
MSIKISI	786	0	2 4				2	2	0	0	0	0	2
NAMATUIWE	704	0	2 1 4			0	4	2	0	2	0	2	2
CHINGULUNGULU	1.280	2	2 5			0	4	0	0	4	0	0	1
- PACHANI													
NAMALEMBO	911	0	6									0	0
AMANI CHILOLO	1.812	0	2 3			0	18	18	0	0	0	0	3
- AMANI NGALOLE	2.278	24	2 3		4,5	0	12	6	0	6	0	0	2
- AMANI MAGEREZA	500	275	2 1			1	3	0	0	3	0	3	2
MLINGULA	2.477	11	2 1			0	20	0	0	20	0	2	2
Total ward	15.191	617		1,50	5,13	1	82	28	0	54	1		

District : MASASI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 110302 MIKANGAULA													
NANGARAMO	510	989	6 2	1,2	0,5	0	2	2	0	0	0	0	3
MIKANGAULA	3.989	35	6 2 1	0,3		0	4	2	0	2	0	1	1
NAHIMBA	1.161	31	6	1,8		0	0	0	0	0	0	0	0
- MSANGUSANGU													
- NGALINJE													
KILOSA	1.587	4	1 6		1,2	1	0	0	0	0	0	1	0
- MBARA													
- MBARUKU													
MKWAJUNI	1.090	17	6			0	0	0	0	0	0	0	0
- NAWAJI													
- KILIMAHEWA													
- CHITWANGULE													
KAMUNDI	634	1	4 6	1,7	1,7	0	0	0	0	0	0	0	0
- MKOROMWANA													
- CHITANDI													
- KITANGALI													
NAMATUMBUSI	1.918	357	6 1	2,7		0	0	0	0	0	0	2	0
- MIRAMBO													
- NAPAKO													
Total ward	10.889	1.433		1,54	1,13	1	6	4	0	2	0		

District : MASASI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 110303													
MARATANI													
MARATANI	2.099	111	6 7	0,2	4,5	0	0	0	0	0	0	0	0
- MALEMA													
- MCHANGANI A,B													
- MAJENGO													
- MRAUSHI													
MIKUVA	1.400	45	6									0	0
LIPUPU	577	1	6	0,2		0	0	0	0	0	0	0	0
- NAMILOLO													
HOLOLA	1.165	39	6 4	4,5	1,7	0	0	0	0	0	0	0	0
- MWAMBA													
- MITIMINGI													
MNANJE	1.781	45	6	1,5		0	0	0	0	0	0	0	0
- CHIKUNJA SHULENI													
- MNANJE CHINI													
NGUPE	1.674	15	5 6	0,7	0,7	0	0	0	0	0	0	0	0
- MAPINDUZI													
Total ward	8.696	256		1,42	2,30	0	0	0	0	0	0		

District : MASASI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 110304 LUKULEDI													
NAMBAWALA - MACHITE	1.094	11	2 6	6	6	0	8	8	0	0	1	0	3
MRAUSHI - MWANGAWAKO - MASONGA - MCHOLI	1.945	1	2 3 6	2	2	0	2	1	0	1	0	0	1
NANYINDWA	1.188	7	1 6 2	0,7	0,7	0	3	1	0	2	0	1	1
LILALA	1.172	11	2 3			0	3	3	0	0	0	0	2
CHIWALE	1.284	0	2 3 1			0	5	0	0	5	0	2	2
LUKULEDI	3.780	92	2 6 5	0,7	0,7	0	11	8	3	0	0	0	2
MKOROPOLA	1.153	17	6	1,5		0	0	0	0	0	0	0	0
NASINDE - NASINDE NANGOMBA	1.035	78	2 6		0,7	0	2	2	0	0	0	0	2
NAPATA - MAGUMCHILE - MKALINGA - NAGAGA	1.544	44	2 6	0,2	0,2	0	3	3	0	0	0	0	2
CHIKUNJA - NANDITI	1.898	46	2 6	0,7	0,4	0	6	5	0	1	1	0	2
Total ward	16.093	308		1,69	1,53	0	43	31	3	9	2		

District : MASASI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 110305													
LISEKESE													
MBONDE	2.030	119	2 6		0,2	0	8	5	0	3	0	0	2
TEMEKE	1.293	51	6	0,5		0	0	0	0	0	0	0	0
- NAMKARAWE													
TUKAEWOTE	1.630	48	6 7 4	1	4	0	0	0	0	0	0	0	0
- NGALINJE													
- CHIWISI													
MKARANGO	1.949	60	6									0	0
MTAKUJA	1.489	18	2 6	0,5	1,2	0	8	5	0	3	0	0	3
- MAROKOPALENI													
NANGOSE	1.000	38	2 6	0		0	3	1	1	1	0	0	1
MAKULANI	2.542	76	2 1			0	2	2	0	0	0	2	1
MKARAKATE	1.504	33	1			1	0	0	0	0	0	2	0
SULULU	2.091	33	6 1	0,7		0	0	0	0	0	0	2	0
- CHIUNGUTWA													
MKAPUNDA	2.084	37	2 6	0,7	1,2	0	11	10	0	1	0	0	3
- NANDUMBILI													
MPEKESO	1.713	46	6	1,2		0	0	0	0	0	0	0	0
- MPEKESO JUU													
- MPEKESO CHINI													
- NGUPE MACHENJE													
MATAWALE	1.324	15	6	0,7		0	0	0	0	0	0	0	0
MWENGE MTAPIKA	1.562	54	2 6	1,2	1,2	0	6	5	0	1	0	0	2
NAMKUNGWI	1.088	4	1 6		9	1	0	0	0	0	0	2	0
- MTOWASIRI													
MTANDI	2.035	88	1 2			1	5	3	0	2	0	3	1
- KACHULU													
- MCHOKONYO													
MASASI TOWN	19.700	355	1 2	0	0,5	1	50	20	20	10		2	2
- MKOMAINDO BLOCK													
- MAKUTI BLOCK													
Total ward	45.034	1.074		0,65	2,47	4	93	51	21	21	0		

District : MASASI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in	oper.	Hand pumps total	suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 110306														
NANDETE														
NANDETE	1.760	30	6 1	1,5		0	0	0	0	0	0	2	0	
- KALOLENI														
- NAKOPWITI														
CHAKAMA	1.656	44	2 6	1,5		0	8	7	0	1	0	0	3	
NAVAI	1.219	23	6 7	0,7	0,2	0	0	0	0	0	0	0	0	
- MKANGARA														
MTALIKACHAU	990	3	6	1,2		0	0	0	0	0	0	0	0	
- MTENDACHI														
ULANGA	1.468	44	6	1,5		0	0	0	0	0	0	0	0	
- SEMENI														
CHIVIRIKITI	1.045	2	6 7	0,7		0	0	0	0	0	0	0	0	
- MZALENDO														
NAKOLE	1.020	0			0							1	0	
- MKARAKATE														
- CHITUKANI														
Total ward	9.150	147		1,18	0,20	0	8	7	0	1	0			

District : MASASI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	Dist. to W/S 2.	Piped W/S in oper.	Piped W/S total	Hand pumps suff.	Hand pumps in-suff.	Hand pumps sea-son.	Hand pumps salty	Service level piped W/S	Service level hand pump
Ward code: 110307 MPINDIMBI													
CHANIKANGUO - NAMAKONGWA	1.920	185	1 2		0,7	1	4	4	0	0	0	3	2
KANYIMBI - MJUNGANO - NAMAHAMBA	1.497	161	6	1,2		0	0	0	0	0	0	0	0
CHISEGU - MKAJAMILA - MKATIOKA	1.280	15	1 2 6			0	2	2	0	0	0	3	1
KACHEPA - MINJALE	1.502	79	1 2		1	1	3	3	0	0	0	3	2
SHAURI MOYO	1.266	225	1 6	0	0,7	1	0	0	0	0	0	3	0
MPINDIMBI - MAPALE	2.839	92	1 2 6		1	1	4	3	0	1	0	3	1
Total ward	10.304	757		0,60	0,85	4	13	12	0	1	0		

District : MASASI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 110308													
MARIKA													
MARIKA	1.423	136	6	2	0	0	0	0	0	0	0	0	0
- SAUTIMOJA													
- KAZAMOYO													
NAMATUNU	1.080	64	2 6		0,7	0	1	1	0	0	0	0	1
- IPIHO													
- NAZARETI													
- MSAKALA													
MLUNDELUNDE	1.915	52	2 3 4		3,5	0	1	1	0	0	0	0	1
- MCHAKA													
- MPOTA													
NAMIKUNDA	1.923	101	6	0,2		0	0	0	0	0	0	0	0
- CHIPOLE													
MUMBAKA	2.452	132	2 3			0	4	2	0	2	0	0	1
- MAJENGO													
- NAKWANDE													
- MACHOMBE													
- KILIMANI-HEWA													
- MIPAKANI													
Total ward	8.793	485		1,10	1,40	0	6	4	0	2	0		
Total division	124.150	5.119					251	137	24	90			

District : MASASI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Division : CHIUNGUTWA													
Ward code: 110401 NANJOTA													
NANJOTA	2.395	42	2 3		4	0	12	0	0	12	0	0	1
- MIGONGO													
NAMBUNDA	2.716	112	6 2	0,7	1,2	0	6	6	0	0	0	0	2
- MPWAPWA JUU													
- TUPENDANE													
MLJELEJELE	1.606	90	2 3 4			0	5	5	0	0	0	0	2
- TULEANE-MPUTENI													
- MTENGULA													
- MPWAPWA													
NAIROMBO	987	100	6 2 4	5,5		0	6	3	0	3	0	0	2
Total ward	7.704	345		3,10	2,60	0	29	14	0	15	0		

District : MASASI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 110402													
CHIUNGUTWA													
CHIUNGUTWA	2.700	135	1 6		2,5	0	0	0	0	0	0	2	0
- KALIPINDE													
CHINI													
MISECHELA	1.992	228	6	4,5		0	0	0	0	0	0	0	0
- LUKONDESI													
- CHILIMBA													
- LISANJE													
MAUGURA	2.208	44	2 4 1	3	1,4	0	7	6	0	1	0	1	3
- MASUGURU													
- NGALINJE													
- MNELAWINA													
HUWE	679	34	6	5	0	0	0	0	0	0	0	0	0
- CHANIKA	300	0	2 6	0,5		0	2	2	0	0	0	0	3
- MAKANYAMA	789											1	0
- PACHOTO													
MIPANDE	814	67	2 4		2,5	0	6	2	0	4	0	0	2
- KALIPINDE													
- MTENGA													
MPETA	1.913	44	2 3 1			0	17	0	0	17	0	1	1
- MRASHI													
Total ward	11.395	553		3,25	1,60	2	32	10	0	22	0		

District : MASASI

	Popul- ation 1984	Live- stock units 1984	Exist- ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in- suff.	sea- son.	salty	Service level piped W/S	hand pump
Ward code: 110403													
LIPUMBURU													
LIPUMBURU	776	6	6 3	1,2	1,2	0	0	0	0	0	0	0	0
- NAMBUNJU													
- NAKACHERE													
MTOJO	1.008	52	6 4	1,5	9	0	0	0	0	0	0	0	0
- LUPASO													
MCHOTI	1.416	0	4 6	1,5	1,5	0	0	0	0	0	0	0	0
- MBANGARA-MBUYUNI													
- NAMAJANI													
- NANDEMBO													
- NAMIONA													
UTIMBE	906	4	6									0	0
MBANGARA	463	0	6									0	0
- MIESI													
Total ward	4.569	62		1,40	3,90	0	0	0	0	0	0		

District : MASASI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps in-suff.	suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 110404													
MBUYUNI													
MDIBWA	1.798	53	1 6		1,5	1	0	0	0	0	0	2	1
- MATOGORO													
MIUNGO	1.325	60	4 2			0	4	0	0	4	0	0	1
- CHIPINDIMBI													
MPULIMA	1.644	73	6 2	2,5	2,5	0	7	1	0	6		0	1
- MAJEMBE NDAGO													
- LIKANGA JUU													
- LILAWA													
MITONJI	701	40	4 6	4,5	4,5	0	0	0	0	0	0	0	0
- MNONJINI													
MBUYUNI	1.385	70	1 6			1	0	0	0	0	0	2	0
- NAMBARAPI													
- LUCHELEWA													
Total ward	6.853	296		3,50	2,83	2	11	1	0	10	0		
Total division	30.521	1.256					77	25	0	47	0		

District : MASASI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps in- suff.	sea- son.	salty	Service level piped W/S	hand pump
Division : MCHAURU												
Ward code: 110501 SINDANO												
LUATALA	2.177	154	1 6		3,5	1	0	0	0	0	2	0
- LULEMBA												
- NDENDEMAMA												
SINDANO	1.668	38	1 4 6		0,7	0	0	0	0	0	1	0
- SINDANO A												
- SINDANO B												
LICHEHE	729	15	1 4 6		1,7	0	0	0	0	0	1	0
- MGWAGULE												
- MITANDAWALA												
ULUNGU	908	0	6 4	9	9	0	0	0	0	0	0	0
- MSIKISI												
- NDOMONI												
- NG'UNI(ULUNGU)												
Total ward	5.482	208		9,00	3,73	1	0	0	0	0	0	

District : MASASI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in	oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 110502														
MCHAURU														
RIVANGO	1.380	10	1 4 6			1,7	1	0	0	0	0	0	3	0
- RIVANGO A														
- RIVANGO B														
NAMOMBWE	1.751	52	1 6			1,5	1	0	0	0	0	0	3	0
- MKUMBULULU														
- MWITIKA														
MIREWE	1.387	124	4 6	0,7		0,7	0	0	0	0	0	0	0	0
- TAPUTA														
- NANGANGA														
MCHAURU JUU	1.836	157	4 6	0,2		1,2	0	0	0	0	0	0	0	0
- MIOTA														
- MAKOCHI														
NANGOMWA	387	8	4 6	5,5		0,7	0	0	0	0	0	0	0	0
MAPARAWE	826	51	4	2,2			0	0	0	0	0	0	0	0
MKWO	1.733	0	4 6	7		2,5	0	0	0	0	0	0	0	0
- NALIMBUDI														
Total ward	9.300	403		3,12		1,38	2	0	0	0	0	0		

District : MASASI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps in- suff.	sea- son.	salty	Service level piped W/S	hand pump
Ward code: 110503 MNAVIRA												
NAKARARA	1.493	45	1 6 4		0,2	0	0	0	0	0	2	0
MAPILI	111	114	1 4 6		7,5	0	0	0	0	0	2	0
- RAHALEO												
MANYULI	407	39	1 4 6		5,5	0	0	0	0	0	2	0
MNAVIRA	821	87	1 4 6		1,7	0	0	0	0	0	2	0
MKACHIMA	1.599	102	1 4		3,5	0	0	0	0	0	2	0
- CHIPINGO												
- MKALIWATA												
MAKONGONDA	2.005	53	1 4 6		1,2	1	0	0	0	0	2	0
- MKWAYA												
- MAKONGONDA CHINI												
GEUZA	569	18	4	3,5		0	0	0	0	0	0	0
- NALIONGOLO												
- MDUHE												
- NAMJIEMA												
NAMYOMO	665	103	4 6	14,5	1,7	0	0	0	0	0	0	0
CHIKOROPOLA	1.650	25	1 4 6		5,5	0	0	0	0	0	2	0
Total ward	9.320	586		9,00	3,35	1	0	0	0	0	0	
Total division	24.102	1.197					0	0	0	0	0	

District : MASASI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in- suff.	sea-son.	salty	Service level piped W/S	hand pump
Division : LULINDI													
Ward code: 110601													
NAMALENGA													
NAMALENGA	2.043	40	1 6		2,5	0	0	0	0	0	0	3	0
NAGAGA	1.490	134	1 6		0,7	0	0	0	0	0	0	3	0
MPILIPILI	1.347	220	1 4 6		4,5	0	0	0	0	0	0	2	0
MVITA	767	75	1 6	2,2	3,5	0	0	0	0	0	0	2	0
- CHIGEWA													
- MAJENGO													
MITESA	940	8	1 6 4		0,7	0	0	0	0	0	0	3	0
MSANGA	840	33	1 6 4		5,5	0	0	0	0	0	0	3	0
- MAPINDUZI													
- JUHUDI													
- KATUNDU													
MSOKOSELA	589	101	4 6	0,7	0,7	0	0	0	0	0	0	0	0
- MBURUSA													
- LISIMALYAO													
Total ward	8.016	610		1,45	2,59	0	0	0	0	0	0		
Ward code: 110602													
LULINDI													
LULINDI	2.070	223	1 4 6		0,7	1	0	0	0	0	0	3	0
MKASEKA	783	24	1 4		2,5	1	0	0	0	0	0	3	0
CHIWAMBO	1.040	97	1 4		0,7	0	0	0	0	0	0	3	0
- NAMAJANI													
- KISIWANI													
KIVUKONI	1.351	27	1 6		4,5	0	0	0	0	0	0	2	0
- MTAKUJA													
- MNOPWE													
- RAHALEO													
LUAGALA	1.315	46	1 4			0	0	0	0	0	0	2	0
Total ward	6.559	416		0	2,10	2	0	0	0	0	0		

District : MASASI

	Popul- ation 1984	Live- stock units 1984	Exist- ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in- suff.	sea- son.	salty	Service level piped W/S	hand pump
Ward code: 110603													
MKULULU													
MKULULU	1.382	45	1			0	0	0	0	0	0	2	0
MFUTO	1.185	70	2 6	1,2	1,2	0	10	9	0	1	0	0	3
- MNOLELA													
- LUSONJE													
- CHINOLO													
NAKACHINDU	893	55	2 6	0,7	0,2	0	2	1	0	0	0	0	2
MIBA	1.145	214	1 4 6		0,2	0	0	0	0	0	0	2	0
- MBUGO													
- MKWAYA													
MPOPO	918	59	6	0,2		0	0	0	0	0	0	0	0
- MKONDE													
- MBALICHILA													
Total ward	5.523	443		0,70	0,53	0	12	10	0	1	0		
Ward code: 110604													
MKUNDI													
MKUNDI	1.594	103	4 6	1,2	1,2	0	0	0	0	0	0	0	0
MKOROPOLA	1.454	299	6	1,2		0	0	0	0	0	0	0	0
- NANGWALE													
- MKOROPOLA CHINI													
- NAKALOLA CHINI													
NAKALOLA	1.114	314	6 4	2	2,5	0	0	0	0	0	0	0	0
MAJEMBE	1.647	111	1 4 6		0,7	0	0	0	0	0	0	2	0
- KITUNDA													
- MAJEMBE KATI													
MIWALE	810	83	1 4 6		2,5	0	0	0	0	0	0	2	0
CHIPANGO	751	116	4 6	1,2	1,2	0	0	0	0	0	0	0	0
- NJECHELE													
Total ward	7.370	1.025		1,40	1,62	0	0	0	0	0	0		
Total division	27.468	2.494					12	10	0	2	0		

District : MASASI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in	oper.	total	Hand pumps in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Division : CHIKUNDI													
Ward code: 110701 CHIWATA													
CHIWATA	2.301	86	6	1,7		0	0	0	0	0	0	0	0
CHIDYA	1.542	108	6	1,2		0	0	0	0	0	0	0	0
- NAMAUNYA													
- ZINGATIA													
- NGALINJE													
SAUTIMOJA	1.037	91	4 6	0,7	0,7	0	0	0	0	0	0	0	0
- NANGOLO JUU													
- NANGOLO CHINI													
- MPANGULE													
Total ward	4.880	286		1,20	0,70	0	0	0	0	0	0		
Ward code: 110702 CHIGUGU													
MBEMBA	1.285	18	1 6			1	0	0	0	0	0	3	0
CHIGUGU	1.905	219	1			1	0	0	0	0	0	3	0
LILOYA	1.150	47	1 2			1	2	2	0	0	0	3	2
CHIKUKWE	3.172	98	1 2		0,7	1	4	4	0	0	0	3	1
MAPARAGWE	750	6	2 6	0,2		0	2	2	0	0	0	0	2
MANDIWA	992	36	6 1 2	1,5	0	1	2	2	0	0	0	3	2
- MIHURU													
MBAJU	1.310	12	2 1	0		0	4	4	0	0	0	2	2
- RAHALEO													
Total ward	10.564	436		0,57	0,35	5	14	14	0	0	0		

District : MASASI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in	oper.	total	Hand pumps in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 110703													
MWENA													
CHIKUNDI	4.665	139	1			1	0	0	0	0	0	3	0
MKALAPA	2.208	94	1 2		0,5	1	2	2	0	0	1	3	1
- MKELAPA													
MWENA	2.050	79	1			1	0	0	0	0	0	3	0
MPOWORA	3.576	242	1			1	0	0	0	0	0	3	0
LIPUTU	2.100	42	1 6			1	0	0	0	0	0	3	0
- TUUNGANE													
- NJENGA													
RUKOHE	841	16	6									0	0
Total ward	15.440	612		0	0,50	5	2	2	0	0	1		

District : MASASI

	Popul- ation 1984	Live- stock units 1984	Exist- ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in- suff.	sea- son.	salty	Service level piped W/S	hand pump
Ward code: 110704 NANGANGA													
MKUNG'U	1.382	77	2 4 1	1,2	1,2	0	1	1	0	0	0	2	1
NAMIHUNGO	1.620	50	6 1									0	0
MIHIMA	780	122	6	0,7		0	0	0	0	0	0	0	0
- MIHIMA JUU													
- MIHIMA CHINI													
MUMBURU	1.403	14	1 3			1	0	0	0	0	0	3	0
- RUTAMBA													
- DODOMA													
- MWENA													
- MTAKUJA													
MKAMI	933	0	6									0	0
MPANYANI	480	37	6									0	0
NANGOO	1.642	125	1			1						3	0
MWONGOZO	1.519	137	1 2 7			1	2	1	0	1	0	3	1
NANGANGA	1.600	32	1 4 2		1,2	1	4	2	0	2	0	3	1
MKANGU	1.000												
Total ward	12.359	594		0,95	1,20	4	7	4	0	3	0		
Total division	43.243	1.928					23	20	0	3	1		
Total district	307.369	12.610					427	255	26	146	5		

12 MTWARA DISTRICT

Divisions		Wards	
01	Dihimba	01	Dihimba
		02	Mnima
02	Kitaya	01	Kiromba
		02	Kitaya
		03	Mahurunga
03	Mayanga	01	Mayanga
		02	Naumbu
04	Mpapura	01	Kitere
		02	Mbuo
05	Nanyamba	01	Mtiniko
		02	Nanyamba
		03	Nitekela
		04	Njengwa
06	Ziwani	01	Nalingu
		02	Nanguruwe
		03	Ziwani

District : MTWARA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	Hand pumps total	suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Division : DIHIMBA													
Ward code: 120101 DIHIMBA													
NJUMBULI	752	0	2 3	0,5	4		10	8	0	2	0	0	3
- NAMANJELE	300	0	2 3	0,5	3		2	2	0	0	0	0	3
- MIUTA	300	0	3	3			0	0	0	0	0	0	0
MPONDOMO (DIHIMBA)	1.227	60	1 3	0	3	1	0	0	0	0	0	2	0
DIHIMBA	2.000	37	2 1 3	0,5	0	1	8	5	0	3	0	2	2
MKWAJUNI	733	48	3	3			0	0	0	0	0	0	0
MWEMBE TONGWA	427	11	3	1,5			0	0	0	0	0	0	0
MJUNGANO	946	39	3	1,5		0	0	0	0	0	0	0	0
LYOWA	746	0	3	2			0	0	0	0	0	0	0
- MANAMAWA	300	0	3	3			0	0	0	0	0	0	0
Total ward	7.731	195		1,55	2,50	2	20	15	0	5	0		
Ward code: 120102 MNIMA													
MKUTIMANGO	699	42	3	3	0,5		0					0	0
- NAMALOMBE	300	0	3	4			0	0	0	0	0	0	0
MNIMA	3.168	70	2 3	0,5	0,5		7	7				0	2
- KILIMA-HEWA	400	0	3	3			0	0	0	0	0	0	0
- NAMAMBI JUU	400	0	3 2	1	0,5		1	1				0	2
- MALAMBWANJI MTAMA	513	0	3	8			0	0	0	0	0	0	0
- LILALA	200	0	3	3			0	0	0	0	0	0	0
- MTALALA	200	0	3 2	3	0,5		1	1				0	3
- NAMBELA LIPWIDI	1.333	18	3 2	2	0,5		2	2				0	1
MANGO PACHANNE	1.313	33	2 3	0,5	2		4	4	0	0	0	0	2
Total ward	8.526	163		2,80	0,75	0	15	15	0	0	0		
Total division	16.257	358					35	30	0	5	0		

District : MTWARA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Division : KITAYA													
Ward code: 120201													
KIROMBA													
KIROMBA JUU	1.285	27	1 3	0	8	1	0	0	0	0	0	2	0
- KIROMBA CHINI													
- MIKUMBI	300	0	3	8			0	0	0	0	0	0	0
KIYANGA	962	40	2 3 5	0,5	2		5	5				0	3
- MYAMBO	300	0	3	2			0	0	0	0	0	0	0
- MKAHARA	300	0	3	2			0	0	0	0	0	0	0
MISUFINI	1.211	0	3	8			0	0	0	0	0	0	0
- NACHUMA	400	0	3	8			0	0	0	0	0	0	0
MAYEMBE	2.275	95	1	0		0						2	0
MPAYANI	750	31	4 7	0,5	5	0	0	0	0	0	0	0	0
Total ward	7.783	193		3,22	5,00	1	5	5	0	0	0		
Ward code: 120202													
KITAYA													
ARUSHA CHINI	630	39	1 3	0		1	0	0	0	0	0	2	0
- KIHAMBE	200	0	2 4	0,5	2		2	2				0	3
- ARUSHA JUU	830	0	1 3	0	3	1	0	0	0	0	0	2	0
- NGONJA	344	0	3	3			0	0	0	0	0	0	0
CHAWI	747	42	3 5	3	0,5		0	0	0	0	0	0	0
- NAVIKOLE	451	0	3	3			0	0	0	0	0	0	0
- NGORONGORO	373	0	3	3			0	0	0	0	0	0	0
- MKOMA	495	0	3	3			0	0	0	0	0	0	0
KITAYA	3.859	117	1 2	0	0	0	3	3				2	1
- MCHANJE	356	0	4 7	1,7	1,2	0	0	0	0	0	0	0	0
Total ward	8.285	197		1,72	1,34	2	5	5	0	0	0		

District : MTWARA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	Hand pumps total	suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 120203 MAHURUNGA													
TANGAZO	2.337	111	2	1			12	9	0	3	1	0	3
- MAGOMENI													
- KILAMBO	300	0	2	0,5		0	5	5	0	0	0	0	3
KILOMBERO	985	0	2 7	0,5	0,5		5	2	0	3	0	0	2
KITUNGULI	1.101	6	1 2	0	0,5	1	5	4	0	1	0	1	2
MAHURUNGA	2.085	46	1 2	0	0,5	1	6	2	0	4	0	1	1
- KIYONGO													
KIHIMIKA	788	14	5 2	1	0,5		4	1	0	3	1	0	2
Total ward	7.596	177		0,50	0,50	2	37	23	0	14	2		
Total division	23.669	567					47	33	0	14	2		

Division : MAYANGA

Ward code: 120301 MAYANGA													
KAWAWA	816	26	1 3	0	3	1						3	0
- MBAWALA-CHINI	300	0	1 3	0	2	1						3	0
- NANYATI	200	0	1 3	0	4	1						3	0
- NYENGEDI	300	0	1 3 5	0	1	1						3	0
MKUNWA	1.160	50	6 5 1	0,7		0						1	0
LIKONDE	675	22	6	3,1	0	0						1	0
- LIKONDE GODAUNI													
MSIJUIE	1.165	67	2	0,7			1	1	0	0	0	0	1
Total ward	4.616	165		0,64	2,00	4	1	1	0	0	0		

District : MIWARA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in- suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 120302 NAUMBU													
IMEKUWA	2.029	28	6 5 1	0,7	0,5	0	0	0	0	0	0	1	0
- KISIWAMBE													
- MAWILO													
- NACHIEMBE													
NAMGOGOLI	1.100	40	6 1			0						1	0
- LISOHO													
- KISIWA	400	20	2 6 1	3	3	0	2	2	0	0	2	1	1
NAUMBU	1.699	281	6 1	2,7	0	0	0	0	0	0	0	1	0
- KITOPE													
- SANGWANGE													
- MWITA PWANI													
- PEMBA PWANI													
- MKUNGU													
- KABISELA	600	578	1	0		0						1	0
MGAO	906	167	1	0		0						1	0
Total ward	6.734	1.114		1,28	1,17	0	2	2	0	0	2		
Total division	11.350	1.279					3	3	0	0	2		

District : MTWARA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	Dist. to W/S 2.	Piped W/S in oper.	Hand pumps total	Hand pumps suff.	Hand pumps in-suff.	Hand pumps sea-son.	Hand pumps salty	Service level piped W/S	Service level hand pump
Division : MPAPURA													
Ward code: 120401													
KITERE													
LIBOBE	845	94	2 4 1	0,5	0,5	0	13	7	0	0	6	1	2
- MING'WENA	907	90	5 2	2	2	0	1	0	1	0	0	0	1
- MITUPA	486	6	7	0,5		0	0	0	0	0	0	0	0
NAMUHI	2.298	103	4 1		0	0	0	0	0	0	0	1	0
- MNYILJA		49	6	2		0	0	0	0	0	0	0	0
CHEMCHEM	1.509	250	1 5 4	1	3	1	0	0	0	0	0	2	0
- LILIDO													
- KITUNGURU	352	6	6 1	1		0	0	0	0	0	0	2	0
- HAMBONI	485	12	6	2		0	0	0	0	0	0	0	0
CHEKELENI	2.418	90	7 4 1	7	12	0	0	0	0	0	0	2	0
- NAKADA	700	33	5 1	0,3		0	0	0	0	0	0	2	0
- MKONYE	850	12	5			0	0	0	0	0	0	0	0
Total ward	10.850	745		1,81	3,50	1	14	7	1	0	6		
Ward code: 120402													
MPAPURA													
MBUO	1.589	67	2 3 1 4	0,5	0	0	3	1	0	0	2	1	1
- CHANGARAWE													
NDUMBWE	2.525	82	2 3 1	0	0	0	3	1	0	0	2	2	1
- NDAMBI													
UTENDE	926	28	1 2	0	1	0	7	7				1	3
- NANYANI	121	8	6			0	0	0	0	0	0	0	0
- MABATINI													
MPAPURA	2.018	23	4 6 1	0,5	0,5	0						1	0
- MNANJE	1.000	0	2	0,5			6	6				0	3
MWETEHI	1.161	20	2			0	10	10	0	0	0	0	3
- MNYUNDO													
Total ward	9.340	228		0,30	0,38	0	29	25	0	0	4		
Total division	20.190	973					43	32	1	0	10		

District : MTWARA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	insuff.	season.	salty	Service level piped W/S	hand pump
Division : NANYAMBA													
Ward code: 120501													
MTINIKO													
MISANJE	1.050	18	6 8	2	0	0	0	0	0	0	0	0	0
- NANYEDYA													
MARANJE	1.383	39	3	3			0	0	0	0	0	0	0
MTINIKO	2.130	52	3 1		0	0	0	0	0	0	0	1	0
- MALAMBA	300	0	6	3		0	0	0	0	0	0	0	0
MBAMBA KOFI	1.360	3	3	8			0	0	0	0	0	0	0
- MNIVATA	300	26	3	3			0	0	0	0	0	0	0
MTIMBWILIMBWI	2.752	24	5 3		4		0	0	0	0	0	0	0
- MTOPWA	300	21	3	2			0	0	0	0	0	0	0
- PACHANI	300	0	3	8			0	0	0	0	0	0	0
Total ward	9.875	182		4,14	1,13	0	0	0	0	0	0		

District : MIWARA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	Hand pumps total	suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 120502 NANYAMBA													
MNONGODI	1.223	0	1 3 4	0	1,5	1	0	0	0	0	0	3	0
- KIWENGURU	389	0	3 4	1	4		0	0	0	0	0	0	0
- LIKWAYA	388	0	1 3	0	2	1	0	0	0	0	0	3	0
MNYAHI	783	35	1 3	0	3	1	0	0	0	0	0	3	0
MILANGOMINNE	1.376	36	1	0		1						3	0
MNYAWI SOKONI	750	35	1 3	0	7	1	0	0	0	0	0	3	0
- MNYAWI BARABARANI	414	0	1 3	0	7	1	0	0	0	0	0	3	0
- MNYAWI SHULENI	334	0	1 3	0	7	1	0	0	0	0	0	3	0
MWANGANGA	776	0	3				0	0	0	0	0	0	0
- MAGOMENI	300	0	3	3			0	0	0	0	0	0	0
MBEMBA LEO	1.103	21	3	4			0	0	0	0	0	0	0
- MILAMBA	300	13	3	4			0	0	0	0	0	0	0
NANYAMBA	1.522	65	1 5	0	5	1	0	0	0	0	0	3	0
- MIBOBO	300	17	1 3 2	0	5	0	1	1	0	0	0	3	2
DINYECHA	4.292	46	1 5	0	1,5	1	0	0	0	0	0	3	0
NAMAKUKU	1.841	65	1 2 5	0	0,5	1	3	3	0	0	0	3	1
- NAMAYANDA	300	68	2	0,5			2	2	0	0	1	0	3
CHIKWAYA	999	38	1 3	0	5	1	0	0	0	0	0	3	0
- MITANGANI	300	24	1 5	0	3	1	0	0	0	0	0	3	0
NAMTUMBUKA SOKONI	2.678	109	1 3	0	7	1	0	0	0	0	0	3	0
- KILIMA-HEWA	242	0	3 4		8	0	0	0	0	0	0	0	0
- MACHEHE	215	0	1 3		0	0	0	0	0	0	0	2	0
- NAMTUMBUKA SHULENI	478	0	1 3	0	7	1	0	0	0	0	0	3	0
Total ward	21.303	572		0,63	4,32	14	6	6	0	0	1		
Ward code: 120503 NITEKELA													
NITEKELA	1.273	69	2 3	0,5			5	5	0	0	0	0	2
- MIULE	270	0	2 5	1,5	1,3	0	1	1	0	0	0	0	1
- CHIWILA	300	0	6									0	0
NYUNDO	1.701	54	2 3 5	0,5	4		5	2	1	2	0	0	2
- MIYUMBA	300	13	3 5	4	4		0	0	0	0	0	0	0
KITAMA BONDENI	915	29	6									0	0
MIGOMBANA	701	0	2 3 5		8		3	3				0	3
Total ward	5.460	164		1,63	4,33	0	14	11	1	2	0		

District : MIWARA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 120504 NJENGWA													
CHIWINDI	840	0	6									0	0
NARUNGA	861	32	3	3		0	0	0	0	0	0	0	0
NJENGWA	1.521	47	2 3	1	1		4	1	0	3	0	0	2
- MAJENGO	550	0	2 3	1			5	5	0	0	0	0	3
NANGAWANGA	498	0	3 2	1,5	0,5		2	2	0	0	0	0	3
- MALONGO	402	0	2 3	0,5	2,5		1	1	0	0	0	0	2
HINJU	1.600	14	2 3	0,5	1		2	2	0	0	0	0	1
- MTULI NJENGWA	211	0	2 5	0,5	1	0	2	2	0	0	0	0	3
Total ward	6.483	93		1,14	1,20	0	16	13	0	3	0		
Total division	43.131	847					36	30	1	5	0		

District : MTWARA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	Dist. to W/S 2.	Piped W/S in oper.	Hand pumps total	Hand pumps in- suff.	Hand pumps sea- son.	Hand pumps salty	Service level piped W/S	Service level hand pump
Division : ZIWANI												
Ward code: 120601 NALINGU												
NALINGU	923	0	2 3	0,5			5	5	0	0	0	3
- MNAZI	300	0	6 2	0,5			2	0	0	2	0	1
- MNETE	482	0	6 2	1,5	0,5	0	2	0	0	2	0	1
MNAWENE	1.160	0	2 6	0,5			4	4	0	0	0	2
MSIMBATI	2.161	65	2	0,5			8	8	0	0	0	2
- RUVULA												
MSANGAMKUU	2.217	36	3 6 1	0		0	0	0	0	0	2	0
- NNOMO												
- NAMELA												
- MAPUNJE												
SINDE	1.077	63	6 3 1	0,3		0	0	0	0	0	2	0
- NG'WALE												
KILIMBI	558	0	6				0	0	0	0	0	0
- MKUBIRU	300	0	6 2		0,5		2	0	0	0	2	0	1
MNGOJI	693	60	2 1	0,5	0		3	2	0	0	1	2	2
- HYUVI	250	0	3								0	0
Total ward	10.121	223		0,54	0,33	0	26	19	0	4	3	
Ward code: 120602 NANGURUWE												
MAKONJELE	676	17	5 2 1	1	0,5	0	5	5	0	0	0	1	3
- NACHENJELE	300	0	2	0,5			5	5				0	3
- CHIMBINDU	117	0	2	0,5			1	1	0	0	0	0	3
- MAKOME A	190	0	2	0,5			3	3	0	0	0	0	3
- MAKOME B	117	0	2	0,5			2	2	0	0	0	0	3
MBAWALA	1.550	270	2 5 1	0,5		0	8	8	0	0	0	1	3
NAMAYAKATA	1.654	31	6	1			0	0	0	0	0	0	0
NANGURUWE	2.090	39	2 6 5 1	1	1	0	7	5	2	0	0	1	2
MDUWI	744	15	1 3	0	2	1	0	0	0	0	0	3	0
- MAILI-KUMI	300	6	1 3	0		1	0	0	0	0	0	3	0
Total ward	7.738	378		0,55	1,17	2,00	31	29	2	0	0		

District : MTWARA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	Hand pumps total	suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 120603 ZIWANI													
ZIWANI	2.470	30	2 1 5	0,5	0	1	10	10	0	0	0	2	3
- NAMBELETEKELA													
- MSAKALA													
MNYEMBE	1.320	58	2	0,5			16	14	2	0	2	0	3
- MOMA	500	0	2	0,5			7	7				0	3
- DING'WIDA	300	0	2	0,5			3	3				0	3
- MIHURU	300	0	2	0,5			6	6				0	3
LITEMBE	1.774	47	2	0,5			4	4	0	0	0	0	2
- LITEMBE PACHANI													
- MITAMBO PATAKUWA													
MADIMBA	1.565	27	2 1	0,5	0	0	6	6	0	0	0	2	3
- MCHEPA													
MTENDACHI	1.120	10	1 2	0	0,5	0	2	2				2	1
- NAMINDONDI	300	0	2 1	0,5			1	1				2	2
Total ward	9.649	173		0,44	0,17	1	55	53	2	0	2		
Total division	27.508	774					112	101	4	4	5		
Total district	142.105	4798					261	229	6	28	15		

13 NEWALA DISTRICT

Divisions		Wards	
01	Newala	01	Luchingu
		02	Makote
		03	Nanguruwe
		04	Mkunya
		05	Mcholi
		06	Namiyonga
		07	Mnekachi
		08	Chitekete
02	Chilangala	01	Mnyamba
		02	Chilangala
		03	Mkoma II
03	Kitangari	01	Kitangari
		02	Malatu
		03	Mchema
		04	Mtopwa
		05	Chiwonga
04	Litehu	01	Luagala
		02	Ngunja
		03	Mkwiti
		04	Mkonjowano
05	Mahuta	01	Mahuta
		02	Mcholi II
		03	Mkundi
		04	Mnyawa
		05	Lukokoda
		06	Nanhyanga
		07	Mdimba
		08	Chingungwe
		09	Makukwe
		10	Mkwedu
06	Namikupa	01	Namikupa
		02	Tandahimba
		03	Kitama
		04	Mihambwe
		05	Michenjele
		06	Mkoreha
		07	Naputa
		08	Maundo

District : NEWALA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Division : NEWALA													
Ward code: 130101													
LUCHINGU													
NEWALA TOWN	0	90	1 3 8	0	5	0	0					2	0
- LUCHINGU	2.600	0	1 3 8	0	6	0	0					2	0
- MAJENGO	4.600	0	1 3 8	0	5	0	0					2	0
- NANGAWALA	5.370	0	1 3 8	0	5	0	0					2	0
- JULIA	1.475	0	1 3 8	0	4,5	0	0					2	0
- KILIMAHEWA	610	0	1 3 8	0	4,5	0	0					2	0
- LINGANA	0	6	1 3 8	0	4,5	0	0					2	0
- LIKUNA	2.225	6	1 3 8	0	4,5	0	0					2	0
- LEKANELO	0	0	1 3 8	0	7	0	0					2	0
- KIDUNI	654	1	1 3 8	0	7	0	0					2	0
- LEGEZA	554	17	1 3 8	0	5	0	0					2	0
- TUPENDANE	0	0	1 7 6 8	8	4,5		0					2	0
- AMKENI	1.700	36	1 7 6 8	8	4,5	0	0					2	0
- TWENDEPAMMOJA	3.620	0	7 3 1 8	9	5	0	0					2	0
MONEKA	1.058	21	3 8 1	1,5	0	0	0					2	0
- MWANONA	293	23	7 6	2	0,9		0					0	0
CHITANDI	919	0	7 6 8	8	4,5		0					0	0
Total ward	25.678	199		2,15	4,55	0	0	0	0	0	0		

District : NEWALA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 130102 MAKOTE													
KIPIMI	1.036	3	1 7 8	0	15,5	1	0	0	0	0	0	3	0
CHIKWAYA	1.255	86	3 8 1	12	0							2	0
KIKUYU	0												
- MNAZIMMOJA	1.002	44	1 3 8	3,5	6	0	0					1	0
- TEMEKE	766	18	1 3 8	5,5	4	0	0					1	0
MAKONDEKO	2.307	118	1 7	0	7	0						3	0
MAHUMBIKA	1.439	74	3 1 8	5	4	0	0					1	0
MAKOTE	2.135	110	7 1	4	0	0						3	0
Total ward	9.940	453		4,29	5,21	1	0	0	0	0	0		
Ward code: 130103 NANGURUWE													
MAPILI	550	26	6 1	0,5	3							1	0
MNANJE	1.034	50	7 8	3	0							0	0
MTAWE A	901	52	7 3 3	9	5							0	0
- MTAWE B	600	31	7 3 8 1	10	6	0						1	0
SAMORA JUU	1.000	54	7 8 1	7	0	0						1	0
- SAMORA CHINI	170	2	7 8 1	7	0	0						1	0
NANGURUWE	1.235	109	7 8 1	10	0	0						2	0
- SONGAMBELE	225	10	7 8 1	9	0	0						2	0
MAGUMCHILA	1.300	62	7 1	3	0	0						2	0
Total ward	7.015	395		6,50	1,56	0	0	0	0	0	0		

District : NEWALA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S			Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps in suff.	in- suff.	sea- son.	salty	Service level piped W/S	hand pump
Ward code: 130104 MKUNYA															
KIUTA	1.100	41	3	8	1	12	0	0						1	0
MKUNYA	1.300	98	7	1		4	0	0						2	0
RAHALEO	1.700	64	7	1		4	2	0						1	0
MATOKEO	0														
- TUVENE	1.012	90	7	8	1	7	0	0						2	0
CHIHANGA	1.255	66	7			0,8								0	0
Total ward	6.367	359				5,56	0,50	0	0	0	0	0	0		
Ward code: 130105 MCHOLI															
CHIUNJILA	500	26	7			1								0	0
- MPILIPILI	621	58	7			0,5								0	0
- CHIKWEDU	402	33	7			1								0	0
CHIHWINDI	2.660	185	3	8	1	15	0	0						2	0
MCHOLI GODAUNI	2.690	88	7	8	1	8	0	0						1	0
AMANI-MCHOLI	1.794	33	7	1		5	0	0	0					2	0
- MNALALE	520	88	7	1		7	0	0	0					2	0
PACHOTO	1.700	22	7	1		12	0	0	0					2	0
Total ward	10.887	533				6,19	0	0	0	0	0	0	0		

District : NEWALA

	Popul- ation 1984	Live- stock units 1984	Exist- ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps in suff.	in- suff.	sea- son.	salty	Service level piped W/S	hand pump
Ward code: 130106 NAMIYONGA													
MANDUMBA	1.000	105	3 8	15	0							0	0
- LONDO	499	116	3 8	15	0							0	0
NAMIYONGA	1.737	54	3 1 8	7	2							1	0
NAKACHELA	1.500	78	3 8	12	0							0	0
MAGOMBO SHULENI	1.512	57	3 8	10	0		0					0	0
- MAGONBO BARABANI	870	104	3 8 1	15	0	0						0	0
Total ward	7.118	514		12,33	0,33	0	0	0	0	0	0		
Ward code: 130107 MNEKACHI													
MNAKWEMBE	0												
- NAMBUNGA	1.212	60	7 8	7,5	0	0	0	0	0	0	0	1	0
- MNAMBE	267	0	6 8	10,5	0	0	0	0	0	0	0	1	0
- CHIWAMBO	1.000	0	7 8 1	0	0	0	0	0	0	0	0	1	0
NANYONDA	933	0	2 8	15,5	0		2	0	0	2	0	0	1
- NANYUWILA	158	0	2 8	17,5	0		0	0	0	0	0	0	0
KILIDU	945	0	2 8	19,5	0	0	0	0	0	0	0	0	0
MKOMA I	2.541	204	7 8 1	15	0	0						1	0
MTANGALANGA	1.117	38	7 8 1	10	0	0						2	0
MAKONGA	1.968	49	1 8 3	0,5	0	0						2	0
JUHUDI	3.162	39	7 8 3 1	4	0	0	0					1	0
Total ward	13.303	390		10,00	0	0	2	0	0	2	0		

District : NEWALA

	Popul-ation 1981	Live-stock units 1981	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps in- suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 130108 CHITEKETE												
MITAHU	982	60	7 8 1	11,5	0	0	0	0	0	0	1	0
MPALU	544	50	6 8	1,3	0	0		0	0	0	0	0
- LUKOHE	131	3	7 8 1	1,7	0		0	0	0	0	0	0
- MCHAURU	147	0	6 8 1	3	0	0	0	0	0	0	1	0
MNAUKE VIJAMA	460	6	7 8 1	15,5	0	0	0	0	0	0	1	0
CHITEKETE	1.200	52	2 8 1	14	0	0	4	4			1	2
- NANKONDA	600	24	2 8	12	0		4	4			0	0
NAMBUDI	509	78	2 8	18	0						0	0
- MCHANGANI	437	46	2 8	13	0		4	4			0	0
NAKAHAKO	1.328	79	6 8 1	15	0	0					1	0
Total ward	6.338	399		10,50	0	0	12	12	0	0	0	
Total division	86.643	3242					12	12	0	0	0	
Division : CHILANGALA												
Ward code: 130201 MNYAMBE												
IDAMNOLE	1.892	50	7 8	6	0						0	0
HENGAPANO	495	0	7 8	3	0						0	0
- NANGUKU	559	2	7 8	2,5	0		0	0	0	0	0	0
- NACHIPOME	275	1	6 8	4,5	0		0	0	0	0	0	0
MNYAMBE	1.913	0	7 8 1	7,5	0	0	0	0	0	0	1	0
MNAYOPE	2.001	40	7 8 1	7,5	0	0	0	0	0	0	1	0
MNIMA	1.100	390	7 8 1	7,5	0	0	0	0	0	0	1	0
CHIHANGU	2.231	50	1 8	7,5	0	0	0	0	0	0	1	0
LIKANGARA	15	0	1 2 8	3,5	11,5	0	4	4	0	0	1	1
BAHATI	449	0	1 2 8	7,5	11,5	0	0	0	0	0	1	0
MAJEMBE JUU	422	2	7 6 8	7,5	7,5		0	0	0	0	0	0
Total ward	11.390	535		5,86	2,77	0	4	4	0	0	0	

District : NEWALA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S		Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps in- suff.	sea- son.	salty	Service level piped W/S	hand pump
Ward code: 130202													
CHILANGALA													
NANYAMBA	100	0	7	8 1	8	0	0					1	0
- MKUDUMBA	493	1	7	8 1	11,7	0	0	0	0	0	0	1	0
- NANDIMBA	717	32	7	8 1	4,2	0	0	0	0	0	0	1	0
- MNYENGACHI	191	4	7	8 1	11,5	0	0	0	0	0	0	1	0
MIYUYU	547	20	6	4 8 1	1,2	4,5	0	0	0	0	0	1	0
CHILANGALA													
SHULENI	1.018	370	6	8 1	7,5	0	0	0	0	0	0	1	0
- NAWANGA	406	2	7	8 1	17,5	0	0	0	0	0	0	1	0
MKONGI	2.402	22	6	8 1	18,5	0	0	0	0	0	0	1	0
NAMANGUDU	490	0	6	8	16,5	0		0	0	0	0	0	0
MIKUMBI	1.600	42	7	8 1	15,5	0	0	0	0	0	0	1	0
Total ward	7.964	493			11,21	0,45	0	0	0	0	0		

District : NEWALA

	Popul- ation 1984	Live- stock units 1984	Exist- ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps in- suff.	sea- son.	salty	Service level piped W/S	hand pump
Ward code: 130203 MKOMA II												
MLINGANE	1.800	40	6 8	10	0						0	0
- NANGUDYANE												
- MKOMA SOKONI												
- LIHANGA												
MMALACHI	2.085	20	6 8	10	0	0					1	0
- MKOMA SHULENI												
- CHILENDE												
- MAHOHA												
LOACHINU	1.000	40	6 8	10	0						1	0
- NAMIHONGA												
- LUKUNGU												
- CHIKALULE												
NAMBALI	1.598	0	6 8	10	0	0					1	0
Total ward	6.483	100		10,00	0	0	0	0	0	0	0	
Total division	25.837	1.128					4	4	0	0	0	

District : NEWALA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	Dist. to W/S 2.	Piped W/S in oper.	Hand pumps total	Hand pumps in suff.	Hand pumps in suff.	Hand pumps sea-son.	Hand pumps salty	Service level piped W/S	Service level hand pump
Division : KITANGARI													
Ward code: 130301													
KITANGARI													
MMOVO	800	110	1 6 8	0	3	1						3	0
NANDA	923	140	1 8	0	0	1						3	0
MIKWANGA	0												
- MITANGA	400	22	3 8	7	0							0	0
- LIKWAYA	299	17	3 8	7	0							0	0
MANDALA	1.151	134	1 8	1	0	1						2	0
- MITEMA													
- NANKONDA													
- MTOPOLA													
MAPUTI	1.500	135	1 3 8	0	1	1						3	0
NIAMOJA	700	73	1 6 8	2,5	5	1						2	0
- MINGALIE	337	0	1 6 8	2,5	6	1						2	0
KITANGARI (MAJENGO)	1.787	120	1 2	0	0	1	7	7				3	2
MTONGWELE	1.400	120	1	0		1						3	0
MNAUYA	713	60	6	2								0	0
KADENGWA	552	60	1 6	0	1	1						3	0
Total ward	10.562	991		1,83	1,60	9	7	7	0	0	0		
Ward code: 130302													
MALATU													
MKUNJO	0	60										0	0
- MALATU SHULENI	761	60	2 3 8	1,2	1,2	0	0	0	0	0	0	0	1
- DODOMA	520	0	2 3 8	1,2	1,2	0	0	0	0	0	0	0	1
- MTANDA	476	0	2 3 8	2,5	2,5	0	0	0	0	0	0	0	0
MALATU	1.500	60	2	0,5			5	5				0	3
MNOLELA CHINI	1.209	60	2	0,5			6	6				0	3
- MNOLELA JUU	216	0											
Total ward	4.682	240		1,18	1,63	0	11	11	0	0	0		

District : NEWALA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	Hand pumps total	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 130303 MCHEMO												
MCHEDEBWA	1.300	44	1 8	7	0						0	0
- MKUPETE	286	24	1 8	5	0						1	0
CHIULE	1.104	102	1 8	7	0						0	0
- MCHEMO A	1.118		8								1	0
LENGO	1.370	60	1 8	7	0	1					0	0
MPWAPWA	927	0	2 1	0	2,5	1	5	5			1	3
SONGAMBELE CHINI	667	0	1 8	6	0	1					0	0
- SONGAMBELE JUU	320	0									1	0
MCHEMO	983	0	2 1	0,5	1	0					2	2
MDIMBA	680	60	6 8 1	6	0	0					1	0
- NGALU	568	0									1	0
MINJALE B	509	0	2 1	0,5		0	2	2			1	2
- MINJALE A	223	0									1	0
CHITENDA	989	0	2	0,5		0	2	2			1	2
Total ward	11.044	290		3,95	0,44	3	9	9	0	0	0	
Ward code: 130304 MTOPWA												
MNYEU	1.850	54	1 8 5	0	0	1					3	0
- CHIKWAYA												
CHILONDOLO	702	62	1 8 6	0	0	1					3	0
CHIKUNDA	473	102	1 8 6	0	0	1					3	0
MTOPWA	2.210	170	1 6	0	0	1					3	0
Total ward	5.235	388		0	0	4	0	0	0	0	0	

District : NEWALA

	Popul- ation 1984	Live- stock units 1984	Exist- ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps in- suff.	sea- son.	salty	Service level piped W/S	hand pump
Ward code: 130305 CHIWONGA												
MZUNGUKA	300	20	1	0		1					3	0
- CHIKUNDA LUBEBO	359	22	1 7 6 8	0	10	1					3	0
- MPILANI	347	27	1 6 8	0	12	1					3	0
- VIHOKOLI	411	20	1 6 8	0	12	1					3	0
NANDWAHI	1.467	190	1 6 8	0	15	1					3	0
CHIWONGA	698	132	6 8	11	0	0					1	0
- PACHANNE	739	22	6 8	11	0						0	0
- CHIWINDI	430	1	6 8	11	0						0	0
- CHIKUTI	548	17	6 8	10	0						0	0
MMULUNGA	776	70	1 8 6	9	0	1					1	0
- ZIARANI	577	33	1 6 8	9	0	1					1	0
MZALENDO	1.036	26	1 8 6	0	0	1					3	0
- MBEMBERE	334	70	1 6	0,5	9	0					1	0
- CHIPITO	320	40	1	2		1					2	0
Total ward	8.342	689		4,54	4,83	9	0	0	0	0	0	
Total division	39.865	2.598					27	27	0	0	0	

District : NEWALA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	Dist. to W/S 2.	Piped W/S in oper.	Hand pumps total	Hand pumps in-suff.	Hand pumps sea-son.	Hand pumps salty	Service level piped W/S	Service level hand pump
Division : LITEHU												
Ward code: 130401 LUAGALA												
MONGOMONGO	659	44	1 5	0	11	1					3	0
- MKWEDU	504	0	1 5	0	7,5	1					3	0
- MACHEDI	413	46	1 5	0	2,5	1					3	0
CHAUME A	1.602	76	1 8	0	0	1					3	0
- CHAUME B	190	3	1 8	3,5	0	1					2	0
- LIPONDE	423	0	1	0		1					3	0
MWERU	1.075	68	1 5	0	1	1					3	0
MICHINJI	1.949	154	1 8 6	0	0	1					3	0
LITEHU	1.388	74	1 5	0	3,5	1					3	0
MKOLA	1.417	120	1	0		1					3	0
KULYENDA	1.284	80	1	4		1					1	0
- MABETI												
- CHIDEDE												
MMEDA	884	0	1	6		1					0	0
LIBOBE	465	0	1 6	3	5	1					1	0
Total ward	12.253	664		1,27	3,39	13	0	0	0	0	0	
Ward code: 130402 NGUNJA												
NAMINDONDI JUU	1.201	414	2 3 1	1	1	0	2	0	2	0	1	1
- NAMINDONDI CHINI	500	0	2 1 3	0	0	0	2	1	1		1	2
MKUNJANGO	0											
- MANGOMBAYA	650	56	7 8 1	10	0	0					1	0
- NANJANGA	332	23	7 8	9	0						0	0
- MKUTI	856	47	1 8	4,5	0	0					0	0
NGUNJA	1.676	86	8 7	0	11						0	0
NANNALA	754	97	8 5	0	7						0	0
Total ward	5.969	723		3,50	2,71	0	4	1	3	0	0	

District : NEWALA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 130403 MKWITI												
LIKOLOMBE												
CHINI	1.891	364	6	0,4							0	0
- KIDOO	340	16	6	0,5							0	0
- LIKOLOMBE JUU	225	0	6	1							0	0
MKWITI A	1.180	112	4 8	7,5	0						0	0
- MKWITI B	508	70	4 8	8	0						0	0
Total ward	4.144	562		3,48	0	0	0	0	0	0	0	
Ward code: 130404 MKONJOWANO												
MKONJOWANO	485	14	1 5 8	0	7,5	1					3	0
- ULODA LEO	424	16	1 8 6	7	0	1					0	0
- NAMBUTUKA	263	34	1 8	3	0	1					2	0
NACHUNYU	728	147	1 5 8	0	7,5	1	0				3	0
MKULA	420	53	1 6 8	7	15	1					0	0
- MKUYU	388	43	1 6 8	7	12	1					0	0
CHIMBO	751	62	1 8 5	0	0	1					3	0
- CHEWONDA	214	23	1 5 8	0	1,5	1					3	0
NAMBAPU	1.125	153	1 3 5	0	0	1					3	0
- MAHOHA	293	49	1 8 6	7	0	1					0	0
MIVANGA	565	16	1 6 8	0	3,5	1					3	0
- MNAIDA	126	6	6 1	2	4	1					2	0
MWEMBEMMOJA	791	21	1 5 8	0	0,5	1					3	0
LYENJE	748	26	1 5	0	0,5	1					3	0
Total ward	7.322	679		2,36	3,71	14	0	0	0	0	0	
Total division	29.688	2.628					4	1	3	0	0	

District : NEWALA

	Popul-ation 1981	Live-stock units 1981	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	Hand pumps total	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Division : MAHUTA												
Ward code: 130501 MAHUTA												
MAHUTA	15.760	338	7 8 1	2	0	0					1	0
- MKULUNGULU												
- CHIKONGOLA												
- BONDENI												
LIDUMBE-MTONI	848	70	7 1	3	0	0					1	0
MILUMBA (JUU)	801	70	1 8	8,5	0		0	0	0	0	0	0
- MILUMBA CHINI	103	0	3 1 8	9,5	13		0	0	0	0	0	0
NAKAYAKA A	407	80	1 6	0	1,2	1	0	0	0	0	3	0
- NAKAYAKA B	323	0	1 6	0	1,7	1	0	0	0	0	3	0
- NAKAYAKA C	201	0	1 6	0	2,5	1	0	0	0	0	3	0
LUBANGALA	1.523	240	1 3 6	0	4	1	0	0	0	0	3	0
Total ward	19.966	798		2,88	2,80	4	0	0	0	0		
Ward code: 130502 MCHOLI												
LIDUMBE SHULENI	1.477	161	3 8 1	5,5	0	0					1	0
MNAIDA	1.167	30	3 8 1	8	0	0					1	0
MSILILI	1.900	84	7 8 1	7	0	0					1	0
- MITUMBATI	600	120	7 8 1	7							1	0
TAWALA	1.979	129	3 8 1	8	0	0					1	0
Total ward	7.123	525		7,10	0	0	0	0	0	0		

District : NEWALA

	Popul- ation 1984	Live- stock units 1984	Exist- ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps in- suff.	sea- son.	salty	Service level piped W/S	hand pump
Ward code: 130503 MKUNDI												
MIKUNDA	2.327	63	1 3 6	0		1	0	0	0	0	3	0
CHITOHOLI	1.198	65	1 3 7	0		1	0	0	0	0	3	0
DINEMBO	1.343	42	1 3 4	0		1	0	0	0	0	3	0
LIPALWE	1.475	50	6 5	0,4	0,2		0	0	0	0	0	0
- LIPALWE II	1.117	50	5	0,2			0	0	0	0	0	0
Total ward	7.460	270		0,12	0,20	3	0	0	0	0	0	
Ward code: 130504 MNYAWA												
MAHEHA	999	51	1 3 4	0		1	0	0	0	0	3	0
PACHANI	805	50	6	0,3			0	0	0	0	0	0
MCHICHIRA	2.352	90	1 3 8	0		1	0	0	0	0	3	0
MNYAWA	1.472	64	1 3 4	0		1	0	0	0	0	3	0
SHANGANI	1.633	40	1 3 4	0		1	0	0	0	0	3	0
JANGWANI	2.216	40	1 3 4	0		1	0	0	0	0	3	0
MUNDAMKULU	1.553	40	1	0		1					3	0
Total ward	11.030	375		0,04	0	6	0	0	0	0	0	
Ward code: 130505 LUKOKODA												
GHANA	1.450	44	1 3 6	0		1	0	0	0	0	3	0
LUKOKODA	1.800	69	1 3 6	0		1		0	0	0	3	0
MNAZIMMOJA	1.620	46	1 3 6	0		1	0	0	0	0	3	0
Total ward	4.870	159		0	0	3	0	0	0	0	0	

District : NEWALA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	Hand pumps total	in-suff.	sea-suff.	son.	salty	Service level piped W/S	hand pump
Ward code: 130506 NANYANGA													
NANYANGA	3.329	145	1 8 5	0	0	1						3	0
NAMDOWOLA	347	45	6 8 5	4	0							0	0
DINDUMA													
BARABARANI	502	97	1 8	0	0	1						3	0
- TANDIKA	243	51	1 8	0	0	1						3	0
- DINDUMA SHULENI	241	63	1 8	2	0	1						2	0
MITENE	1.400	196	1 8	0	0	1						3	0
- MNALWAYO	173	60	8 1	0	1	0						2	0
NANYUWILA	816	90	1	0		1						3	0
MIULE	1.826	130	1	0		1						3	0
Total ward	8.877	877		0,67	0,14	7	0	0	0	0	0		
Ward code: 130507 MDIMBA-MNYOMA													
TUKURU JUU	1.727	110	1 8	0	0	1						3	0
- TUKURU CHINI	289	25	1 8	0	0							3	0
MNYOMA	2.345	85	1 8	0	0	1						3	0
MAMBAMBA	1.604	85	1 5 8	0	1,5	1						3	0
MTANDAVALA	642	70	1 8 5	0	0	1						3	0
-MNAUYA	383	59	1 5 8	0	11	1						3	0
MNDUMBWE	1.179	102	1 8	0	0	1						3	0
- MIYATULA	169	64	1 8	0	0	1						3	0
MTEGU	1.242	120	1	0		1						3	0
Total ward	9.580	720		0	1,56	8	0	0	0	0	0		

District : NEWALA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	Hand pumps total	suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 130508 CHINGUNGWE													
MKUPETE	1.550	106	1 8	0	0	1						3	0
MTENDA	978	90	8 1	0	5	1						1	0
SALAMA	100	0	1	0		1						3	0
- CHIKUNDA	496	79	1 8	0	0	1						3	0
- MALANJE	323	60	1 8	0	0	1						3	0
- KIULE	450	36	1 8	0	0	1						3	0
CHINGUNGWE	2.555	155	1 8	0	0	1						3	0
Total ward	6.452	526		0	0,83	7	0	0	0	0	0		
Ward code: 130509 MAKUKWE													
MNACHI	100	0	1	0		0						1	0
- MTENDACHI	809	1	1 8 1	2,5	0	0						1	0
- MNAUJA	774	68	1 8 1	3,5	0	0						1	0
MTUNGURU	3.721	609	1 8 1	7,5	0	0						1	0
MMONGO	0	0											
- MINJALE	292	18	8 1	0	2,5	1						2	0
- MBUYUNI	692	60	8 1	0	3,5	1						2	0
MANGO	0	0											
- MAKUKWE I	983	138	8 1	0	4	1						2	0
- NGONGO	744	105	1 8	0	0	1						3	0
MAKUKWE	1.547	95	3 8 1	4	0	0						1	0
MNAMUNJELELE	1.610	138	3 8 1	9	0	0						1	0
Total ward	11.272	1.231		2,65	1,11	4	0	0	0	0	0		

District : NEWALA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S		Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps in-suff.	suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 130510 MKWEDU														
MNYAMBACHI	1.837	166	3	8	10	0							0	0
MKWEDU	1.405	127	1	8 1	10	0	0						1	0
- CHIUTA	629	55	1	8 1	6,5	0	0						1	0
TENGULENGU	1.328	153	3	8	7	0							0	0
- MAKULE	301	11	8	3	0	14							0	0
Total ward	5.500	513			6,70	2,80	0	0	0	0	0	0		
Total division	92.130	5.994						0	0	0	0	0		

Division : NAMIKUPA

Ward code: 130601 NAMIKUPA														
NAMIKUPA	2.229	20	7	1	1,6	0	0						1	0
PEMBA	1.372	57	6	8 1	1	0	0						1	0
- SINYANGI	105	2	6		3,5								0	0
CHINGATI	1.425	28	1	6 8	0	2	1						3	0
HURUMA	597	43	1	3		1,7	1	0	0	0	0	0	3	0
MILIDU	1.173	80	1	3			1	0	0	0	0	0	3	0
KWANYAMA	1.313	62	3	4	4,5	15,5		0	0	0	0	0	0	0
NANJALAHU	227	2	3	5 4		0,5		0	0	0	0	0	0	0
Total ward	8.441	293			2,12	3,28	3	0	0	0	0	0		

District : NEWALA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	Hand pumps total	suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 130602 TANDAHIMBA													
MAPUNJU	969	65	1 6 8	0		1						3	0
- TINGIDA A													
- TINGIDA B													
MBALALA	635	37	1 6	0	2,5	1						3	0
MAROPOKELO	776	55	1 6	0	1	1						3	0
- MILEDI	221	17	1 6	0	2	1						3	0
NANGOTI	147	16	1 6	2	2,5							3	0
MADABA A	1.530	76	1 6 8	0	2,5	1						3	0
- MADABA B	60	6	1 6	1,5	4	1						2	0
MALAMBA	1.426	108	1 6 8	2	7,5	1						2	0
TANDAHIMBA	3.595	41	1 6	0	1	1						3	0
NAMKOMOLELA	639	0	1 8 5	0	0	0						3	0
MILONGODI	1.283	23	1 5	0	5,5	1						3	0
- MWINDI	400	20	1 8	0	0	1						3	0
- NALYAMBA	123	0	1 8	0	0	1						3	0
Total ward	11.804	464		0,42	2,38	11	0	0	0	0	0		
Ward code: 130603 KITAMA													
NG'ONGOLO	985	100	1 3 6			1	0	0	0	0	0	3	0
- NG'ONGOLO CHINI	182	0	1 6	0	4,7	1	0	0	0	0	0	3	0
MIUTA	1.336	110	1 6 3	0	7,5	1	0	0	0	0	0	3	0
KITAMA	2.345	79	1 6 8	0								3	0
MWENGE	1.859	60	1 6 8	0	4,5	1						3	0
MITONDI A	985	42	1 5 8	0	3,5	1						3	0
- MITONDI C	140	4	8	0								0	0
- MITONDI B	282	36	5	2,5								0	0
Total ward	8.114	430		0,36	5,05	6	0	0	0	0	0		

District : NEWALA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 130604 MIHAMBWE													
MIHAMBWE	1.437	100	1 4 3	0	5,5	1	0	0	0	0	0	3	0
RUVUMA	1.738	80	1 3 4	0		1	0	0	0	0	0	3	0
LEMBELA	0	0											
- NAKALE	250	0	1 3 6	0		1	0	0	0	0	0	3	0
- MNYAHI	735	50	1 3 6	0		1	0	0	0	0	0	3	0
KISAGANI	0	0	1	0									
- MKAHA	653	50	1 3 4	0	4	1	0	0	0	0	0	3	0
- MATENDE	505	0	1 3 4	0	7	1	0	0	0	0	0	3	0
- MITUMBATI	378	0	1 3 4	0	6	1	0	0	0	0	0	3	0
Total ward	5.696	280		0	5,63	8	0	0	0	0	0		
Ward code: 130605 MICHENJELE													
SHIRIKISHO	200	0	1 3 4	0		1						3	0
- MPUNDA	416	50	1 3 4	0	6	1	0	0	0	0	0	3	0
- MMALALA	480	0	1 3 5	0		1	0	0	0	0	0	3	0
NGONGO	855	80	1 4	0	0,5	1	0	0	0	0	0	3	0
MICHENJELE JUU	1.520	80	1 3 4	0	4	1	0	0	0	0	0	3	0
- MICHENJELE CHINI	74	0										3	0
Total ward	3.545	210		0	3,50	5	0	0	0	0	0		

District : NEWALA

	Popul-ation 1981	Live-stock units 1981	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in- suff.	sea- son.	salty	Service level piped W/S	hand pump
Ward code: 130606 MKOREHA													
DINYEKE	430	0	1 3 6	0	3	1	0	0	0	0	0	3	0
- DINYEKE II	390	0	6 1	0,5		0	0	0	0	0	0	2	0
NAMUNDA	2.010	80	1 3 6	0,7		1	0	0	0	0	0	3	0
- MISUFINI	1.100	80	1 3 6	0	7	1	0	0	0	0	0	3	0
MCHANGANI	1.150	0	1 3 6	0		1	0	0	0	0	0	3	0
CHIKONGO	1.178	60	1 3 4	0	3	1						3	0
Total ward	6.258	220		0,20	4,33	5	0	0	0	0	0		
Ward code: 130607 NAPUTA													
MWANGAZA	1.021	60	1 3 6	0		1	0	0	0	0	0	3	0
- MPIKULA	340	0	1 3 8	0,5		1	0	0	0	0	0	3	0
NAMDWANI	727	0	1 3 6	0		1	0	0	0	0	0	3	0
NAPUTA	1.662	80	1 3 6			1	0	0	0	0	0	3	0
Total ward	3.750	140		0,17	0	4	0	0	0	0	0		

District : NEWALA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps in suff.	suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 130608 MAUNDO													
KUNANDUNDU	1.510	60	1 3 4	0		1	0	0	0	0	0	3	0
CHIUMO	100	0	1	0								3	0
- MAKOMBO	700	0	1 3 6	0	5	1	0	0	0	0	0	3	0
- MBUYUNI	262	0	6	3		0	0	0	0	0	0	0	0
- MAUNDO CHINI	300	0	6	0,5		0	0	0	0	0	0	0	0
NAMAHONGO	2.193	60	1 3 4	0	6	1	0	0	0	0	0	3	0
MAUNDO	1.370	0	1 3 6	0,5	5	1	0					3	0
Total ward	6.435	120		0,57	5,33	4	0	0	0	0	0		
Total division	54.043	2.157					0	0	0	0	0		
Total district	328.206	17.347					47	40	3	0	0		

14 MTWARA-MIKINDANI TOWN

Division

01 Mtwara

02 Mikindani

District : MTWARA-MIKINDANI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Division : MTWARA MJINI													
Ward code: 140100													
MAGOMENI	6.000	0	2 3 1	3	1	0	10	1	8	1	0	1	2
MANGOMBA	1.200	0	2				3	3				0	2
NALINDELE	4.100	0	1	0		1	0	0	0	0	0	3	0
MKANGALA	3.150	0	2	1			7	1	5	1		0	1
MBAE	1.100	0	2				4	4	0	0		0	3
MTWARA TOWN	61.300	551	1 2 3	0,5	0,5	1	50	30		20		2	1
Total ward	76.850	551		1,13	0,75	2	74	39	13	22	0		
Division : MIKINDANI													
Ward code: 140200													
MIKINDANI TOWN	11.300	0	1 2				33	20	0	13		2	2
RWELU	1.150	26	2	0,6		0	3	2	1	0	0	0	2
Total ward	12.450	26		0,60	0	0	36	22	1	13	0		
Division : LIKOMBE													
Ward code: 140300													
MTAWANGA	1.300	82	2 1 3			0	3	1	0	2	0	1	1
Total ward	1.300	82		0	0	0	3	1	0	2	0		
Total district	90.600	659					113	62	14	37	0		
Total region	868.280	35.394					848	586	49	211	20		

21 KILWA DISTRICT

Divisions		Wards	
01	Kipatimu	01	Kipatimu
		02	Kandawale
		03	Chumo
02	Njinjo	01	Miguruwe
		02	Mitole
		03	Njinjo
03	Nanjirinji	01	Nanjirinji
		02	Likawage
04	Miteja	01	Kinjumbi
		02	Miteja
		03	Tingi
		04	Mingumbi
05	Pwani	01	Kivinje
		02	Masoko
		03	Songosongo
		04	Kikole
06	Pande	01	Pande-Mikoma
		02	Lihimalyao
		03	Mtandi
		04	Mandawa

District : KILWA

	Popul- ation 1984	Live- stock units 1984	Exist- ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in- suff.	sea- son.	salty	Service level piped W/S	hand pump
Division : KIPATIMU													
Ward code: 210101 KIPATIMU													
HANGA	964	0	2 3 6	2			2	2				0	2
KIPATIMU	4.002	0	2 3 1 6	0	0	2	14	14	0	0	0	0	3
KIBATA	1.143	0	6	3			0					0	0
MTONDO WA KIMWAGA	1.662	0	2 6	0,5	0		7	7				0	3
- MKONGO	300	0	2	0,5			3	3				0	3
MWENGEI	837	0	2 6	0,5	1		0					0	2
NANDEMBO	1.046	0	6	3								0	0
NANDETE	1.907	0	2 6	0,5	1		9	9				0	3
MKARANGO	1.000	0	2 6	0,5			4	4				0	3
Total ward	12.861	0		1,17	0,50	2	39	39	0	0	0		
Ward code: 210102 KANDAWALE													
NAMATEWA	700	0	6									0	0
NGARAMBI	1.750	0	3 6									0	0
MTUMBEI-MPOPERA	1.256	0	4 3									0	0
KANDAWALE	1.731	10	3 6									0	0
Total ward	5.437	10		0	0	0	0	0	0	0	0		

District : KILWA

	Popul- ation 1984	Live- stock units 1984	Exist- ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	Hand pumps total	suff.	in- suff.	sea- son.	salty	Service level piped W/S	hand pump
Ward code: 210103 CHUMO													
CHUMO	3.000	0	2 3	0,5	0,5		10	6	2	2	0	0	2
NAMAYUNI	2.514	0	2 3	0	3		4	3	0	1	0	0	1
KINYWANYU	1.716	0	2 3 7	0	0,5		10	8	1	1		0	3
INGIRITO	1.400	0	3 6	5			0					0	0
Total ward	8.630	0		1,38	1,33	0	24	17	3	4	0		
Total division	26.928	10					63	56	3	4	0		
Division : NJINJO													
Ward code: 210201 MIGURUWE													
MIGURUWE	1.541	0	2 6 3	0	1		7	0	0	7	0	0	2
NAKINGOMBE	1.220	0	2 3				4	4				0	2
ZINGA KIBAONI	600	0	2 3				3	3				0	2
Total ward	3.361	0		0	1	0	14	7	0	7	0		
Ward code: 210202 MITOLE													
MITOLE	1.250	0	3 4		2							0	0
NGEA	620	0	3 6	1,5								0	0
MKOMA	520	0	3 6	0								0	0
Total ward	2.390	0		0,75	2,00	0	0	0	0	0	0		

District : KILWA

	Popul- ation 1984	Live- stock units 1984	Exist- ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in- suff.	sea- son.	salty	Service level piped W/S	hand pump
Ward code: 210203 NJINJO													
NJINJO	3.400	0	2 1	1	0	1	16	16	0	0	0	1	3
KIPINDIMPI	2.015	0	2 3	0	1		5	0	0	5	0	0	1
KISIMA-MKIKA	1.400	0	3 1	5		0						1	0
Total ward	6.815	0		2,00	0,50	1	21	16	0	5	0		
Total division	12.455	0					35	23	0	12	0		
Division : NANJIRINJI													
Ward code: 210301 NANJIRINJI													
NANJIRINJI B	1.500	0	6 1			2	0					0	0
NANJIRINJI A	1.200	5	3 3 1	2	4	1	0					2	0
NAKIU	2.600	0	3 4	2	3	0	0					0	0
Total ward	5.300	5		2,00	3,50	3	0	0	0	0	0		
Ward code: 210302 LIKAWAGE													
LIKAWAGE	2.200	0	3 1	1	0	0	0					1	0
- MBUNJA	370	0	3 6	4	0		0					0	0
NAIKOKWE	485	0	3	1			0					0	0
LIWITI	1.000	0	4	3			0					0	0
Total ward	4.055	0		2,25	0	0	0	0	0	0	0		
Total division	9.355	5					0	0	0	0	0		

District : KILWA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Division : MITEJA													
Ward code: 210401 KINJUMBI													
KIHEMA													
(KINJUMBI)	3.400	40	2 3	0	3		8	8	0	0	0	0	2
MALENDEGO	800	6	2 3	0,5	0		4	4	0	0	0	0	3
SOMANGA NDUMBO	1.793	10	2 3	0,5	3		11	10	0	2	0	0	3
SOMANGA SIMU	810	29	2 3	0	8		5	2	1	1	0	0	2
MTYALAMBUKO	1.506	0	3 4	1			0					0	0
Total ward	8.309	85		0,40	3,50	0	28	24	1	3	0		
Ward code: 210402 MITEJA													
MITEJA	2.900	11	2 3	0	1		6	6	0	0	0	0	2
MTONI	1.710	12	3 6	0	3		0					0	0
MTUKWAO	810	4	3 6	0	2		0					0	0
TILAWANDU	500	4	3	0	1,5		0					0	0
Total ward	5.920	31		0	1,88	0	6	6	0	0	0		
Ward code: 210403 TINGI													
TINGI	2.000	15	1 2 3	0	0	1	6	0	0	6	0	2	1
MTANDANGO	683	30	2 3	0	3		5	5	0	0	0	0	3
NJIANNE	1.300	10	1 6	0	2	1	0					2	0
- MATAPATAPA	200	0	6									0	0
Total ward	4.183	55		0	1,67	2	11	5	0	6	0		

District : KILWA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 210404 MINGUMBI													
MINGUMBI	2.600	26	2 3	0	5		20	11	0	9	0	0	3
KILILIMA	2.100	16	2 3	0	3		1	0	0	1	0	0	1
CHAPITA	1.400	8	2 3	0	3		2	0	0	2	0		
Total ward	6.100	50		0	3,67	0	23	11	0	12	0		
Total division	24.512	229					68	46	1	21	0		
Division : PWANI													
Ward code: 210501 KIVINJE													
KILWA KIVINJE	6.161	30	1 3	0	0	1	0					3	0
SINGINO	3.300	80	4 1	0,5	0	0	0					3	0
- NANKURUKURU	200	0	3 1	1		0	0					1	0
- MATANDU	200	0	4	0			0					0	0
Total ward	9.861	130		0,38	0	1	0	0	0	0	0		
Ward code: 210502 MASOKO													
MASOKO MJINI	7.000	0	1 2	0	0	1	4	4	0	0	0	3	1
MKAWANYULE	713	32	1	0,5		1						3	0
KISIWANI	600	0	3	0,5								0	0
MPARA	600	30	2	0			1	1	0	0	0	3	1
- BANGWE	200	0	3									0	0
- LIPINDI	200	0	3	3								0	0
- MTANGA	200	242	1 3	0	1	0						1	0
Total ward	9.513	304		0,67	0,50	2	5	5	0	0	0		

District : KILWA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 210503													
SONGOSONGO													
SONGOSONGO													
	1.300	0	1 3	0								2	0
Total ward	1.300	0		0	0	0	0	0	0	0	0		
Ward code: 210504													
KIKOLE													
RUHATWE - KISANGI-KIMBAGAMBARA	1.701	45	1 4	0	4	1						2	0
MIGEREGERE	1.132	30	1 3	0	3	0						2	0
KIKOLE	1.600	30	4 3 1	2	2							1	0
Total ward	4.433	105		1,25	3,00	0	0	0	0	0	0		
Total division	25.107	647					5	5	0	0	0		

District : KILWA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps in- suff.	suff.	sea-son.	salty	Service level piped W/S	hand pump
Division : PANDE													
Ward code: 210601													
PANDE MIKOMA													
MIKOMA	2.500	40	3	1								0	0
- NAKIMWERA			3									0	0
MALALANI	1.200	60	3 2	0	0,5		1	0	0	1		0	1
- CHASI												0	0
- SANJAKATI			8	2								0	0
PANDE PLOT	4.000	50	2 3 1	1	2	0	11		11			1	2
- MBILINDINYI			6	2								0	0
- KIHIVA			6	2								0	0
- MPOTOLA			6	2								0	0
- MSITETEME			6	2								0	0
NAMWEDO	1.220	40	2 3	0,5	2		2	2				0	2
- MAKOTE													
- NJENGA			6									0	0
MITITIMIRA	1.310	20	6	1								0	0
NANGOO-KIWALA	1.000	10	6	2								0	0
Total ward	11.230	220		1,41	1,50	0	14	2	11	1	0		
Ward code: 210602													
LIHIMALYOAO													
KISONGO	1.600	38	3 3	0,7	8		0					0	0
LIHIMALYOAO	3.120	34	1 3	0	2	1						2	0
- NGALWE													
- NAMBALOMBE													
- MWEMBE MIUNHI													
RUAYAYA	800	22	3 7	0,9	5							0	0
RUSHUNGI	1.000	10	3	0								0	0
NAMAKONGORO	600	24	1 3	0	0							1	0
Total ward	7.120	128		0,32	5,00	1	0	0	0	0	0		

District : KILWA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 210603 MTANDI													
MAKANGAGA	1.290	0	3	2			3	3				0	2
KIRANJERANJE	2.660	50	1 3	0	0,5		0.					2	0
MBWEMKURU	1.565	40	2 3	0	1		3	1	0	2	1	0	1
KISWERE	910	0	3									0	0
MTANDI	1.300	10	1 2		0,5		3			3		2	2
Total ward	7.725	100		0,67	0,67	0	9	4	0	5	1		
Ward code: 210604 MANDAWA													
HOTELITATU	500	0	3									0	0
MAVUJI	1.614	0	4	1		0						0	0
- MEHAKAMA			4									0	0
MANDAWA	2.250	30	4	0,5			0					0	0
KIWAWA	1.600	0	1 2	0	0,5		4	4				2	2
KINGONGO	500	0	3	0	0,5		0					0	0
Total ward	6.464	30		0,38	0,50	0	4	4	0	0	0		
Total division	32.539	530					27	10	11	6	1		
Total district	130.500	1.421					195	140	15	43	1		

22 LINDI DISTRICT

Divisions		Wards	
01	Ruangwa	01	Ruangwa
		02	Mbekenyera
		03	Makanjiro
		04	Likunja
		05	Narungombe
		06	Namichiga
02	Mnacho	01	Malolo
		02	Mnacho
		03	Nkowe
		04	Luchelegwa
03	Mandawa	01	Mandawa
		02	Nambilanje
		03	Mtondo
04	Mtama	01	Mtua
		02	Mtama
		03	Nyengedi
		04	Nyangao
		05	Namupa
05	Mipingo	01	Mipingo
		02	Kitomanga
06	Nangaru	01	Nangaru
		02	Chikonji
		03	Matimba
07	Milola	01	Milola
		02	Kiwawa
		03	Rutamba
08	Rondo	01	Chiponde
		02	Mnara
09	Mhinga	01	Mbanja
		02	Mchinga
		03	Kilolambwani
10	Ngapa	01	Ngapa
		02	Tandangongoro
11	Mingoyo	01	Mingoyo
		02	Mnolela
		03	Kiwalala
12	Nyangamara	01	Nyangamara
		02	Nahukahuka
		03	Mandwanga
13	Sudi	01	Sudi
		02	Nachunyu

District : LINDI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Division : RUANGWA													
Ward code: 220101 RUANGWA													
RUANGWA	0	0	2 1 3	0	0	1	0	0	0	0	0	2	2
- KILIMAHEWA	1.255	24	1 3	0	6	1						2	0
- NACHINGWEA	1.196	24	2 1 3	0	6	1	6	6				2	2
- DODOMA	1.382	28	2 1 3	0	0	1	4	4	0	0	0	2	2
- LIPANDE	300	0	2 3	0,5	4		3	3	0	0	0	0	3
- MCHANGANI	1.255	100	2 1 3	0,5	0	1	6	3	0	3	0	2	2
MANDARAWE	990	14	2 3	0,5	6		6	6	0	0	0	0	3
NACHINYIMBA	888	24	2 3	0,5	2		3	3	0	0	0	0	2
LIKANGARA	1.223	24	1 3	0	6	1	0					2	0
NANDENJE	870	24	2 3	0,5	2		5	4	0	1	0	0	2
Total ward	9.359	262		0,25	3,20	6,00	33	29	0	4	0		
Ward code: 220102 MBEKENYERA													
NAUNAMBE	2.196	36	3 3	0,5	8	0						0	0
MKUTINGOME	1.287	36	3 2		0,5		3	3	0	0		0	2
NAMIKULO	1.739	36	3 2	0,5	0,5		7	7	0	0		0	3
MBEKENYERA	2.450	86	2 3	0,5	3		12	12	0	0	0	0	2
CHUNYU	1.585	36	2 3	0,5	0,5		9	9	0	0		0	3
NAMILEMA	972	14	3 2	0,5	0,5		8	8	0	0		0	3
Total ward	10.229	244		0,50	2,17	0	39	39	0	0	0		

District : LINDI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.		Hand pumps total	suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 220103 MAKANJIRO														
CHIKOKO	500	0	2	0,5			2	2					0	2
MAKANJIRO	900	24	2 3	0,5	3		4	4	0	0	0		0	3
- CHINOKOLE	303	0	3	6									0	0
- MBANGARA	394	0	3	5									0	0
Total ward	2.097	24		3,00	3,00	0	6	6	0	0	0			
Ward code: 220104 LIKUNJA														
KITANDI	1.926	38	2 3	0,5	3		10	10	0	0	0	0	0	3
LIKUNJA	1.235	38	2 3	0,5	2		10	10	0	0	0	0	0	3
- MPARA	300	0	2 3	0,5	0,5		4	4	0	0	0	0	0	3
- MNAWA	488	0	2 3	0,5			2	2	0	0	0	0	0	3
CHILANGALILE	1.160	24	3 1	6	0	0	0						1	0
- MTIMBO-LINDI	309	0	2 3	0,5	8		3	3	0	0	0	0	0	3
MITOPE	1.063	24	2 3	0,5	0,5		4	4	0	0	0	0	0	2
Total ward	6.481	124		1,29	2,33	0	33	33	0	0	0			
Ward code: 220105 NARUNG'OMBE														
NARUN'GOMBE	1.770	30	2 4	0,5			3	1	0	2			0	1
- NACHIUNGO	500	0	3	3									0	0
LIUGURU	1.557	32	1 2 3	0	0,5		3	3	0	0	0		2	2
MACHANGANJA	946	14	3	6									0	0
Total ward	4.773	76		2,38	0,50	0	6	4	0	2	0			

District : LINDI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in	oper.	Hand pumps total	suff.	insuff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 220106 NAMICHIGA														
MIHEWE	855	10	2 3	0,5				5	3	0	2	0	0	2
MATAMBALALE	1.440	0	3										0	0
NANDANDARA	761	10	3	3									0	0
NAMICHIGA	2.447	36	2 3 1	0,5	6	0		10	3	0	7		1	2
Total ward	5.503	56		1,33	6,00	0		15	6	0	9	0		
Total division	33.442	786						132	117	0	15	0		
Division : MNACHO														
Ward code: 220201 MALOLO														
MICHENGA	1.996	0	2 3	0,5				9	8	0	1		0	3
NANGANGA	959	38	1 2 4	0	0,7	1		4	2	2	0	0	3	2
NANGUMBU	4.223	39	2	0,7				19	19				0	3
MALOLO	1.240	117	2 6	0,7	0,7			6	5	0	1	0	0	2
Total ward	8.418	194		0,48	0,70	1		38	34	2	2	0		
Ward code: 220202 MNACHO														
NGAU	1.750	10	1 3	0		1							3	0
NAMAHEWA	1.313	10	3	5									0	0
NANDAGALA	2.857	20	1 3	0,5		1							3	0
CHIMBILA A	2.375	20	2 3	0,5				4	4	0	0		0	2
- CHIMBILA B	400	0	1 3	0,5		0							2	0
MANOKWE		1	3										0	0
Total ward	8.695	61		1,30	0	2		4	4	0	0	0		

District : LINDI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.		Hand pumps total	suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 220203 NKOWE														
NKOWE	2.691	20	2 3 1	0,5	3	0	5	5	0	0			2	2
KIPINDIMBI	814	10	3 2	0,5	0,5		4	4	0	0			0	3
CHIENJELE	1.658	12	5 3	1,7	1,7								0	0
MIBURE	2.064	40	6	2,5			0	0	0	0	0		0	0
NGIMBWA	507	10	6	0,7		0	0	0	0	0	0		0	0
NAMAKUKU	893	12	2 1	0,5			1	1	0	0	1		0	1
Total ward	8.627	104		1,07	1,73	0	10	10	0	0	1			
Ward code: 220204 LUCHELEGWA														
NANDANGA	1.071	24	4 6	2,5			0	0	0	0	0		0	0
CHINONGWE	2.313	159	4 2	6	3		6	5	0	1	0		0	2
LITAMA	814	167	4 2	9	0,5		3	3	0	0	0		0	2
LUCHELEGWA	850	36	6	3,5			0						0	0
Total ward	5.048	386		5,25	1,75	0	9	8	0	1	0			
Total division	30.788	745					61	56	2	3	1			

District : LINDI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	Dist. to W/S 2.	Piped W/S in oper.	Piped W/S total	Hand pumps suff.	Hand pumps in-suff.	Hand pumps sea-son.	Hand pumps salty	Service level piped W/S	Service level hand pump
Division : MANDAWA													
Ward code: 220301 MANDAWA													
CHIBULA	1.242	20	1 3	0	5	0						1	0
MCHICHILI (MANDAWA)	2.916	84	1 3	0	5	0						3	0
NAHANGA	1.812	23	1 3	0	5	0						3	0
CHIKUNDI	647	20	1 3	0	6	1						3	0
LICHWACHWA	366	20	4 3 1		4	0						1	0
Total ward	6.983	167		0	5	1	0	0	0	0	0		
Ward code: 220302 NAMBILANJE													
MKARANGA	908	35	2 3	0,5	8		6	2	0	4		0	2
NAMBILANJE	878	20	3	3								0	0
NANJARU	789	20	3	3								0	0
Total ward	2.575	75		2,17	8	0	6	2	0	4	0		
Ward code: 220303 MTONDO													
MTONDO	1.147	20	1 3	0		1						3	0
MUHURU	300	0	3 1	5	0	0						1	0
Total ward	1.447	20		2,50	0	1	0	0	0	0	0		
Total division	11.005	262					6	2	0	4	0		

District : LINDI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	Dist. to W/S 2.	Piped W/S in oper.	Hand pumps total	Hand pumps suff.	Hand pumps in-suff.	Hand pumps sea-son.	Hand pumps salty	Service level piped W/S	Service level hand pump
Division : MTAMA													
Ward code: 220401 MTUA													
LONGA	2.053	16	4 1	0	0	0						1	0
MTUA	3.512	39	2 1 4	0,5	0,5	0	10	10	0	0		1	2
Total ward	5.565	54		0,25	0,25	0	10	10	0	0	0		
Ward code: 220402 MTAMA													
MPENDA	1.105	8	2 3	0,5	2		4	1	0	3		0	1
MTAMA	0	0											
- MIHOGENI	2.380	12	2 1	0,5	0	0	5	5				0	2
- MAKONDE	2.813	24	2 1	0,5	0	0	5	5				0	2
- MAJENGO	4.313	26	2 1	0,5	0	0	4	4				1	1
- MASASI	1.517	6	2 1	0,5	0	0	2	2				1	1
NANGAKA	947	4	3									0	0
- CHIGURUWE													
MBALALA	832	4	4 1	0,7	0	0	0	0	0	0	0	1	0
Total ward	13.907	84		0,53	0,33	0	20	17	0	3	0		
Ward code: 220403 NYENGEDI													
MTUMBYA	1.326	11	6									0	0
KILIMANJARO	1.235	4	6	1,5								0	0
LUWALE	870	7	4 3 1		5	0						1	0
NYENGEDI	3.252	12	2 4 1	0,5		0	1	1				1	1
Total ward	6.683	34		1,00	5	0	1	1	0	0	0		

District : LINDI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 220404 NYANGAO													
NAMANGALE	2.414	82	2 6	1,5	1,5		6	6	0	0	0	0	2
NYANGAO	3.201	187	4 2	1	0,5	0	18	16	2	0	0	0	3
MNAMBA	379	24	4	4,5			0	0	0	0	0	0	0
CHIWERERE	674	52	4 2	1,7	1,2		3	1	2	0	0	0	2
MAHIWA	1.270	18	4 6 1	0,7		0	0	0	0	0	0	1	0
MAWILO	365	52	2	2,2			2	2	0	0	2	0	2
Total ward	8.303	415		1,93	1,07	0	29	25	4	0	2		
Ward code: 220405 NAMUPA													
NDAWA	412	2	4	0,7			0	0	0	0	0	0	0
MIHIMA	1.012	6	4	1,2			0	0	0	0	0	0	0
NAMUPA	1.451	68	4 2 7	0,7	0,7		8	8	0	0	5	0	3
Total ward	2.875	76		0,87	0,70	0	8	8	0	0	5		
Total division	37.333	663					68	61	4	3	5		

District : LINDI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Division : MIPINGO													
Ward code: 220501 MIPINGO													
MNYANGARA	1.245	7	4 6									0	0
MATAPWA	1.000	70	2	0,5			12	12	0	0		0	3
MIPINGO	1.410	34	3 1		0	0						1	0
NAMIKONGO	908	5	6 1	1,5	0	0						1	0
LIHIMILO	658	4	6 4									0	0
Total ward	5.221	120		1,00	0	0	12	12	0	0	0		
Ward code: 220502 KITOMANGA													
MKWAJUNI	1.443	4	2 6				1	1	0	0		0	1
KITOMANGA	3.981	12	1 2	0	0,5	0	3					2	1
Total ward	5.424	16		0	0,50	0	4	1	0	0	0		
Total division	10.645	136					16	16	0	0	0		
Division : NANGARU													
Ward code: 220601 NANGARU													
MAKUMBA	420	20	6	1,5			0					0	0
MKUMBAMOSI	1.874	64	6 4	3			0					0	0
MJUNGANO	1.474	40	6	0								0	0
NANGARU	1.329	80	3									0	0
Total ward	5.097	204		1,50	0	0	0	0	0	0	0		

District : LINDI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 220602 MATIMBA													
CHIKONJI - MWIWI	2.753	50	2 1	0		0	12	12	0	0		1	3
NANYANJE	1.217	40	6 1		0	0						1	0
JANGWANI	412	72	6	1,5			0					0	0
Total ward	4.382	162		0,75	0	0	12	12	0	0	0		
Ward code: 220603 CHIKONJI													
LIKWAYA	1.096	22	5									0	0
KIKOMOLELA	1.600	20	2	0			10	10				0	3
MOKA	869	72	2 6	0,5			5	2	5			0	2
MATIMBA	442	10	2	0,5			2					0	3
Total ward	4.007	124		0,33	0	0	17	12	5	0	0		
Total division	13.486	490					29	24	5	0	0		

Division : MILOLA

Ward code: 220701 MILOLA													
NAMTAMBA	926	20	4 1		0	1	0					1	0
MILOLA													
MACHARIKI	2.634	124	2 1				2					2	1
CHIKWIKWI	2.530	154	2 1	0	0							2	1
LEGAZAMWENDO	718	0	4 1	1	0	1	0					1	0
Total ward	6.808	298		0,50	0	2	2	0	0	0	0		

District : LINDI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in- suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 220702 KIWAWA													
KIWAWA	1.354	6	6	1								0	0
MPUTWA	983	65	4	2			0					0	0
Total ward	2.337	71		1,50	0	0	0	0	0	0	0		
Ward code: 220703 RUTAMBA													
RUTAMBA	2.122	28	2 1		0	0	14	14				2	3
RUTAMBA YASASA	3.600	24	2 1		0	0	20	40				2	3
KINYOPE(MILOLA)	1.581	10	2 4 1			1	4	4				3	2
MAKANGARA	1.186	17	6	0,6								0	0
RUHOMA	758	0	6	0,5			0					0	0
RUCHEMI	721	0	4	1			0					0	0
CHITONJI	1.003	0	2	0,5			12	12				0	3
Total ward	10.971	79		0,65	0	1	50	50	0	0	0		
Total division	20.116	448					52	52	0	0	0		

Division : RONDO

Ward code: 220801 CHIPONDA													
CHIODYA	1.217	2	6 1	8	0	0						1	0
MIHANGA	898	0	6 1	6	0	0						1	0
NTAUNA	974	0	4 1	8	0	0						1	0
RONDO-CHIPONDA	1.067	2	4.1	8	0	0						1	0
Total ward	4.156	4		7,50	0	0	0	0	0	0	0		

District : LINDI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 220802 MNARA												
MKANGA	1.760	4	4 1	6	0	0					1	0
MNARA	2.316	30	4 1	8	0	0	0				1	0
- RONDO ANGLICAN COLLEGE												
MTAKUJA	1.273	0	4 1	8	0	0					1	0
NTENE	1.742	2	4 1	8	0	0	0				1	0
Total ward	7.091	36		7,50	0	0	0	0	0	0		
Total division	11.247	40				0	0	0	0	0		

Division : MCHINGA

Ward code: 220901 MBANJA												
MBANJA	3.162	106	1 2	0	0	1	2	2			3	1
- KIKWETU												
LIKONGO	1.304	54	1	0		1					3	0
- MITOTO												
MITWERO	1.424	104	1	0		1					2	0
Total ward	5.890	264		0	0	3	2	2	0	0	0	

District : LINDI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	Dist. to W/S 2.	Piped W/S in oper.	Hand pumps total	Hand pumps suff.	Hand pumps in-suff.	Hand pumps sea-son. salty	Service level piped W/S	Service level hand pump
Ward code: 220902 MCHINGA												
MCHINGA I	1.622	213	2 3	0	0		9	5		4	0	3
MCHINGA II	2.190	32	2 6	0,5	1		14	14			0	3
MNIMBILA - LIKAHAKU	600	104	2 6				1	1	0	0	0	2
RUVU KITOMANGA	1.007	17	2 6	0,5			2	2	0	0	0	2
(KILANGALA)	2.700	310	2 6	0,5			3	1		2	0	1
MTUMBIKILE	783	104	3					0	0		0	0
Total ward	8.902	781		0,38	0,50	0	29	23	0	6	0	
Ward code: 220903 KILOLAMBWANI												
MNANGOLE	589	126	5 6								0	0
KILOLAMBWANI	940	20	2 6	0,5			2	2	0	0	0	2
MVULENI	2.058	56	2 6	0,5			9	8			0	3
DIMBA	1.186	26	6								0	0
KIJIWENI	1.769	141	2	0,5			6	1	5		0	1
Total ward	6.542	370		0,50	0	0	17	11	6	0	0	
Total division	21.334	1.415					48	36	0	12	0	

District : LINDI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Division : NGAPA													
Ward code: 221001 NGAPA													
KINENGENE	1.600	17	2 1	0	0	0	5	2		3		1	2
MKUPAMA	1.650	320	2	0			9	9				0	3
NGAPA	2.500	62	2	0			7	6		1		0	2
MBUYUNI	2.010	164	2	0			8	8				0	2
Total ward	7.760	563		0	0	0	29	25	0	4	0		
Ward code: 221002 TANDANGONGORO													
TANDANGONGORO	800	29	2	0			3	3				0	2
NANDAMBI	534	76	6	0,5								0	0
NARUNYU	1.000	20	2	0,5			4	3	1			0	2
MKANGA	573	0	6	0,5								0	0
Total ward	2.907	125		0,38	0	0	7	6	1	0	0		
Total division	10.667	688					36	31	1	4	0		
Division : MINGOYO													
Ward code: 221101 MINGOYO													
TULIENI	1.109	44	6	1			0					0	0
MNAZIMMOJA	3.700	72	1 2	0	0	1	2	2	0	0		3	1
RUAHA	500	47	4	1								0	0
MKWAYA	1.360	66	6 1	1	0	1						3	0
MINGOYO	1.893	408	1	0								3	0
Total ward	8.562	637		0,60	0	3	2	2	0	0	0		

District : LINDI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	Dist. to W/S 2.	Piped W/S in oper.	Hand pumps total	Hand pumps suff.	Hand pumps in-suff.	Hand pumps sea-son. salty	Service level piped W/S	Service level hand pump
Ward code : 221102 MNOLELA												
MNOLELA	3.434	134	2 1	0	0	0	6	4	0	2	1	2
RUHOKWE	1.034	10	1	0		0					1	0
SIMANA	1.020	31	1 6	0		0					2	0
NAMUNDA	828	27	1 6	0		0					3	0
ZINGATIA	1.121	14	6								0	0
Total ward	7.437	216		0	0	0	6	4	0	2	0	
Ward code: 221103 KIWALALA												
KIWALALA	1.772	18	4 2 1	1,5	0	0	1	1			1	1
RUO	818	20	2 3	0	0,5		3	2	0	1	0	2
MNANGAWANGA	1.377	16	2								0	1
NARUNYU	1.807	16	2				11	11			0	3
MAHUMBIKA	2.300	20	3 1	0	0						3	0
MPEMBE	510	28	3								0	0
Total ward	8.584	118		0,75	0,17	0	15	14	0	1	0	
Total division	24.593	971					23	20	0	3	0	

District : LINDI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	Dist. to W/S 2.	Piped W/S in oper.	Piped W/S total	Hand pumps suff.	Hand pumps in-suff.	Hand pumps sea-son.	Hand pumps salty	Service level piped W/S	Service level hand pump
Division : NYANGAMARA													
Ward code: 221201 NYANGAMARA													
LITIPU	881	40	2 3 1	1	4	0	2	0	2	0		2	1
MADINGO	1.452	64	3 1	4	0	0						1	0
NYANGAMARA	2.264	94	3 1	0,5	0	0						2	0
Total ward	4.597	198		1,83	1,33	0	2	0	2	0	0		
Ward code: 221202 NAHUKAHUKA													
LINOHA	725	48	2 6 1	1	5	0	4	1	3	0		2	2
NAHUKAHUKA	1.153	54	2 1	1	0	0	5	0	4	1		2	1
LIPOME	721	15	6 1	5	0	0						2	0
MBAWALA	255	0	6 1	0,4	0	0						2	0
Total ward	2.854	117		1,85	1,25	0	9	1	7	1	0		
Ward code: 221203 MANDWANGA													
MANDWANGA	875	10	6	1								0	0
NAMBAHU	1.800	62	5	10								0	0
MALUNGO	1.054	20	5	5								0	0
CHIUTA	1.857	18	6	5								0	0
LINDWANDWALI	625	0	6	3								0	0
Total ward	6.211	110		4,80	0	0	0	0	0	0	0		
Total division	13.662	425					11	1	9	1	0		

District : LINDI

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	Dist. to W/S 2.	Piped W/S in oper.	Piped W/S total	Hand pumps suff.	Hand pumps in-suff.	Hand pumps sea-son.	Hand pumps salty	Service level piped W/S	Service level hand pump
Division : SUDI													
Ward code: 221301 SUDI													
SUDI	1.658	23	3	0,5			0					0	0
MTEGU	769	154	2 1	0,5	0	0	3	2		1		1	2
HINGAWALI	1.806	17	2 6	0,5			3	3				0	2
MADANGWA	2.000	22	6 1	1,5	0	0	0					1	0
NJONJO	740	40	3 6	0,5			3			3		0	2
PANGATENA	1.500	6	2 6				2	2				0	1
Total ward	8.473	261		0,70	0	0	11	7	0	4	0		
Ward code: 221302 NACHUNYU													
PANGABOI	900	51	3 1	1	0	0	0					2	0
MSANGI	480	14	2 6	0			1	0	0	1		1	0
KITUMBIKWELA	1.251	40	3	1,5			0					0	0
NACHUNYU	1.852	65	2 1		0	0	4	0	1	3		1	1
MMUMBU	712	30	6	0			0					0	0
SHUKA	468	16	5	1			0					0	0
MNALI	1.260	26	6	0								0	0
NAVANGA	837	16	6	0								0	0
- MONGOMONGO													
NAMPUNGA	441	16	3 1	0,5	0	0	0					2	0
Total ward	8.201	274		0,50	0	0	5	0	1	4	0		
Total division	16.674	535					16	7	1	8	0		
Total district	259.982	7.604					494	418	22	53	6		

23 LIWALE DISTRICT

Divisions		Wards	
01	Kibutuka	01	Nangano
		02	Kibutuka
		03	Kiangara
		04	Mirui
02	Liwale	01	Liwale
		02	Mihumo
		03	Ngongowele
		04	Mbaya
		05	Mpigamiti
		06	Kimambi
		07	Liwale Mjini
03	Makata	01	Barikiwa
		02	Makata
		03	Mkutano
		04	Mlembwe

District : LIWALE

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in	oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Division : KIBUTUKA														
Ward code: 230101 NANGANO														
NANGANO	881	8	4	1,2		0	0	0	0	0	0	0	0	
- NAMATULA														
NAHORO	1.066	0	6										0	0
Total ward	1.947	8		1,20	0	0	0	0	0	0	0	0		
Ward code: 230102 KIBUTUKA														
KIBUTUKA	1.309	6	1	6		4,5	0	0	0	0	0	0	1	0
- KIBUTUKA A														
- KIBUTUKA B														
NGUMBU	1.344	0	6										0	0
Total ward	2.653	6		0		4,50	0	0	0	0	0	0		
Ward code: 230103 KIANGARA														
NAUJOMBO	1.115	0	6										0	0
KIPELELE	667	0	6										0	0
KIANGARA	1.391	0	2	1			0	4	4	0	0	0	1	2
KITOGORO	871	0	6	2,2			0	0	0	0	0	0	0	0
Total ward	4.044	0		2,20	0		0	4	4	0	0	0		

District : LIWALE

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 230104 MIRUI												
MIRUI	1.634	0	6								0	0
Total ward	1.634	0		0	0	0	0	0	0	0		
Total division	10.278	14					4	4	0	0	0	
Division : LIWALE												
Ward code: 230201 LIWALE B												
LIWALE B	1.337	14	4 1	1,5	3,5	0	0	0	0	0	1	0
MIKUNYA	1.644	1	6 1	0		0	0	0	0	0	1	0
Total ward	2.981	15		0,75	3,50	0	0	0	0	0		
Ward code: 230202 MIHUMO												
LIKOMBORA	678	16	2 4 1			0	3	3	0	0	0	1 3
MIHUMO	2.191	6	2 6 4			0	7	7	0	0	0	0 3
Total ward	2.869	22		0	0	0	10	10	0	0	0	

District : LIWALE

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 230203													
NGONGOWELE													
NGONGOWELE	1.730	2	1 6		1,7	0	0	0	0	0	0	1	0
NGUNJA	790	0	1 6		1,2	0	0	0	0	0	0	1	0
LILOMBE	1.650	4	6									0	0
Total ward	4.170	6		0	1,45	0	0	0	0	0	0		
Ward code: 230204													
MBAYA													
MBAYA	1.058	2	2 1			0	5	5	0	0	0	2	3
NDURUKA	887	0	2			0	5	5	0	0	0	0	3
KICHONDA	373	0	1 3		1,2	0	0	0	0	0	0	2	0
NAMIHU	822	17	6									0	0
Total ward	3.140	19		0	1,20	0	10	10	0	0	0		
Ward code: 230205													
MPIGAMITI													
MPIGAMITI	1.878	68	4 6 1	3	3	0	0	0	0	0	0	1	0
- MPIGAMITI A													
- MPIGAMITI B													
- MPIGAMITI C													
Total ward	1.878	68		3,00	3,00	0	0	0	0	0	0		

District : LIWALE

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 230206 KIMAMBI													
KIMAMBI	1.233	0	2 6				5	4	0	0	1	0	2
Total ward	1.233	0		0	0	0	5	4	0	0	1		
Ward code: 230207 LIWALE MJINI													
NALULEO	723	7	4 2 1	1,2		0		0	0	0	0	2	1
MUNGURUMO	3.043	9	1 4 2		2,2	1		0	0	0	0	2	1
LIKONGOWELE	2.111	13	1 4 2		1,7	0	2	0	0	0	0	2	1
MAKONJIANGA	1.539	20	1 2 4		1,7	0	5	5	0	0	0	2	1
NANGANDO	2.284	4	1 4 2		2,2	1		0	0	0	0	2	1
MANGIRIKITI	973	15	1 4		1,7	0	0	0	0	0	0	1	0
KIPULE	1.644	9	1 4		1,2	0	0	0	0	0	0	2	0
Total ward	12.317	76		1,20	1,78	2	7	5	0	0	0		
Total division	28.588	206					32	29	0	0	1		

District : LIWALE

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	Dist. to W/S 2.	Piped W/S in oper.	Piped W/S total	Hand pumps suff.	Hand pumps in-suff.	Hand pumps sea-son.	Hand pumps salty	Service level piped W/S	Service level hand pump
Division : MAKATA													
Ward code: 230301 BARIKIWA													
BARIKIWA	1.260	16	2 6 1			0	4	4	0	0	0	1	2
NDUNYUNGU	513	0	2			0	5	5	0	0	0	0	3
CHIUMBUKO	1.652	0	6									0	0
Total ward	3.425	16		0	0	0	9	9	0	0	0		
Ward code: 230302 MAKATA													
MPENGERE	796	17	6									0	0
MAKATA	1.260	83	2 1			0	7	7	0	0	0	1	2
MKUNDI	997	8	2			0	5	5	0	0	0	0	3
Total ward	3.053	110		0	0	0	12	12	0	0	0		
Ward code: 230303 MKUTANO													
MKUTANO	687	0	2			0	5	5	0	0	0	3	3
KIKULYUNGU	835	0	2			0	5	2	0	3	0	0	2
Total ward	1.522	0		0	0	0	10	7	0	3	0		

District : LIWALE

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 230304 MLEMBWE													
NDAPATA	996	0	6 1				0					1	0
MLEMBWE	2.037	5	6									0	0
Total ward	3.033	5		0	0	0	0	0	0	0	0		
Total division	11.033	131					31	28	0	3	0		
Total district	49.855	344					67	63	0	3	1		

24 NACHINGWEA DISTRICT

Divisions		Wards	
01	Kilimarondo	01	Kilimarondo
		02	Matekwe
		03	Mbondo
		04	Kiegei
02	Lionja	01	Lionja
		02	Nditi
		03	Namikango
03	Mnero	01	Mnero Miembeni
		02	Mnero Ngongo
		03	Kipara
		04	Namapwia
04	Ruponda	01	Ruponda
		02	Marambo
		03	Chiola
		04	Mkoka
05	Nambambo	01	Naipanga
		02	Ndomoni
		03	Mkotokwyana
		04	Mpiruka
		05	Naipingo
		06	Mtua
06	Nambambo Mjini	01	Nambambo
		02	Kilimani Hewa
		03	Nangowe
		04	Stesheni
		05	Namatula

District : NACHINGWEA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	Hand pumps total	suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Division : KILIMARONDO													
Ward code: 240101													
KILIMARONDO													
KILIMARONDO	1.100	0	1 2	0	0,5	0	10	10	0	0	0	2	3
- SEBULENI													
- NJAPEJE													
- NAMAKONO													
- ANURU													
NAMATUNU	1.320	2	2 6	2,2	1,2		3	3	0	0	0	0	2
NANJIHI	1.320	0	2 3 6	1,2			2	2	0	0	0	0	2
Total ward	3.740	2		1,13	0,85	0	15	15	0	0	0		
Ward code: 240102													
MATEKWE													
MATEKWE	3.085	45	1 2 6	0	1,7	0	3	3	0	0	0	1	1
- MAJONANGA													
Total ward	3.085	45		0	1,70	0	3	3	0	0	0		
Ward code: 240103													
MBONDO													
MBONDO	1.299	2	1 2 6	0	1,2	0	6	6	0	0	0	1	3
CHIMBENDENGA	1.062	1	1 2	0	0,7	0	6	6	0	0	0	1	3
NAKALONJI	992	0	6 1	1,2	0	0	0	0	0	0	0	2	0
NAHIMBA	749	0	1 2	0	2,7	0	4	4	0	0	0	2	3
Total ward	4.102	3		0,30	1,15	0	16	16	0	0	0		

District : NACHINGWEA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	Dist. to W/S 2.	Piped W/S in oper.	Piped W/S total	Hand pumps suff.	Hand pumps in-suff.	Hand pumps sea-son.	Hand pumps salty	Service level piped W/S	Service level hand pump
Ward code: 240104 KIEGEI													
KIEGEI	1.870		0 2 4 1	1,5	1,5	2	7	7	0	0	0	0	3
- ITULA													
- NAMANGA													
Total ward	1.870		0	1,50	1,50	2	7	7	0	0	0		
Total division	12.527		50				41	41	0	0	0		
Division : LIONJA													
Ward code: 240201 LIONJA													
LIONJA A	3.108		22 2 3 1				7	7	0	0	0	2	2
LIONJA B	1.670		0 3				0					0	0
NGUNICHILE	2.568		25 2 3				2	2	0	0	0	0	1
Total ward	7.346		47	0	0	0	9	9	0	0	0		
Ward code: 240202 NDITI													
NDITI	1.578		1 3 4	1,7	0,7		0	0	0	0	0	0	0
- MIANZINI													
- MTAMAILULU													
NAMANJA	1.095		0 4 6	3,5	3,5		0	0	0	0	0	0	0
Total ward	2.673		1	2,60	2,10	0	0	0	0	0	0		

District : NACHINGWEA

	Popul-ation 1984	Live-stock units 1981	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in- suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 240203 NAMIKANGO													
NAMIKANGO	1.548	10	1 6	0	1,2	0	0	0	0	0	0	1	0
NANGUNDE	2.105	11	1 3 6	0	1,2	0	0	0	0	0	0	1	0
Total ward	3.653	20		0	1,20	0	0	0	0	0	0		
Total division	13.673	68					9	9	0	0	0		
Division : MNERO													
Ward code: 240301 MNERO MIEMBENI													
MNERO MIEMBENI	1.583	17	2 1				4	4	0	0	0	1	2
MKONJELA	1.490	20	2 1	0,7		0	5	5	0	0	0	1	2
NTILA	920	25	2 1 6	1	0	0	9	9	0	0	0	1	3
NAMKULA	840	1	6	0,7		0	0	0	0	0	0	0	0
Total ward	4.833	63		0,80	0	0	18	18	0	0	0		
Ward code: 240302 MNERO NGONGO													
MPUTE	1.169	0	2	1		0	1	1	0	0	0	0	1
KITANDI	834	2	6 1	0,7		0	0	0	0	0	0	1	0
NGONGO	2.400	90	2 1	0,6		0	10	10	0	0	0	1	3
Total ward	4.403	92		0,77	0	0	11	11	0	0	0		

District : NACHINGWEA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 240303													
KIPARA													
MWANDILA	872	1	2	0,7			6	5	0	1	0	0	3
KIPARA-MNERO	623	2	6 1	0,7	0,7	2	0	0	0	0	0	1	0
NAMBALAPALA - LIBUNDU	1.338	0	6 1	1,5		2	0	0	0	0	0	1	0
Total ward	2.833	3		0,97	0,70	4	6	5	0	1	0		
Ward code: 240304													
NAMAPWIA													
NAMAPWIA	1.400	1	2				5	5				0	3
LIKONGOWELE	1.300	0	3									0	0
Total ward	2.700	1		0	0	0	5	5	0	0	0		
Total division	14.769	159					40	39	0	1	0		
Division : RUPONDA													
Ward code: 240401													
RUPONDA													
RUPONDA	1.515	45	2	0,5			6	6	0	0	0	0	3
MANDAWA	791	4	6 1	0,6	0	0	0	0	0	0	0	1	0
NAMANGA	1.666	21	2 1	0,6		2	7	7	0	0	0	1	3
Total ward	3.972	70		0,57	0	2	13	13	0	0	0		

District : NACHINGWEA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps in suff.	in- suff.	sea- son.	salty	Service level piped W/S	hand pump
Ward code: 240402 MARAMBO													
IKUNGU	733	10	6	0,6			0	0	0	0	0	0	0
RUPOTA	1.039	8	6 2	0,3		0	2	2	0	0	0	0	2
MARAMBO	2.483	50	6 1	0,6	0	0	0	0	0	0	0	1	0
LITULA	954	31	3 6 1	0,7	0,7	0	0	0	0	0	0	1	0
- NANDILE													
- MTAA WA CHINGUNDULI													
- CHANIKA													
- MCHANAMO													
Total ward	5.209	99		0,55	0,35	0	2	2	0	0	0		
Ward code: 240403 CHIOLA													
MTIMBO													
NACHINGWEA	1.057	21	4 1	0,2	0	0	0	0	0	0	0	2	0
CHIOLA	1.828	37	2 3 1	0	0	0	1	1	0	0	0	2	1
CHINGUNDULI	1.009	35	4 1	4,5	0	0	0	0	0	0	0	2	0
Total ward	3.894	94		1,57	0	0	1	1	0	0	0		
Ward code: 240404 MKOKA													
RWEJE	1.100	4	6 1	0,7	0		0	0	0	0	0	1	0
MKOKA	1.520	30	1	0		0						2	0
LIKWELA	495	0	6									0	0
Total ward	3.115	34		0,35	0	0	0	0	0	0	0		
Total division	16.190	297					16	16	0	0	0		

District : NACHINGWEA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S		Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Division : NANBAMBO														
Ward code: 240501														
NAIPANGA														
NAIPANGA	3.849	62	1	6	0	0,7	0	0	0	0	0	0	1	0
CHIUMBATI SHULENI	967	95		6	0,2			0	0	0	0	0	0	0
CHIUMBATI MIEMBENI	899	24		6									0	0
Total ward	5.715	182			0,10	0,70	0	0	0	0	0	0		
Ward code: 240502														
NDOMONI														
NDOMONDO	1.800	187	6	1	0,7	0	0	0	0	0	0	0	2	0
NDOMONI	1.134	11	6	5		8		0	0	0	0	0	0	0
Total ward	2.934	199			0,70	4,00	0	0	0	0	0	0		
Ward code: 240503														
MKOTOKWYANA														
MKOTOKWYANA	518	18	1	6	0		0						1	0
MANDAI	1.150	31	1	6	0	7	0	0	0	0	0	0	1	0
Total ward	1.668	49			0	7	0	0	0	0	0	0		
Ward code: 240504														
MPIRUKA														
MKUMBA	1.768	58	1	6	0,3		0	0	0	0	0	0	1	0
MPIRUKA	1.728	73	6	1	0,2	0	0	0					1	0
Total ward	3.496	131			0,25	0	0	0	0	0	0	0		

District : NACHINGWEA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	Dist. to W/S 2.	Piped W/S in oper.	Hand pumps total	Hand pumps suff.	Hand pumps in-suff.	Hand pumps sea-son. salty	Service level piped W/S	Service level hand pump
Ward code: 240505 NAIPINGO												
MCHANGANI	1.800	25	6 1	0,2	0	0	0	0	0	0	1	0
NAIPINGO	4.499	66	2 1	0,5	0	0	10	10	0	0	1	2
Total ward	6.299	91		0,35	0	0	10	10	0	0		
Ward code: 240506 MTUA												
KIPARA MTUA	1.774	2	5 6 1	5,5	0	0	0	0	0	0	1	0
NALENGWE	816	1	1 6	0,2	0,7	0	0	0	0	0	2	0
- NANDONDO MTUA	2.448	3	1 6	0	0,2	0	0	0	0	0	2	0
Total ward	5.038	6		1,90	0,30	0	0	0	0	0		
Total division	25.150	659					10	10	0	0		

Division : NAMBAMBO MJINI

Ward code: 240601 NAMBAMBO												
NAMBAMBO	8.656	160	1 2	0	0,5	1	26	24	0	2	1	3	2
Total ward	8.656	160		0	0,50	1	26	24	0	2	1		

District : NACHINGWEA

	Popul-ation 1984	Live-stock units 1984	Edist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 240602 KILIMANI HEWA													
KILIMANI HEWA - SUNGURA	3.444	48	1 6	0	1,2	1	0	0	0	0	0	3	0
Total ward	3.444	48		0	1,20	1	0	0	0	0	0		
Ward code: 240603 NANGOWE													
MWENGE	452	19	6 1	0,3	0	0	0	0	0	0	0	1	0
MITUMBATI	1.944	31	6 1	0,4	0	0	0	0	0	0	0	1	0
NANGOWE SHULENI	1.540	23	6	1		0	0	0	0	0	0	0	0
NANGOWE MATANKINI	2.189	4	6									0	0
Total ward	6.125	77		0,57	0	0	0	0	0	0	0		
Ward code: 240604 SIESHENI													
SONGAMBELE	2.331	28	6	0,1		0	0	0	0	0	0	0	0
CHEMCHEM	1.965	144	2	0,5		0	3	3	0	0	0	0	1
SIESHENI	8.896	83	1 2	0	0,7	0	2	0	0	2	0	2	1
Total ward	13.192	255		0,20	0,70	0	5	3	0	2	0		

District : NACHINGWEA

	Popul-ation 1984	Live-stock units 1984	Exist-ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in-suff.	sea-son.	salty	Service level piped W/S	hand pump
Ward code: 240605 NAMATULA													
NAMATULA	3.328	22	2 1	0,7	0	0	10	0	0	10	0	2	1
Total ward	3.328	22		0,70	0	0	10	0	0	10	0		
Total division	34.745	562					41	27	0	14	0		
Total district	117.414	1.794					157	142	0	15	0		

25 LINDI TOWN

District : LINDI TOWN

	Popul- ation 1984	Live- stock units 1984	Exist- ing W/S	Dist. to W/S 1.	2.	Piped W/S in oper.	total	Hand pumps suff.	in- suff.	sea- son.	salty	Service level piped W/S	hand pump
Division :													
Ward code: 2501													
LINDI TOWN	36.600	0	1 3	0	0,5	1	0					2	3
Total district	36.600	0		0	0,50	1	0	0	0	0	0		
Total region	594.391	11.163					913	763	37	114	8		

SELECTED VILLAGE DATA

1. Use of different types of water supplies
   Main water supply
   Secondary water supply

2. Distance to main water supply

3. Service level of water supplies

4. Existence of pit latrines in households

MASASI DISTRICT

1
Use of Different Types of Water Supplies

1. priority: the main water supply
2. priority: the secondary water supply
Total: coverage of a certain type of water supply regardless of its priority

	1. priority			2. priority			Total		
	no of villages	people	%	no of villages	people	%	no of villages	people	%
Piped W/S	54	105.828	34,54	16	25.182	8,22	79	147.581	48,17
Hand pump	58	81.249	26,52	20	54.274	17,72	82	141.477	46,18
Open well	1	1.244	0,41	16	25.153	8,21	18	28.113	9,18
River	17	17.149	5,60	29	34.144	11,15	54	61.408	20,04
Dam	1	1.674	0,55	2	1.948	0,64	4	7.402	2,42
Open pit	74	99.213	32,38	53	73.471	23,98	127	172.684	56,37
Spring	0	0	0	4	5.993	1,96	5	7.512	2,45
Rainwater	0	0	0	0	0	0	0	0	0

2
Distance to Main Water Supply

(tap in a piped W/S, hand pump, open well, dam, etc.)

Distance	No. of villages	Population
0 - 0,5 km	46	82.809
0,6 - 1,0 km	2	3.345
1,1 - 2,0 km	31	39.765
2,1 - 5,0 km	11	13.947
> 5,0 km	6	5.774
no info	109	160.717

3

Water Supply Service Level

Key:

0: **No service.** No improved water systems (piped W/S or hand pump) constructed.

1: **No real service.** Improved W/S constructed but not functioning.

2: **Limited service.** Improved W/S constructed but operation, capacity or water quality unsatisfactory.

3: **Full service.** Improved W/S functioning according to minimum service level criteria.

	Piped W/S			Hand pumps			Total		
Service level	no of villages	people	%	no of villages	people	%	no of villages	people	%
0	126	158.776	51,83	124	166.554	54,37	74	87.819	28,67
1	16	27.095	8,84	30	53.767	17,55	28	45.105	14,72
2	33	66.540	21,72	36	68.315	22,30	58	101.766	33,22
3	30	53.946	17,61	15	17.721	5,78	45	71.667	23,39

4

Latrines

Households having pit latrines	No. of villages	Population
0 - 20 %	4	4.446
21 - 40 %	9	14.731
41 - 60 %	59	79.347
61 - 80 %	70	109.157
80 -100 %	49	63.148
no info	14	35.528

MTWARA DISTRICT

1

Use of Different Types of Water Supplies

1. priority: the main water supply
2. priority: the secondary water supply
Total: coverage of a certain type of water supply regardless of its priority

	1. priority			2. priority			Total		
	no of villages	people	%	no of villages	people	%	no of villages	people	%
Piped W/S	35	40.246	27,45	10	15.007	10,23	59	79.540	54,24
Hand pump	45	49.016	33,43	16	17.293	11,79	63	68.627	46,80
Open well	41	25.427	17,34	38	38.591	26,32	80	66.018	45,02
River	4	5.422	3,70	5	7.037	4,80	12	17.617	12,01
Dam	6	6.673	4,55	11	14.727	10,04	24	31.465	21,46
Open pit	20	15.397	10,50	5	7.885	5,38	25	23.282	15,88
Spring	2	4.454	3,04	3	2.091	1,43	5	6.545	4,46
Rainwater	0	0	0	1	1.050	0,72	1	1.050	0,72

2

Distance to Main Water Supply

(tap in a piped W/S, hand pump, open well, dam, etc.)

Distance	No. of villages	Population
0 - 0,5 km	78	88.108
0,6 - 1,0 km	11	13.103
1,1 - 2,0 km	15	8.400
2,1 - 5,0 km	25	13.721
> 5,0 km	7	8.052
no info	17	15.251

3

Water Supply Service Level

Key:

0: **No service.** No improved water systems (piped W/S or hand pump) constructed.

1: **No real service.** Improved W/S constructed but not functioning.

2: **Limited service.** Improved W/S constructed but operation, capacity or water quality unsatisfactory.

3: **Full service.** Improved W/S functioning according to minimum service level criteria.

	Piped W/S			Hand pumps			Total		
Service level	no of villages	people	%	no of villages	people	%	no of villages	people	%
0	93	66.420	45,30	91	80.026	54,57	49	29.316	19,99
1	19	27.391	18,68	10	14.792	10,09	17	22.231	15,16
2	20	32.486	22,15	23	28.126	19,18	37	51.059	34,82
3	21	20.338	13,87	29	23.691	16,16	50	44.029	30,03

4

Latrines

Households having pit latrines	No. of villages	Population
0 - 20 %	18	18.379
21 - 40 %	30	25.424
41 - 60 %	52	41.538
61 - 80 %	19	23.602
80 -100 %	5	11.344
no info	29	26.348

NEWALA DISTRICT

1

Use of Different Types of Water Supplies

1. priority: the main water supply
2. priority: the secondary water supply
Total: coverage of a certain type of water supply regardless of its priority

	1. priority			2. priority			Total		
	no of villages	people	%	no of villages	people	%	no of villages	people	%
Piped W/S	171	177.066	54,13	24	23.908	7,31	231	266.098	81,35
Hand pump	18	14.357	4,39	3	2.251	0,69	21	16.608	5,08
Open well	23	27.917	8,53	60	74.690	22,83	89	111.911	34,21
River	2	1.688	0,52	4	4.152	1,27	22	24.021	7,34
Dam	2	1.399	0,43	17	13.716	4,19	26	23.153	7,08
Open pit	32	25.497	7,80	34	28.682	8,77	66	54.179	16,56
Spring	51	71.777	21,94	3	5.019	1,53	55	77.994	23,84
Rainwater	9	5.989	1,83	119	140.013	42,81	181	203.488	62,21

2

Distance to Main Water Supply

(tap in a piped W/S, hand pump, open well, dam, etc.)

Distance	No. of villages	Population
0 - 0,5 km	156	164.768
0,6 - 1,0 km	6	4.851
1,1 - 2,0 km	16	24.876
2,1 - 5,0 km	33	28.218
> 5,0 km	92	98.333
no info	19	6.045

3

Water Supply Service Level

Key:

0: **No service.** No improved water systems (piped W/S or hand pump) constructed.

1: **No real service.** Improved W/S constructed but not functioning.

2: **Limited service.** Improved W/S constructed but operation, capacity or water quality unsatisfactory.

3: **Full service.** Improved W/S functioning according to minimum service level criteria.

	Piped W/S			Hand pumps			Total		
Service level	no of villages	people	%	no of villages	people	%	no of villages	people	%
0	91	57.687	17,64	308	314.057	96,02	86	52.764	16,13
1	68	91.898	28,10	4	3.415	1,04	65	89.972	27,51
2	43	48.879	14,94	6	5.968	1,82	47	52.077	15,92
3	120	128.627	39,32	4	3.651	1,12	124	132.278	40,44

4

Latrines

Households having pit latrines	No. of villages	Population
0 - 20 %	7	3.356
21 - 40 %	10	8.260
41 - 60 %	60	47.436
61 - 80 %	133	138.752
80 -100 %	49	70.672
no info	63	58.615

KILWA DISTRICT

1

Use of Different Types of Water Supplies

1. priority: the main water supply
2. priority: the secondary water supply
Total: coverage of a certain type of water supply regardless of its priority

	1. priority			2. priority			Total		
	no of villages	people	%	no of villages	people	%	no of villages	people	%
Piped W/S	14	30.787	23,50	6	12.000	9,16	24	53.589	40,91
Hand pump	28	50.549	38,58	5	13.100	10,00	33	63.649	48,58
Open well	30	31.552	24,08	31	60.131	45,90	63	95.224	72,69
River	9	11.220	8,56	4	7.057	5,39	13	18.277	13,95
Dam	0	0	0	0	0	0	0	0	0
Open pit	12	6.899	5,27	14	17.158	13,10	26	24.057	18,36
Spring	0	0	0	1	800	0,61	2	2.516	1,92
Rainwater	1	0	0	0	0	0	1	0	0

2

Distance to Main Water Supply

(tap in a piped W/S, hand pump, open well, dam, etc.)

Distance	No. of villages	Population
0 - 0,5 km	49	84.842
0,6 - 1,0 km	9	17.215
1,1 - 2,0 km	12	9.274
2,1 - 5,0 km	8	6.559
> 5,0 km	0	0
no info	16	13.117

3

Water Supply Service Level

Key:

0: **No service.** No improved water systems (piped W/S or hand pump) constructed.

1: **No real service.** Improved W/S constructed but not functioning.

2: **Limited service.** Improved W/S constructed but operation, capacity or water quality unsatisfactory.

3: **Full service.** Improved W/S functioning according to minimum service level criteria.

	Piped W/S			Hand pumps			Total		
Service level	no of villages	people	%	no of villages	people	%	no of villages	people	%
0	72	82.920	63,29	62	68.758	52,48	46	39.971	30,51
1	7	11.400	8,70	8	19.694	15,03	10	13.394	10,22
2	11	19.513	14,89	13	22.692	17,32	23	40.605	30,99
3	4	17.174	13,11	11	19.863	15,16	15	37.037	28,27

4

Latrines

Households having pit latrines	No. of villages	Population
0 - 20 %	5	8.115
21 - 40 %	28	51.760
41 - 60 %	18	41.439
61 - 80 %	0	0
80 -100 %	0	0
no info	43	29.693

LINDI DISTRICT

1

Use of Different Types of Water Supplies

1. priority: the main water supply
2. priority: the secondary water supply
Total: coverage of a certain type of water supply regardless of its priority

	1. priority			2. priority			Total		
	no of villages	people	%	no of villages	people	%	no of villages	people	%
Piped W/S	21	36.111	13,89	46	74.172	28,53	77	126.138	48,52
Hand pump	76	120.071	46,18	15	28.396	10,92	91	148.467	57,11
Open well	29	31.037	11,94	37	49.341	18,98	71	85.768	32,99
River	27	32.715	12,58	5	9.135	3,51	34	46.321	17,82
Dam	6	6.665	2,56	0	0	0	6	6.665	2,56
Open pit	32	33.383	12,84	21	26.735	10,28	53	60.118	23,12
Spring	0	0	0	0	0	0	1	1.451	0,56
Rainwater	0	0	0	0	0	0	0	0	0

2

Distance to Main Water Supply

(tap in a piped W/S, hand pump, open well, dam, etc.)

Distance	No. of villages	Population
0 - 0,5 km	104	156.326
0,6 - 1,0 km	13	13.965
1,1 - 2,0 km	12	14.739
2,1 - 5,0 km	18	17.247
> 5,0 km	14	18.583
no info	31	39.122

3

Water Supply Service Level

Key:

0: **No service.** No improved water systems (piped W/S or hand pump) constructed.

1: **No real service.** Improved W/S constructed but not functioning.

2: **Limited service.** Improved W/S constructed but operation, capacity or water quality unsatisfactory.

3: **Full service.** Improved W/S functioning according to minimum service level criteria.

	Piped W/S			Hand pumps			Total		
Service level	no of villages	people	%	no of villages	people	%	no of villages	people	%
0	117	139.450	53,64	104	115.263	44,33	58	57.061	21,95
1	36	56.706	21,81	19	42.411	16,31	37	53.855	20,71
2	24	35.610	13,70	41	58.032	22,32	54	76.574	29,45
3	15	28.216	10,85	28	44.276	17,03	43	72.492	27,88

4

Latrines

Households having pit latrines	No. of villages	Population
0 - 20 %	10	11.799
21 - 40 %	57	70.763
41 - 60 %	34	39.251
61 - 80 %	21	33.914
80 -100 %	41	59.796
no info	29	44.459

LIWALE DISTRICT

1

Use of Different Types of Water Supplies

1. priority: the main water supply
2. priority: the secondary water supply
Total: coverage of a certain type of water supply regardless of its priority

	1. priority			2. priority			Total		
	no of villages	people	%	no of villages	people	%	no of villages	people	%
Piped W/S	11	17.133	34,34	5	6.349	12,72	20	28.021	56,16
Hand pump	12	12.990	26,03	2	2.262	4,53	17	22.690	45,47
Open well	0	0	0	1	373	0,75	1	373	0,75
River	3	3.482	6,98	7	12.070	24,19	12	19.282	38,64
Dam	0	0	0	0	0	0	0	0	0
Open pit	13	16.294	32,65	7	10.391	20,82	20	26.685	53,48
Spring	0	0	0	0	0	0	0	0	0
Rainwater	0	0	0	0	0	0	0	0	0

2

Distance to Main Water Supply

(tap in a piped W/S, hand pump, open well, dam, etc.)

Distance	No. of villages	Population
0 - 0,5 km	1	1.644
0,6 - 1,0 km	0	0
1,1 - 2,0 km	3	2.941
2,1 - 5,0 km	2	2.749
> 5,0 km	0	0
no info	33	42.565

3

Water Supply Service Level

Key:

0: **No service.** No improved water systems (piped W/S or hand pump) constructed.

1: **No real service.** Improved W/S constructed but not functioning.

2: **Limited service.** Improved W/S constructed but operation, capacity or water quality unsatisfactory.

3: **Full service.** Improved W/S functioning according to minimum service level criteria.

	Piped W/S			Hand pumps			Total		
Service level	no of villages	people	%	no of villages	people	%	no of villages	people	%
0	19	21.878	43,84	22	27.209	54,53	12	14.535	29,13
1	11	13.909	27,87	5	9.700	19,44	7	9.320	18,68
2	9	14.112	28,28	5	5.979	11,98	13	19.033	38,14
3	0	0	0	7	7.011	14,05	7	7.011	14,05

4

Latrines

Households having pit latrines	No. of villages	Population
0 - 20 %	0	0
21 - 40 %	3	4.312
41 - 60 %	12	14.162
61 - 80 %	9	13.126
80 -100 %	2	1.096
no info	13	17.203

NACHINGWEA DISTRICT

1

Use of Different Types of Water Supplies

1. priority: the main water supply
2. priority: the secondary water supply
Total: coverage of a certain type of water supply regardless of its priority

	1. priority			2. priority			Total		
	no of villages	people	%	no of villages	people	%	no of villages	people	%
Piped W/S	17	44.013	37,51	18	28.364	24,18	37	75.979	64,76
Hand pump	18	34.821	29,68	8	25.886	22,06	26	60.707	51,74
Open well	4	5.502	4,69	5	10.929	9,32	9	16.431	14,00
River	3	3.161	2,69	2	3.448	2,94	5	6.609	5,63
Dam	1	1.774	1,51	1	1.134	0,97	2	2.908	2,48
Open pit	22	28.052	23,91	12	20.684	17,63	34	48.736	41,54
Spring	0	0	0	0	0	0	0	0	0
Rainwater	0	0	0	0	0	0	0	0	0

2

Distance to Main Water Supply

(tap in a piped W/S, hand pump, open well, dam, etc.)

Distance	No. of villages	Population
0 - 0,5 km	43	85.052
0,6 - 1,0 km	3	3.629
1,1 - 2,0 km	5	7.098
2,1 - 5,0 km	3	3.424
> 5,0 km	1	1.774
no info	10	16.346

3

Water Supply Service Level

Key:

0: **No service.** No improved water systems (piped W/S or hand pump) constructed.

1: **No real service.** Improved W/S constructed but not functioning.

2: **Limited service.** Improved W/S constructed but operation, capacity or water quality unsatisfactory.

3: **Full service.** Improved W/S functioning according to minimum service level criteria.

	Piped W/S			Hand pumps			Total		
Service level	no of villages	people	%	no of villages	people	%	no of villages	people	%
0	28	41.344	35,24	39	56.616	48,26	14	17.725	15,11
1	23	38.336	32,68	6	21.670	18,47	20	33.423	28,49
2	12	25.543	21,77	10	25.699	21,90	19	40.737	34,72
3	2	12.100	10,31	10	13.338	11,37	12	25.438	21,68

4

Latrines

Households having pit latrines	No. of villages	Population
0 - 20 %	1	1.150
21 - 40 %	5	7.864
41 - 60 %	12	23.057
61 - 80 %	32	56.271
80 -100 %	5	13.314
no info	10	15.667

PIPED WATER SUPPLY QUESTIONNAIRE FORM

Filled by _____

Date _____

1. Name of W/S _____
2. Type of W/S: piped ☐ handpump ☐
3. Location: Region: Mtwara ☐ Lindi ☐
   District: _____
4. Scheme Area: _____ km^2, towns, villages served: _____
   _____
   (map or lay-out plan to be attached)
5. Map reference: _____
6. Source: river ☐ (name: _____)
   dam ☐ spring ☐ borehole ☐ well ☐
7. Means of abstraction: _____
8. Rising main: Ø _____ mm
9. Treatment: _____
10. Reservoirs: no. _____, total capacity: _____ m^3
11. Lenght of distribution piping: _____ km
12. Diameters of distribution mains: Ø _____ mm
13. Scheme constructed by: _____ in year _____
14. Scheme operated by: _____
15. Design capacity: _____ m^3/d
16. Present operation:
    scheme in operation during the visit ☐ , not in operation ☐ since _____, reason _____.
    Scheme in operation during the last 3 months for _____ days.
17. Normal operation capacity: _____ m^3/hr, _____ m^3/d.

18. Power: electricity ☐ fuel ☐ gravity ☐ manual ☐

19. Consumers: _____ people _____ cattle

20. Cattle is using the W/S:

only ☐ partly ☐ not at all ☐

21. No of house connections _____, no of public taps _____

22. Main consumers:

school ☐ , which _____

farm ☐ , which _____

ranch ☐ , which _____

administration ☐ , which _____

institution ☐ , which _____

other ☐ , which _____

23. Need for Rehabilitation: _____

24. Need for Expansion: _____

25. Possibilities for Expansion: _____

26. Comments: _____

_____

_____

PIPED WATER SUPPLY SCHEMES

Masasi District
Mtwara District
Newala District
Kilwa District
Lindi District
Liwale District
Nachingwea District

Key to abreviations and symbols:

Column 8, source

1 = borehole
2 = well
3 = spring
4 = stream
5 = dam

Column 9, quality

1 = good
2 = polluted
3 = badly polluted
4 = salty
5 = very salty

Column 15, power

0 = gravity
1 = diesel
2 = electricity

Column 20, condition

1 = operating, good condition
2 = operational, no fuel
3 = minor mechanical faults
4 = minor faults in pipes or tanks
5 = major mechanical faults
6 = major faults in pipes or tanks
7 = problem with the source

Column 22, rehabilitation

I = First priority
II = After fuel and spares supply has improved
III = After Ii
Aban = To be abandoned

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
									Yield			Capacity										
No	Name of the Scheme	Division	Villages covered	Population 1984	Year of construction	Under construction	Source	Quality	m^3/h	Sufficient	Treatment	m^3/d	Sufficient	Power	No of boosters	Static head m	Pipelines m	No of taps	Condition	Operating last 6 months, days	Rehabilitation	Comments
1	Miwale W/S	Lulindi	Miwale (Mwiti W/S)	306	78-79		3	1	10.8	1	0	160		1	0		8000		2	0	II	Too big pumps
2	Mwiti W/S	Chikundi	Saurimoya Kachepa Mapale Mpindimpi Mkajamila Chisegu Masasi town	8922	78-79		3	2	36.9	1	0	500		0	0	0	28000	20	1,3	180	I	Taps in poor condition. Pipes need repair
3	Mwena W/S	Chikundi	Mtandi Mwena Mkaleka Chikundi Rahaleo Mbaju Chigugu Mbemba Mandiwa Chikukwe Liloya Namakongwa Chanikanguo	29657	73-79		3	1	72.0	1	0	700		0			44000		1,6	180	I	Pipes, taps and tanks need repair
4	Liputu-Mkungu W/S	Chikundi	Liputu Mpowora Nangoo Mwongozo Mumburu Nanganga I Nanganga II Chipite Mkwera Mkungu	11580	70-80		3	1	39.6	1		600		0			41000	30	4	150	I	Sand in the intake and pipelines
5	Lulindi W/S	Lulindi	Lulindi Nagaga Mpilipili Mdibwa Mbuyni Mkaseka Luchelewa Kivukoni Chiungutwa Mvita Namalenga Luatala Mkunbululu Luagala Mitesa Msanga Ngalinje Maugura	24093	70-74		3	2	17.0	1		400		0	2		50000	60	1,3,4	180	I	Boosters and taps in poor condition Only part of the scheme getting water

MASASI

MASASI

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
									Yield			Capacity										
No	Name of the Scheme	Division	Villages covered	Population 1984	Year of construction	Under construction	Source	Quality	m^3/h	Sufficient	Treatment	m^3/d	Sufficient	Power	No of boosters	Static head m	Pipelines m	No of taps	Condition	Operating last 6 months, days	Rehabilitation	Comments
6	Chiwambo Chini W/S	Lulindi	Chiwambo chini	1000	80		3	2	17.0	1	C	192		1			1000	8	1,2	180	I	Same source as Lulindi W/S
7	Mpeta	Chiungutwa	Mpeta	1913	80		1	4	8.1	1	0	130		1			1000	6	7,5	0	Aband.	Engine bed broken, water too saline
8	Nandete	Lisekese	Nandete Nakole	2780	81		1	4	5.9	0		90		1		41,5	1000	8	2	0	II	Water slightly salty
9	Makanyama	Chiungutwa	Makanyama	789	80		1	4	1.4	1		20		1		12	500	4	2,5,7	0	Aband.	Salty water, broken engine
10	Mkululu	Lulindi	Mkululu Miba	2527	77	x	5 (3)	2	8.0	1	0	200		1			5500	2	2	0	II	Source is a dam. Treatment should be added
11	Sindano W/S	Mchauru	Sindano Licheche	2417	76		2	3,4		0	0			1			2000	8	5,2,7	0	III	Insufficient source, no spares
12	Makongonda	Mchauru	Rivango Makongonda Nakarara Kilonbero Mnavira Manyuli Mkachima Chikoropola Namombwe	11106	73-75		3	3	19.0	0	0	250		0		38	30000		1	100		Not enough water for the last villages
13	Mlingula	Lisekese	Mlingula Namkungwi	3565	79		1	1(4)	4.5	1	0	60		1			3400	7	2	30		In good condition
14	Namajani	Lisekese	Namajani Prison Namatutwe	2754	83-84		1	4	5.9	1	C	90		1			11500		1	180		Salty water
15	Chikoweti	Lisekese	Chikoweti	1488	78	x	1	4	4.5	0	0	60		1					5,7	0	Aband.	Salty water, no distribution. Not in use
16	Nanyindwa	Lukuledi	Nanyindwa	1188	80	x	1	1(4)	4.5	1	0	60		1			700		5	0	II	Pump broken
17	Nandembo	Nakopi	Nandembo Michiga	3012	78		1	1(4)	6.8	1	0	100		1			4500	7	5	0	III	Engines, pumps, pipes broken
18	Mangaka	Nanyumbu	Mangaka Kilima Hewa	5246	80		1	1(4)	10.8	1	0	110		1			4000	8	5	0	II	Engine broken
19	Ndwika	Nanyumbu	Ndwika	564	82	x	1		3.8	1	0	50		1		54	1000		5	0	Aband.	No engines, no pumps, never operated
20	Nangomba	Nanyumbu	Nangomba	2190	73-76		1	1(4)	5.9	1	0	90		1		165	4000	10	5	0	II	No engine since -82
21	Nanyumbu	Nanyumbu	Nanyumbu Mkuula Chungu	2944	76		2	4,2	1.4	0	0	20		1			8000	7	5	0	Aband.	No engine, water too salty

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
									Yield			Capacity										
No	Name of the Scheme	Division	Villages covered	Population 1984	Year of construction	Under construction	Source	Quality	m^3/h	Sufficient	Treatment	m^3/d	Sufficient	Power	No of boosters	Static head m	Pipelines m	No of taps	Condition	Operating last 6 months, days	Rehabilitation	Comments
22	Lukula	Nanyumba	Lukula	1378	75		1	4						1				5	5,7	0	Aband.	Water salty, no pumps, no engines
23	Mikangaula	Lisekese	Mikangaula Kilimahewa Kilosa	5576	82		1	4	9.0			140		1			4000	12	5	20	I	Salty water
24	Makulani	Lisekese	Mkarakate Makulani Sululu Namatumbusi	8055	74		5	4(2)	12.5	1	0	150		1		80	13000	12	2	0	II	Water salty. Source a dam: treatment to be added. Pipes need repair
25	Chiwale	Lisekese	Chiwale	1284	81-82		2	1		0	0			1			1200	3	2	0		Water insufficient
26	Masasi	Lisekese	Masasi town	19700	56 79-80		1 70% 5 30%	1 2	40.0 15.0	1	0 1	950					15000		1,3 1,5	90 90	I I	One engine broken Several engines and pumps broken

MASASI

MASASI

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
									Yield			Capacity										
No	Name of the Scheme	Division	Villages covered	Population 1984	Year of construction	Under construction	Source	Quality	m^3/h	Sufficient	Treatment	m^3/d	Sufficient	Power	No of boosters	Static head m	Pipelines m	No of taps	Condition	Operating last 6 months, days	Rehabilitation	Comments
1	Naumbu W/S	Naumbu	Kitope Naumbu Kusini Naumbu Shuleni Mkungu Pemba	2300	73		3	2	3.6	0	0	60		1		30	12000	16	5,7	0	III	Unsufficient source. Broken pipeline (under repair)
2	Msangamkuu	Ziwani	Sinde Msangamkuu	3294	72		2	2	10.0	0	0	60		1		23	8400	21	1,3	40	II	2nd pump unit under install., taps broken, source insuff.
3	Kitere W/S		Kitunguru Chemchem Lilido Nakada Chekeleni	4979	72-78		1	1	144.0	1		240		1			16500	13	2,3	30		No spares, good source
4	Namuhi W/S	Mpapura	Namuhi Libobe Utende	4069	81		1		13.5	0		200		1			10000	10	7	0	III	Borehole collapsed 1984 No machines.
5	Mpapura	Mpapura	Mpapura	2018	82		1		7.9	0		100		1			1700	7	5	0	III	No machines, never operated, avaiting eletriced installation.
6	Mdambi W/S	Mpapura	Ndambi Ndumbawe	2525	80		1	1	13.5	1		200		1			2000	10	2	30		Good condition
7	Dihimba W/S	Dihimba	Dihimba Mpondomo	3227	80		1	1	16.2	1		250		1			2100	8	2,5	10	II	Broken engine
8	Mbuo	Mpapura	Mbuo Namkogoli Mgao Imekuwa Kisiwa Lisoho Likonde Nanguni Likonde Godauni Mkunwa	7859	79		1,2	1	29.7			250		1			23000	20	5,7	0	Aban.	No machines since -81, poor source.
9	Nanyamba W/S	Nanyamba	Nanyamba Namkuku	3000	70		2,5	2		1				1			3000	7	5,7	0	Aban.	Polluted source, dam collapsed no machines since -81.
10	Mtiniko W/S	Nanyamba	Mtiniko	2130	77		1	1		0				1			4500	5	5,7	0	III	B/H collapsed, no machines since -81.
11	Nanguruwe	Ziwani	Nanguruwe	2090	72		2	2	0.8	0		20		1			1500	6	7,5	0	Aban.	Source dry, broken machine
12	Arusha Chini W/S	Kitaya	Arusha Chini Arusha Juu	1460	78		1	1	3.3	1		80		1			5000	7	2	20		Not oper for many years. Fair condition
13	Ziwani W/S	Ziwani	Ziwani Msakala Mkwajuni	2470	77		1	1	3.5	0		20		1			3000	10	2,5	5	I	Engine too small
14	Namindondi W/S	Ziwani	Namindondi Mtendachi Madimba Angoji	3678	77		1	1	12.0	1		200		1			10500	16	2	30		Good condition

MTWARA

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
									Yield			Capacity										
No	Name of the Scheme	Division	Villages covered	Population 1984	Year of construction	Under construction	Source	Quality	m^3/h	Sufficient	Treatment	m^3/d	Sufficient	Power	No of boosters	Static head m	Pipelines m	No of taps	Condition	Operating last 6 months, days	Rehabilitation	Comments
15	Kitaya W/S	Kitaya	Kitaya Mayembe Kiromba Juu Kiromba Chini	7286	72-79		2	2		1		200		1	1		4000	20	7	0	II	Source L. Chidya. Water level too low during dry season. Needs redesign.
16	Mahurunga W/S	Kitaya	Mahurunga Police station & hospital only	200	70		2	2	1,3	0		30		1			1500		7	30	III	New source needed, pump broken
17	Mbawala Chini	Mayanga Ziwani	Mduwi Maili Kumi Nalindele Mbawala Chini Nyengedi Nanyati Kawawa Nachenjele	5186	81-82		1	1		1		360	1	1	1	140	10600	10	1,3	120		Maintaned by F.W. Power problems
18	Nanyamba	Nanyamba	Nanyamba Chikwaya Mnyahi Milangominne Mnyawi Sokoni Namtumbuka Mnyawi Mnongodi Namakuku Dinyecha	17893	78-80		1	1		1		560	1	1	1	160	43000	84	1	120		Maintaned by F.W. Boreholes under repair.

MTWARA

NEWALA

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
									Yield			Capacity										
No	Name of the Scheme	Division	Villages covered	Population 1984	Year of construction	Under construction	Source	Quality	m^3/h	Sufficient	Treatment	m^3/d	Sufficient	Power	No of boosters	Static head m	Pipelines m	No of taps	Condition	Operating last 6 months, days	Rehabilitation	Comments
1	**Chiwambo Juu**	**Newala**	Mitahu Kamkundane Chiwambo Juu Nambunga Mkoma I Mnauke Chitekete Mnambe Mchangani Minjale Malatu Juu Nakahako	11436	80		1	1		1		560		1	2	500	21000		2	0		Difficult to operate due to several pumpings
2	**Majembe Juu**	**Chilangala**	Majembe Juu Mnima Mnyambe	3435	75-77		3	1	7.2	1				1	1		7500	20	4,3	15	II	Broken rising main and booster engine
3	Mahuta W/S	**Mahuta**	**Mahuta**	15760			3	1	4.0	0				1	0	240	5000	3	2	100		Yield of the source too small
4	Kitangari	Kitangari Litehu Namikupa Mahuta		120000	78-	x	1	1	500	1	1	5000	1	1	1	230	70000		1	180		Operated by FW
5	Mkunya-Makote	Newala	Newala + 50 villages	95000	53		2	1	80	0	1	2000	0	1	1	700	70000		2,5,6	50 partly	1 (partly	Most of the scheme does not get water. operating 50 % of time: 0 operational : 30.000 non operational : 65.000
6	Mwinji	Chilangala	Chilangala Navanga Miuyu Namdinba Mkudumba Mikumbi	72	1982-	x	3	1	200	1	0		1	1	2	395	30000			0		Under construction with CCT's assistance

NEWALA

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
									Yield			Capacity										
No	Name of the Scheme	Division	Villages covered	Population 1984	Year of construction	Under construction	Source	Quality	m^3/h	Sufficient	Treatment	m^3/d	Sufficient	Power	No of boosters	Static head m	Pipelines m	No of taps	Condition	Operating last 6 months, days	Rehabilitation	Comments
1	Kilwa Kivinje	Pwani	Kilwa Kivinje	6161	70,76		3	1	6	1	0	140	0	0	0	0	5000	9	1,4	180	I	DP's need improvement
2	Songo-Songo	Pwani	Songo-Songo	1300	75		2	2,4		0	0		0	1	0	25	3500	9	5			Intake a cave. Engine broken
3	Singino	Pwani	Singino	3300	83-84	x	3	2	3	1	0	48	0	1	0	90	4500	2		180		Distribution under constr.
4	Nangurukuru	Pwani	Nangurukuru	200	81-83	x	3	2	2	0	0	32	1	1	0	164	5800		5	0	I	Pump not suitable, Distribution not complete
5	Migeregere	Pwani	Migeregere	1132	68		1	1	2	1	0	32	1	1	0		1060	5	5	50	II	Pump not suitable,water not reaching the reservois. New pumps purchaced.
6	Ruhatwe	Pwani	Ruhatwe Kikole	3300	79-82		1	1	40	1	0	100	1	1	0		4500	7	3	0	II	
7	Njinjo	Njinjo	Njinjo	3400	79-84	x	2	1	0.3	0	0	5	0	1	0	18	6300	12	7,2	180	I	Source not sufficinet. Supplies dispensary only. To be improved
8	Kisima Mkika	Njinjo	Kisima Mkika	1400	79-83		1	2		0	0		0	1	0		2600			0	Aband.	B/H dry. Scheme not in use
9	Likawage	Nanji-rinji	Likawage	2200	75-76		2	2	0.6	0	0	10	0	1	0	40	1500	7	5	10	III	Pump under repair
10	Nanjirinji	Nanji-rinji	Nanjirinji A	1200	80-84	x	2	2	0.2	0	0	5	0	1	0		4000	8	1,7	180	I	Source insufficient
11	Pande	Pande	Pande	4000	67		1			0	0		0	1	0		2000	6	5,6,7	0	Aband.	B/H dry. Not oper. since -80
12	Namakongoro	Pande	Namakongoro	1600	79-80		1	3	6	1	0		1	1	0		1800	6	5,7	0	Aband.	Not oper. since -82. B/H dry. Pumphead broken
13	Lihimalyao	Pande	Lihimalyao	3120	79-80		(1),2	2,3		1	0	60	0	1	0		5000	9	7,2	20	II	People don't like B/H water, pump installed in the local pit
14	Mtandi-Kiranjeranje	Pande	Mtandi Kiranjeranje	3960	70-74		1	1	7	1	0	100	1	1	0	50	6000	15	2	40	I	New pump needed.
15	Kiwawa	Pande	Kiwawa	1600	74-75		2	1	0.2	1	0	5	0	1	0		5500	7	2	0	I	Operational
16	Kilwa-Masoko	Pwani	Kilwa-Masoko Mkawanyule Mpara	8300	48-50		1	1	80	1	0	40	1	1,2	1	50	16000	7	1,2,3	150	I	New rising main needed
17	Mtanga	Pwani	Mtanga	200	67		5	3	1	1	0	10	1	1	0	20	1000	4	5,6	0	III	To be included in Kilwa-Masoko W/S
18	Tingi	Miteja	Tingi Njianne	3300	80		2	1	150	1	0	150	1	1	0	20	4500	14	1	40	I	Pumphouse to be shifted to a higher place.

KILWA

LINDI

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
									Yield			Capacity					m					
No	Name of the Scheme	Division	Villages covered	Population 1984	Year of construction	Under construction	Source	Quality	m^3/h	Sufficiency	Treatment	m^3/d	Sufficiency	Power	No of boosters	Static head	Pipelines	No of taps	Condition	Operating last 6 months, days	Rehabilitation	Comments
1	Kitere-Nyangamara	Nyangamara	Kitere Litipu Nyangamara Mbawala Linoha Nahukahuka Lipome	6000	79		3	1	150	1	0	150	1	1	1		18000	13	2	0		Not operated since Mar. 84 Poor maintenance
2	Madingo	Nyangamara	Madingo	1450	74		2	2,4	9	1	0	150	1	1	0		4500	5	5,4	0	II	Not oper. since 82. Pump broken
3	Namichiga	Ruangwa	Namichiga	2447	82	x	1	1			0	60	1	1	0	71	1100	1		0		No engine, no distribution
4	Mandawa	Mandawa	Mandawa Chikundi Mchichili Mtondo Nahanga	6522	75-79		3	1	35	1	0	400	1	0	0	0	12000		1,4	180	I	
5	Lichwachwa	"	Lichwachwa Chibula Muhuru	1910	77		3	2	10	1	0	150	1	1	0	65	8700	9	5	0	III	Source polluted. Engines to be replaced
6	Chilangalile	Ruangwa	Chilangalile	1160	77	x	1	1	5	1	0	80	1	1	0		1000	1	6	0	II	Temporary tank, no distribution
7	Nkowe	Mnacho	Nkowe Mitope	3754	77		2	2	2,5	0	0	50	0	1	0	50	3500	12	2	30		Source polluted
8	Mnacho	"	Nandagala Ngau Chimbila	6982	71		3	2		0	0		0	0	0	0	10000	10	1,4	180	II	Pipeline to Chimbila broken since -71. Spring dries up during dry season
9	Likongo	Mchinga	Likongo Mitoto	1300	54		5	2	4	1	0	100	1	1	0		5000	5	1,3	180		Private W/S (Sisal estate)
10	Mitwero	"	Mitwero	1424	54,77		5	2	10	1	0	200	1	1	0		4000	2	5	0		Formerly privat W/S. Engine broken.
11	Kikwetu	"	Kikwetu Mbanja	3162	54		5	2	10	1	0	200	1	2	0				1,4	180		Private W/S (Sisal estate), Mbanja village served by gravity line
12	Kitomanga	Mipingo	Kitomanga	3981	73		1	1	15	1	0	120	1	1	0	43	1700	10	2,4	10	I	DP's in poor condition
13	Namikongo	"	Namikongo	908	82	x	1	1		1	0		1	1	0		1000	1	2,5	0	II	Temp. tank. No distrib. engine broken
14	Kinengene	Ngapa	Kinengene Chikonji	4350	79	x	1	1			0		0	1	0		10000	7	5,6	0	III	Two separate rising mains. Temporary tanks. No distribution
15	Nanyanje	Nangaru	Nanyanje Jangwani	1630	82-83	x	2	3		0	0		0	1	0		5000	7	2,3	0		Never operated. Line to Jangwani not completed. Source badly polluted
16	Milola	Milola	Milola Legezamwendo Kinyope Chikwikwi	7463	82	x	3	1		1	0	250	1	2	0				1	180		Distribution system under construction

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
									Yield			Capacity										
No	Name of the Scheme	Division	Villages covered	Population 1984	Year of construction	Under construction	Source	Quality	m^3/h	Sufficiency	Treatment	m^3/d	Sufficiency	Power	No of boosters	Static head m	Pipelines m	No of taps	Condition	Operating last 6 months, days	Rehabilitation	Comments
17	Rutamba	Milola	Rutamba Chitonji	6725	64		3	1	20	1	0		0	1	0		3500		2	0		New engine installed -76
18	Pangaboi	Sudi	Pangaboi	900	82	x	1	1		1						30	1000	1	2	10		Distibution under construction
19	Mkanga	Rondo	Mkanga	1760	82	x	2	2		1	0		1	1	0		3000					Under construction
20	Rondo	"	Mnara Ntene Mihanga Ntauna Mtakuja Chiponda Chiodya	9487	81		4	2	200	1	0	400	1	1	2	470	17000		2,5	0	II	Great pumping head; uneconomic scheme. No other sources
21	Kiwalala	Mingoyo	Kiwalala	1770	71		2	2	5	0	0		1	1	0		1600		5,6	0	Aban.	Not operated since -79
22	Mtua	Mtama	Mtua Longa	5565	65,78		2				0			1	0		4500	11	2,6	0	III	Not operated since Feb. 84
23	Nyengedi	"	Nyengedi Luwale Mbalala	4954	71-76		4	3	200		0		1	1	0	40	5500	4	5,6	0	III	Not operated since -82. Pumps. engines, distribution broken
24	Mtama	"	Mtama	1020	57		4	3,4		0	0		0	1	0		2600		5,6,7	0	Aban.	Not operated since -80
25	Mahiwa	"	Mahiwa	1270	70		2	2		1	0		1	1	0				5,6	0	III	Not oper. since -82. Machines broken
26	Nanganga	Mnacho	Nanganga	959	83	x	3		10	1	0		1	2			4000		(1)			Partly operating. Scheme extension from Mumburu (Masasi district)
27	Chienjele	"	Chienjele Namakuku	2716	77	x	2	5	1	0	0	20	0	1	0		12500		2,4	0	Aban.	Not oper. since -83. Water saline, new source to be found
28	Madangwa	Sudi	Madangwa Mtegu	2770		x	2	4		0	0			1	0		2000					Not operating
29	Ruangwa	Ruangwa	Ruangwa Liuguru	6965	80-81		1,2	1	40	1	0	640	1	1	0		11000	13	1,2	40		
30	Simana	Mingoyo	Simana Nampunga	1269	78-79		2	1	100	1	0	280	1	1	0		8500	10	1,2	40		
31	Mnazimmoja	Mingoyo	Mnazimmoja Mingoyo Mahumbika Mkwaya Namunda Ruhokwe Mnolela Zingatia	15670	81-84		1	1	40	1	0	2500	1	2,1	1		19000	43	1,5	180	I	Booster pumping not functioning proberly (14.000served)

LINDI

LIWALE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
									Yield			Capacity										
No	Name of the Scheme	Division	Villages covered	Population 1984	Year of construction	Under construction	Source	Quality	m^3/h	Sufficient	Treatment	m^3/d	Sufficient	Power	No of boosters	Static head m	Pipelines m	No of taps	Condition	Operating last 6 months, days	Rehabilitation	Comments
1	Liwale	Liwale	Liwale town Liwale B	11037	66		4	2	40	1	0	200	0	1	0	70	8000	24	3	90	I	Water source, pumping to be improved, AC-rising main to be replaced
2	Barikiwa	Makata	Barikiwa	1260	78	x	2	2		0	0		0	1	0	54	500	1	5	0	?	Never operated, no distribution
3	Mbaya	Liwale	Mbaya Kichonda	1431	80		4	2	Liw. river	1	0	80	1 0	1	0		7000	7	2	10	III	Second pumping unit broken
4	Likombora	"	Likombora	678	79		2	3	0,5	0	0	1000	0	1	0	43	1800	7	5,7	0	III	Polluted source. Machines to be changed. New source needed.
5	Kipule	"	Kipule	1640	82		2	2	4	1	0	60	1	1	0	77	2700	3	3	10	II	Few spares missing
6	Mangirikiti	"	Mangirikiti	970	77		2	2		0	0	60		1	0	70	2300	6	3	10	II	Pump worn out, source poor
7	Ngunja	"	Ngunja	790	81		2	2		1	0	60	1	1	0	42	1200	5	5	0	I	Engine foundation broken
8	Mikunya	"	Mikunya	1640	83-84	x	1	1		1	0			1	0		1500	6		0		Under constr. no engine
9	Ngongowele	"	Ngongowele	1730	70		2	2		0	0		1	1	0	60	2000	6	5	0	II	Pumps broken. Difficult to maintain, source to be improved
10	Kibutuka	Kibutuka	Kibutuka	1310	80-84		1	5		1	0			1	0		1500	6	6,7	10	(III)	Water saline. Broken pipes, new source
11	Kiangara	"	Kiangara Dodoma	1391	80		1	1		1	0	80	1	1	0		3000	7	2,6	10	II	Partly working, water not reaching Kiangara. Rising main broken.
12	Makata	Makata	Makata	1260	84	x	2	2	2	1	0			1	0	68	2000			0		Under constr., no pump, no distr. no sourc
13	Ndapata		Ndapata	996	77		2				0			1	0						Aband.	Never operated. Impossible to maintain due to the distance
14	Mpigamiti	Liwale	Mpigamiti	1880	78		2													0	Aband.	Difficult access. Village location changed.
15	Kipelele	Kibutuka	Kipelele	667	78	x	1	1		1	0		1	1	0	83	200	0	2	10		Temparary tank. Rising main not completed. No tank, distribution.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
									Yield			Capacity										
No	Name of the Scheme	Division	Villages covered	Population 1984	Year of construction	Under construction	Source	Quality	m^3/h	Sufficient	Treatment	m^3/d	Sufficient	Power	No of boosters	Static head m	Pipelines m	No of taps	Condition	Operating last 6 months, days	Rehabilitation	Comments
1	Kipara	Mnero	Kipara	623	84	x	1	1	9.5	1	C		1	1	-		0	0				B/H + pumphouse ready, no pumps
2	Nalengwe	Nanbambo	Nalengwe	820	78	x	1	4			0			1	-	20	50	0	1	30		Temporary tank. No distribution
3	Mtua	"	Mtua	2448	75		1	1		1	0		1	1	-		800	7	2	25	III	2nd B/H out of order. Oper. 1 day/week
4	Mkotokyana	"	Mkotokyana	1668	80		1	4		1	0		0	1	1		8000		3,7	0	III	Capas. not suff., B/H screen broken
			Mandai																			
5	Ndomondo	"	Ndomondo	2934	77-78	x	1	1	13.0	1	0	200	1	1	1	78	7000	6	2	0	II	Booster + ext. to Ndomoni not constructed
			Ndomoni																			
6	Naipanga	"	Naipanga	3849	79		1	1	6.8	1		100	1			38	4000	11	2	0		Fully operational
7	Mpiruka	"	Mpiruka	1728		x	1	1		1	0		1	1	-		3000	1	2,3	0	I	No distribution
8	Naipingo	"	Naipingo	4499		x	(1)2	5,2	0.5	0	0	10	0	1			0	0	5,6,7	0	III	No distribution. Engine stolen -81
9	Mitumbati	Nanbambo Mjini	Mitumbati	2396	65-72		1	5		1	0			1	-		8000	3	5,6	0	III	Engine stolen, not oper. since 1982
			Mwenge																			
10	Chimbendenga	Kilima-rondo	Chimbendenga	1062	78-80		1	1		1	0		1	1	-	25	3000	7	2,4	0	I	Pumphouse and DP's in poor condition
11	Mbondo	"	Mbondo	1300	73		2	2	1.0	0	0	20	0	1	-	34		8	5	0	Aband	Never worked
12	Nahimba	"	Nahimba	1741			4	2		1	0			1	1	79	3700		2,3	0	III	Source not well protected
			Nakalonji																			
13	Kilimarondo	"	Kilimarondo	1100	77-78		2	2		1	0		1	1	-	28	3400	10	2,3	0	II	Not operated since 1983, poor quality
14	Kiegei	"	Kiegei	1870	81-	x	2	2		1	0			1	-					0		SW + pumphouse completed, no pumps
15	Chiola	Ruponda	Chiola	2885	78-79		1	1	13.0	1	0	200	1	1	-	58	6000	19	2	0		Operational
			Mtimbo-Nachingwea																			
			Mtimbo-Lindi																			
16	Mkoka	"	Mkoka	1520	77	x	1	1			0			1	-		50	1	2	30		Temporary tank near pumphouse
17	Rupota	"	Rupota	1722	74-75		1	1		1	0		1	1	-	59	7000	10	2,5,4	0	III	Pump broken, DP's in poor condition
			Ikungu																			
18	Ruponda	"	Ruponda	7672	73		2	2		1	0		1	1	-	57	2500		5,6	0	III	Notoperated since -80. Machine chinese - no spares. Structures in good condition poor water quality
			Marambo																			
			Litula																			
			Chingunduli																			
			Mandawa																			
			Ntila																			
19	Rweje	"	Rweje	1100	77-78	x	1	4		1	0		1	1	-	20	100	1	2	30		Temporary tank, no distribution
20	Mnero	Mnero	Mnero	3073	71		1	4		0	0		0	1	-	30	7500	7	5,6	0	III	Not operated since -81. Engine broken
			Miembeni																			
			Mkonjela																			

NACHINGWEA

NACHINGWEA

NACHINGWEA

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
									Yield			Capacity										
No	Name of the Scheme	Division	Villages covered	Population 1984	Year of construction	Under construction	Source	Quality	m^3/h	Sufficient	Treatment	m^3/d	Sufficient	Power	No of boosters	Static head m	Pipelines m	No of taps	Condition	Operating last 6 months, days	Rehabilitation	Comments
21	Mnero-Ngongo	Ruponda	Mnero-Ngongo	2400	72		2	2,4		0	0		0	1	-		3000	10	5,6	0	Aband.	Not operat. since -81. Engine, pipes broken
22	Kitandi	"	Kitandi	834	79		1	4		1	0		1	1	-	49	3200	4	4	20	II	Pipes broken
23	Lionja	Lionja	Lionja A	3108	73		2	2		1	0		1	1	-	112	2400	7	2	20	I	Source to be improved
24	Namikango	"	Namikango, Nankunde, Mpute	4822	82		1	2	10	1	0	200	1	1	-	42	11000	16	5	0	II	Not oper. since -83. Engine, pumphouse broken
25	Matekwe	Kilima-rondo	Matekwe	3085	74-75		5	2		1	0			1	-				5,6	0	Aband.	Not oper. since -77. Very poor conditio
25	Nachingwea	Nambambo	Nachingwea town	24324 (12100)	54		1	1,4, 5	60 (100)	1	0	64	1	1,2		120	30000		1,2,6, 7	150	I	Several pumps out of order, 2 B/H field too saline. Distribution in a bad shape
			Stesheni																			
			Namatula																			

PRECIPITATION STATIONS

Mtwara Region

Station	Reg.No	Latitude	Longitude	Years of operation	Mean annual rainfull,mm
Masasi Mission	1003800	10.42	38.49	61	901.7
Masasi Bomani	1003802	10.44	38.48	38	964.6
Mkomaindo Hospital	1003810	10.55	38.45	1	
Masasi Girls Secondary School	1003814	10.40	38.50	3	
Lumesule	1003818	10.55	38.07	4	
Chiungutwa	1003820	10.53	38.58	0	
Chingulungulu	1003821	10.43	38.75	3	
Nandete	1003822	10.57	38.48	4	
Nangomba	1003824	10.54	38.31	6	852.9
Newala Bomani	1003902	10.57	39.18	46	1003.1
Ndanda	1003903	10.30	30.02	43	952.6
Luagala Mission	1003913	10.32	39.30	36	990.1
Nanyamba Mission	1003914	10.42	39.51	38	1111.8
Tandahimba	1003916	10.44	39.38	16	1035.9
Kitangari	1003917	10.44	39.21	28	911.6
Ndwika	1003919	10.50	39.08	35	930.6
Lidumbwe	1003927	10.55	39.20	15	1456.0
Mtopwa	1003931	10.42	39.23	24	1090.1
Njengwa	1003934	10.35	39.42	4	
Mpapura	1003935	10.16	39.57	1	
Dihimba	1003936	10.25	39.57	8	859.6
Makong'onda	1003937	10.59	39.17	3	
Kitere Livestock	1003938	10.21	39.44	3	
Mtiniko	1003939	10.36	39.57	3	
Mikumbi	1003940	10.34	39.07	3	
Chidya	1003941	10.37	39.01	6	1114.9
Makote Water Supply	1003942	10.57	39.20	19	1052,7
Mnongoni	1003943	10.47	39.58	0	
Mkwiti	1003944	10.25	39.22	0	
Mihambwe	1003945	10.49	39.48	0	
Mchichira	1003946	10.54	39.34	2	
Mkoma	1003947	10.49	39.12	4	
Kiduni F.D.C.	1003950	10.56	39.19		
Mwita S. Estate	1004001	10.17	40.05	48	913.6
Mtwara Prt Works	1004003	10.15	40.13	23	927.3
Mtwara Airport	1004004	10.21	40.11	32	1143.9
Kitaya	1004005	10.38	40.10	3	
Nachenjere	1004006	10.27	40.12	8	1147.1
Naliendele Agromet	1004007	10.22	40.10		
Mahurunga Lime Products	1004008	10.32	40.16		
Mtwara Maji	1004009	10.22	40.09	7	1079.8
Nanyumbu	1013801	11.08	38.31	5	1285.4
Nakopi	1013803	11.04	38.13	4	
Masuguru	1013804	11.22	38.26	5	796.4
Sindano Village	1013901	11.06	39.06	6	627.8
Makonga Lysimeter				6	1336.6
Masasi Pumphouse				5	1094.5

Precipitation Stations

Lindi Region

Sation	Reg.No	Latitude	Longitude	Years of operation	Mean annual rainfull, mm
Kipatimu Mission	983804	8.31	38.55	31	1080.3
Njinjo	983805	8.49	38.52	8	1191.7
Kandawale	983807	8.38	38.47	5	805.1
Kilwa Kivinje	983900	8.45	39.25	54	1045.2
Kilwa Masoko	983904	8.51	39.31	28	1020.4
Miteja	983907	8.36	39.15	1	
Kinjumbi	983908	8.24	39.10	1	
Kikole	983909	8.46	39.19	1	
Liwale Mission	993700	9.47	37.55	41	880.0
Liwale Hydromet	993701	9.46	37.57	6	897.9
Mlembwe	993702	9.36	37.39		
Mitonono	993802	9.75	38.55	9	959.4
Kimambi	993803	9.26	38.26		
Kikwetu S. Estate	993901	9.51	39.44	49	864.3
Mnyangala	993908	9.35	39.20	9	1070.7
Nanjirinji	993909	9.39	39.04	5	933.6
Pande	993910	9.08	39.35	1	
Naikokwe	993911	9.07	39.03	4	
Mandawa A	993912	9.22	39.27	5	891.1
Kiwawa	993913	9.10	39.20	0	
Lihimalyao	993914	9.20	39.38	2	
Mipingo	993915	9.37	39.28	4	
Mandawa B	993916	9.55	39.08	1	
Nangaru	993917	9.50	39.29	2	
Mchinga	993918	9.44	39.42	0	
Likawage	993919	9.14	39. 0	0	
Lindi Maji	993920	9.59	39.42	7	1103.0
Ngongowele	1003708	10.05	37.48	6	914.4
Mnero Mission	1003803	10.11	38.38	33	889.7
Nachingwea Part Time	1003807	10.21	38.45	32	944.4
Kilimarondo	1003816	10.33	38.00	9	1219.1
Lionja Baraza	1003817	10.10	38.30	6	959.9
Nachingwea J.K.T.	1003819	10.26	38.35	7	640.0
Ndomoni	1003819	10.33	38.48	4	778.8
Ruangwa	1003825	10.04	38.56	2	
NAFCO Nachingwea	1003826	10.26	38.45	2	
Chimbendenga	1003827	10.23	38.19	0	
Lindi Bomani	1003906	10.00	39.42	40	930.6
Narunyu Mission	1003912	10.10	39.33	30	944.6
Mahiwa COM College	1003920	10.21	39.16	16	875.4
Ntene Rondo	1003923	10.08	39.15	29	1173.8
Mnacho	1003929	10.16	39.01		
St. Cyprian Coll. Rondo	1003932	10.10	39.16	17	989.5
Chilala F.D.C.	1003933	10.02	39.30	6	1102.5
Nyengedi	1003948	10.15	39.20	3	
Madangwa	1003949	10.12	39.48		
Singira	993828			5	956.4
Nahoro				6	1542.8

PRECIPITATION DURING THE RAINY SEASON 1976 - 1983

	Stations	
1.	Kipatimu Mission	98.3804
2.	Kilwa Kivinje	98.3900
3.	Liwale Hydromet	99.3701
4.	Mitonono	99.3802
5.	Kikwetu Sisal Estate	99.3901
6.	Mnyangala	99.3908
7.	Nachingwea	100.3807
8.	Kilimarondo	100.3816
9.	Newala Boma	100.3902
10.	Ndanda Mission	100.3903
11.	Lindi Boma	100.3906
12.	Luagala Mission	100.3913
13.	Nanyamba Mission	100.3914
14.	Mtene Rondo	100.3923
15.	Mtopwa	100.3931
16.	Mtwara Port	100.4003
17.	Mtwara Airport	100.4004
18.	Tunduru	101.3700

MONTHLY RAINFALL DATA

STATION: KIPATIMU

REG.NO: 98.3804

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1976-77	19.1	1.7	1.2	42.4	5.9	69.7	120.1	49.0	180.2	140.0		0.0	
1977-78	1.3	12.2					113.7	35.1	168.3	131.7	36.1	8.4	
1978-79	0.0	11.7	13.0	9.3	122.7	244.3	106.7	143.3	347.4	223.4	115.7	27.0	1337.5
1979-80	13.6	12.8	7.5	13.6	30.5	204.7	118.2		72.9	77.8	106.2	0.0	
1980-81	0.9	6.3	7.7	20.2	115.7	160.9	88.3	32.2	151.0	82.4	97.2	0.0	762.8
1981-82	0.0	8.2	6.0	11.9	6.0	204.0	37.3	14.4	181.8	89.4	120.0	3.7	682.7
MEAN	5.8	8.8					97.4		183.6	124.1		6.5	927.7

Long time mean: 1080.3 (31 yrs)

STATION: KILWA KIVINJE

REG.NO: 98.3900

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1976-77							170.4	24.1	205.1	206.8	75.4	3.1	
1977-78	1.0	9.2	48.6	37.0	121.0	168.6	121.9	44.9	196.9	107.2	32.2	36.7	925.2
1978-79	0.0	33.4	3.9	39.7	215.5	252.8	174.3	166.8	222.0	299.5	140.7	50.2	1598.8
1979-80	14.2	3.8	45.9	9.5	49.7	159.5	232.5	27.6	41.6	72.4	49.5	0.0	706.2
1980-81	8.3	4.6	3.9	3.7	77.6	164.1	90.5	125.9	202.1	89.9	72.0	27.5	870.1
1981-82	0.6	19.6	10.3	10.6	34.1	326.3	17.1	43.0	171.7	164.0	149.1	22.4	968.8
1982-83	10.5	3.1	0.0	73.1	39.6	231.7	93.6	158.5	67.8	231.4	272.3	8.0	1189.6
MEAN	5.8	12.3	18.8	28.9	89.6	217.2	128.6	84.4	158.2	167.3	113.0	21.1	1045.2

STATION: LIWALE METEOROLOGICAL STATION

REG.NO: 99.3701

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1976-77							162.0	46.8	134.1	105.7	37.4	0.0	
1977-78	0.0	0.0	1.4	13.3	70.3	96.0	127.3	104.5	158.6	86.9	6.2	0.0	664.5
1978-79	0.0	0.0	0.0	0.0	47.0	168.8	167.2	401.8	216.1	210.1	2.7	0.0	1213.7
1979-80	1.9	0.0	0.0	0.0	18.5	191.2	324.8	57.7	241.7	179.7	28.2	0.0	1043.7
1980-81	0.0	0.0	0.3	13.4	32.2	53.2	130.1	162.0	100.3	56.5	87.4	0.0	635.4
1981-82	0.0	0.0	0.0	0.3	29.7	168.2	82.4	131.9	292.6	69.5	128.3	0.4	903.3
1982-83	0.1	0.0	0.0	44.7	170.0	116.4	214.6	236.3	181.8	94.8	69.1	4.7	1132.5
MEAN	0.3	0.0	0.3	12.0	61.3	132.3	172.6	163.0	189.3	114.7	51.3	0.8	897.9

STATION: MBWEMKURU MITONONO

REG.NO: 99.3802

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1976-77							126.1	72.1	145.6	181.8	21.0	0.0	
1977-78	0.0	0.3	0.4	1.6	123.1	101.4	132.8	45.4	115.8	117.8	5.6	0.0	644.2
1978-79	0.0	8.2	2.0	0.0	50.5	232.4	158.8	203.7	165.3	165.9	26.4	12.4	1025.6
1979-80	7.6	0.0	1.6	0.0	30.9	170.0	237.4	10.8	172.9	54.6	57.4	0.0	743.2
1980-81	0.0	0.4	4.4	4.4	4.0	81.0	120.4	81.6	102.6	81.6	50.8	7.8	539.0
1981-82	0.0	0.0	0.0	0.0	2.8	68.5	43.6	301.6	98.3	133.2	20.2	0.0	668.2
1982-83	2.4	0.0	0.0	1.4	58.2	106.9	80.5	46.4	232.5	98.4	52.0	42.0	720.7
MEAN	1.7	1.5	1.4	1.2	44.9	126.7	128.5	108.8	147.6	119.0	33.3	8.9	723.5

STATION: KIKWETU S.E

REG.NO: 99.3901

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1976-77	18.5	0.0	21.5	0.0	33.5	124.2	149.7	28.6	93.4	105.3	19.6	0.0	594.3
1977-78	0.0	2.0	7.3	5.5	89.3	172.9	90.0	30.5	221.9	43.8	63.4	0.0	726.6
1978-79	0.0	15.0	5.5	8.6	26.4	314.9	199.3	165.3	173.0	135.5	21.5	0.0	1065.0
1979-80	11.6	0.0	4.0	6.2	55.9	87.3	319.9	61.0	162.9	108.0	81.5	0.0	898.3
1980-81	0.0	0.0	20.9	8.9	32.9	236.8	127.6	105.2	149.1	40.0	11.5	0.0	732.9
1981-82	0.0	0.0	5.8	13.0	41.1	191.3	43.4	129.1	126.7	111.4	30.2	4.9	696.9
1982-83	6.7	1.3	56.0	31.7	51.9	174.5	150.7	117.8	79.8	99.5	182.4	29.9	982.2
MEAN	3.1	3.1	16.6	12.3	49.6	196.3	154.4	91.1	143.8	91.9	58.6	5.0	825.8
49 YEARS	4.2	4.3	11.7	20.3	50.9	145.3	167.0	116.2	164.3	137.8	34.0	8.3	864.3

STATION: MBWEMKURU MNYANGALA MONTHLY RAINFALL DATA

REG.NO: 99.3908

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1976-77							310.4	126.0	83.2	148.5	2.2	0.0	
1977-78	0.0	0.0	7.9	4.0	10.8	8.8	12.0	9.7	36.0	10.5	25.4	0.0	125.1
1978-79	0.0	1.1	2.2	0.0	20.4	317.9	132.5	254.0	258.1	174.0	47.0	6.5	1213.7
1979-80	30.5	0.0	0.0	0.0	74.0	208.4	375.9	86.5	277.5	182.0	78.0	0.0	1312.8
1980-81	0.0	0.0	7.0	10.0	14.5	336.0	178.0	145.5	40.5	7.0	14.0	0.0	752.5
1981-82	0.0	0.0	1.0	8.0	47.5	642.0	89.5	161.0	188.5	230.5	43.0	9.5	1420.5
1982-83	5.0	0.0	31.5	110.0	92.0	215.5	172.0	268.0	274.5	268.5	255.0	44.5	1736.5
MEAN	5.9	0.2	8.3	22.0	43.2	288.1	181.5	150.1	165.5	145.9	66.4	8.6	1085.7

STATION: NACHINGWEA

REG.NO: 100.3807

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1976-77	0.0	0.0	0.0	23.6	12.0	34.0	59.0	92.6	82.7	140.4	14.8		
1977-78	0.0	0.0	0.0	14.6	0.0	119.4	113.3	86.9	279.2	161.1	7.0	4.2	785.7
1978-79	0.0	0.0	0.0	0.0	145.4	172.3	267.2	266.5	164.6	126.6	36.4	7.5	1186.5
1979-80	2.4	0.0	0.0	0.0	8.3	168.3	437.6	150.6	253.3	60.7	16.7	0.0	1097.9
1980-81	0.0	0.0	6.2	2.1	1.8	142.4	95.9	54.4	97.9	96.8	27.8	0.0	525.3
1981-82	0.0	0.0	0.0	27.7	22.0	352.2	93.9	65.9	116.6	215.4	12.2	0.0	905.9
1982-83	2.2	0.0	0.0	35.5	123.8	270.1	159.5	63.2	189.1	138.6	85.0	6.5	1073.5
MEAN	0.8	0.0	1.0	13.3	50.2	204.1	175.2	111.4	169.1	134.2	28.6	3.0	890.9
32 YEARS	4.2	1.3	3.8	7.8	66.2	136.8	189.4	160.7	190.4	151.6	28.2	4.0	944.4

STATION: KILIMARONDO

REG.NO: 100.3816

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1976-77	0.0	2.0	0.0	0.7	0.0	156.4	165.4	35.4	178.9	89.4	0.0	0.0	628.2
1977-78	0.0	0.0	0.0	7.2	78.8	105.7	429.6	119.9	723.2	75.3	0.0	0.0	1539.7
1978-79	0.0	0.0	5.6	15.1	285.5	597.2	476.4	519.3	334.8	263.2	5.0	0.0	2497.1
1979-80	3.2	0.0	0.0	0.0	31.4	194.5	554.0	11.4		307.0	0.0	0.0	
1980-81	0.0	0.0	0.0	7.0	56.0	159.0	111.3	232.7	149.5	41.5	104.4	0.0	858.4
1981-82	0.0	0.0	0.0	12.3	29.5	386.4	150.3	174.4	194.0	240.3	235.4	0.0	1422.6
MEAN	0.5	0.3	0.9	7.1	80.2	266.5	314.5	182.2		169.5	57.5	0.0	1389.2

Long time mean: 1219.1 mm (9 yrs)

STATION: NEWALA

REG.NO: 100.3902

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1976-77	0.0	0.0	0.0	0.0	19.7	100.8	396.4	6.8	210.8	85.6	24.2	2.6	846.9
1977-78	0.0	0.0	2.3	0.0	102.4	161.8	182.8	178.2	235.1	68.2	0.0	0.0	930.8
1978-79	0.0	0.0	0.0	0.0	0.0	208.6	576.1	412.6	107.5	266.0	9.7	0.0	1580.5
1979-80	2.8	0.0	0.0	0.5	0.0	65.1	76.4	111.9	317.2	87.7	104.4	0.0	766.0
1980-81	20.0	0.0	0.0	5.0	40.0	155.6	79.9	222.1	103.7	23.6	6.0	0.0	655.9
1982-82	0.0	0.0	0.0	0.0	34.3	154.2	173.0	235.8	122.4	148.2	36.8	3.8	908.5
1982-83	0.0	0.0	0.0	20.2	95.8	262.0	338.2	101.7	297.3	96.8	114.2	9.3	1335.5
MEAN	3.8	0.0	0.4	4.3	45.4	167.9	260.4	181.3	199.1	110.9	42.2	2.2	1017.9
46 YEARS	3.8	2.8	4.9	8.9	35.6	174.0	240.5	195.8	195.3	107.4	30.6	3.5	1003.1

STATION: NDANDA MISSION

REG.NO: 100.3903

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1976-77													
1977-78													
1978-79													
1979-80							338.0	72.0	202.0	146.0	44.0	0.0	
1980-81	0.0	0.0	0.0	6.0	5.0	220.0	150.0	59.0	146.0	68.0	27.0	0.0	681.0
1981-82	0.0	0.0	0.0	7.0	117.3	211.3	53.0	103.0	321.5	229.5	43.0	0.0	1085.6
1982-83	5.0	0.0	0.0	15.0	87.0	230.0	159.0	159.0	308.0	211.0	59.5	14.0	1233.5
MEAN													1000.0
43 YEARS	2.2	2.5	3.6	10.6	43.2	243.7	190.8	162.5	188.9	172.4	28.5	3.7	952.6

MONTHLY RAINFALL DATA

STATION: LINDI AGRICULTURE
REG.NO: 100.3906

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1976-77	42.3	2.7	14.6	10.4	9.2	126.8	234.5	55.6	99.6	138.6	37.2	3.2	774.7
1977-78	6.5	14.5	11.1	4.0	131.5	202.5	240.9	58.0	718.0	225.6	63.9	1.0	1677.5
1978-79	30.5	10.7	23.9	14.3	0.0	219.2	334.3	222.6	378.1	276.5	66.8	35.0	1611.9
1979-80	8.0	0.0	11.0	10.0	60.9	223.7	261.6	40.1	242.2	179.7	173.1	0.0	1210.3
1980-81	0.0	0.0	38.8	134.2	79.8	152.6	168.0	136.3	132.6	71.9	6.0	0.0	910.2
1981-82	0.0	0.5	3.4	27.7	26.6	313.1	70.6	140.9	163.0	128.9	75.3	24.5	974.5
1982-83	16.3	0.8	14.3	39.8	44.1	133.3	107.9	45.8	187.1	186.2	149.0	24.8	949.4
MEAN	10.2	4.4	17.1	38.3	57.2	207.4	201.1	99.9	274.4	172.5	81.6	12.6	1176.7
40 YEARS	9.7	7.2	12.9	19.8	52.6	143.8	149.9	120.4	185.4	174.7	43.2	11.0	930.6

STATION: LUAGALA MISSION
REG.NO: 100.3913

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1976-77	4.0	0.0	1.5	18.0	91.8	160.7	152.7	347.0	155.2	102.9	9.7	1.5	1045.0
1977-78	0.0	0.0	44.0	10.2	180.0	91.6	75.8	78.7	257.2	81.1	0.0	0.0	818.6
1978-79	0.0	0.0	1.5	10.5	48.0	129.4	166.3	220.9	186.6	181.7	18.5	0.8	964.2
1979-80	7.5	0.0	0.7	12.7	48.3	118.4	287.7	32.8	234.5		279.9	0.0	
1980-81	0.0	0.0	6.0	20.0	6.9	36.1	121.1	184.1	94.8	25.7	8.2	0.0	502.9
1981-82	0.0	9.0	0.0	1.3	72.2	326.0	145.4	88.8	263.0	157.1	13.7	3.0	1079.5
1982-83	0.0	3.0	4.0	26.6	170.2	235.6	82.6	100.6	374.1	52.2	162.5	12.2	1223.6
MEAN	1.3	2.0	9.4	13.6	87.6	156.2	147.4	150.4	233.6	100.1	34.4	2.5	938.5
36 YEARS	2.6	4.7	9.3	23.6	63.3	133.3	185.4	179.0	226.3	130.9	26.8	4.9	990.1

STATION: NANYAMBA MISSION
REG.NO: 100.3914

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1976-77	18.5	2.3	1.3	9.6	56.0	153.3	184.7	133.2	175.8	135.6	20.6	1.3	892.2
1977-78	0.0	0.1	34.6	25.9	117.9	116.4	64.8	29.3	259.3	155.9	1.1	4.7	810.0
1978-79	0.0	0.0	10.3	12.0	127.0	332.1	176.1	141.4	157.8	188.1	42.7	2.9	1190.4
1979-80	3.5	0.0	2.0	0.0	17.8	248.1	438.3	96.5	341.6	123.8	69.9	0.0	1341.5
1980-81	0.0	15.9	0.0	12.2	47.3	76.0	124.8	156.9	125.6	67.3	0.0	4.9	630.9
1981-82	0.0	0.0	0.0	32.2	75.3	105.2	107.2	58.4	182.9	143.9	13.1	26.3	744.5
1982-83	2.9	10.6	8.1	32.2	154.5	344.8	130.9	148.5	242.9	185.0	198.3	12.6	1571.3
MEAN	1.1	4.4	9.2	19.1	90.0	203.8	175.3	109.2	212.3	142.8	49.4	7.5	1024.1
38 YEARS	8.5	8.2	12.9	20.3	72.5	175.7	200.8	196.6	213.2	165.6	32.6	4.9	1111.8

STATION: MTENE RONDO
REG.NO: 100.3923

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1976-77	7.5	3.0	0.0	4.4	20.1	139.2	74.3	81.6	226.0	143.2	31.5	0.0	730.8
1977-78	9.0	11.1	10.3	3.8	52.9	168.1	136.6	48.9	234.8	138.2	6.8	16.3	820.5
1978-79	0.0	1.5	13.0	9.7	127.5	308.1	391.9	198.5	290.0	. .	30.9	2.9	
1979-80	11.4	0.8	2.2	1.1	3.6	207.9	210.7	158.9	452.2	264.2	69.0	0.0	1382.0
1980-81	2.8	3.5	0.0	31.2	15.0	143.1	145.3	127.1	102.8	56.9	61.3	1.5	690.5
1981-82	0.0	1.7	0.0	47.2	29.1	179.3	115.1	99.3	358.8	165.4	52.5	18.8	1067.2
MEAN	5.1	3.6	4.3	16.2	41.4	191.0	179.0	119.1	277.4		42.0	6.6	938.2

Long time mean: 1173.8 mm (29 yrs)

MONTHLY RAINFALL DATA

STATION: MTOPWA
REG.NO: 100.3931

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1976-77	0.2	0.0	1.6	0.4	31.0	37.3	164.6	20.3	285.7	75.5	6.3	0.0	622.9
1977-78	0.0	4.1	54.3	15.6	104.2	83.2	118.7	71.3	192.7	158.9	0.0	0.0	803.0
1978-79	0.0	2.0	5.0	23.7	87.4	272.7	331.6	234.1	318.7	102.4	68.8	5.0	1451.4
1979-80	9.3	0.0	0.0	0.0	19.7	137.4	214.5	90.9	188.1	196.3	49.5	0.0	905.7
1980-81	0.0	0.2	4.4	28.2	58.9	117.8	67.0	112.6	103.5	36.5	5.7	0.0	534.8
1981-82	0.0	14.6	0.0	32.8	43.7	308.9	138.1	139.4	188.0	91.4	29.4	19.1	1005.4
MEAN	1.6	3.5	10.9	16.8	57.5	159.6	172.4	111.4	212.8	110.2	26.6	4.0	887.2

Long time mean: 1090.1 mm (24 yrs)

STATION: MTWARA PORT

REG.NO: 100.4003

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1976-77	17.7	0.0	5.3	0.0	32.5	52.5	52.4	68.6	70.3	84.0	77.8	2.2	463.0
1977-78	0.0	0.0	21.0	13.7	21.7	107.6	67.1	76.0	434.1	52.6	21.3	8.5	823.6
1978-79	0.0	7.1	19.3	13.7	25.7	273.8	207.2	263.5	128.2	282.2	49.0	4.0	1269.7
1979-80													
1980-81	0.0	0.0	0.0	40.6	0.0	90.1	47.0	108.5	112.3	93.3	49.9	14.6	556.3
1981-82	0.0	44.6	0.0	6.0	35.2	249.4	29.9	188.2	204.2	40.7	38.3	12.2	848.7
MEAN													792.3

Long time mean: 927.3 mm (23 yrs)

STATION: MTWARA METEOROLOGICAL STATION

REG.NO: 100.4004

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1976-77	44.7	0.6	7.0	0.2	19.1	91.5	271.2	86.9	100.6	83.7	98.0	5.8	809.3
1977-78	0.0	0.0	27.4	107.2	26.5	125.8	170.3	33.8	755.8	47.0	15.1	2.7	1311.6
1978-79	1.0	1.7	7.7	23.5	58.5	288.6	307.6	357.3	132.0	194.4	53.1	1.4	1426.8
1979-80	14.4	12.8	18.2	2.4	11.3	115.7	350.0	48.6	354.3	189.2	24.6	0.0	1141.5
1980-81	1.4	2.6	9.6	89.1	9.3	98.1	140.7	123.4	122.9	63.3	66.8	15.8	743.0
1981-82	0.0	1.0	4.9	30.2	60.0	316.9	60.2	66.3	256.0	151.9	71.4	14.8	1033.6
1982-83	9.8	15.3	29.8	73.3	120.6	173.0	239.6	203.2	128.8	183.6	182.0	30.8	1389.8
MEAN	10.2	4.9	14.9	46.6	43.6	172.8	219.9	131.4	264.3	130.4	73.0	10.2	1122.2

Long time mean: 1143.9 mm (32 yrs)

STATION: TUNDURU

REG.NO: 101.3700

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1976-77	0.0	0.0	2.8	20.0	0.0	91.5	366.3	128.2	161.6	118.1	54.0	0.0	942.5
1977-78	0.0	0.0	0.0	4.5	33.8	197.9	341.9	95.9	327.0	100.5	0.0	0.0	1101.5
1978-79	0.0	0.0	0.0	0.0	47.0	330.4	188.5	229.4	137.7	78.0	0.0	0.0	1011.0
1979-80	4.4	0.0	0.0	0.0	62.3	228.2	281.3	2.6	245.5	215.6	13.1	0.0	1053.0
1980-81	0.0	3.5	0.0	4.3	25.6	177.0	148.3	165.3	119.1	105.9	131.0	0.0	880.0
1981-82	0.0	0.0	0.0	12.8	135.3	223.5	126.5	164.9	162.1	60.9	66.9	0.0	952.9
MEAN	0.7	0.6	0.5	6.9	50.7	208.1	242.1	131.1	192.2	113.2	44.2	0.0	990.2

Long time mean: 1029.3 mm (53 yrs)

RIVER FLOW DATA

Monthly mean, maximum and minimum flows 1977 - 1983

River	Station	
Matandu	1.L.3	Mtanga
Zinga	1.L.5	Miguruwe
Mbwemkuru	1.M.4	Mnyagala
Mbwemkuru	1.M.6	Singira
Mavuji	1.M.8	Mbiliwia
Nyangao	1.N.2A	Nyangao
Lukuledi	1.N.3	Nanganga
Lukuledi	1.N.4	Nanganga
Lumesule	1.Q.6	Mtua
Miesi	1.Q.9	Rwanda
Mbangala	1.Q.12	Mahinya
Ruvuma	1.Q.14	Rukwamba

DISCHARGE, M^3/S

RIVER: MATANDU
STATION: MTANGA 1.L.3
CATCHMENT AREA: 11,260 KM^2

Year/Flow m^3/s	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1977												
Q_m	1.40	2.70	3.00	13.00	1.80	0.20	-	0.00	0.00	0.00	-	NDA
Q_{max}	8.00	63.00	61.00	167.00	8.70	0.30	0.10	0.00	0.00	0.00	0.50	78.00
Q_{min}	0.30	0.38	0.53	2.00	0.38	0.14	0.00	0.00	0.00	0.00	-	0.18
1978												
Q_m	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	0.00	0.10	NDA
Q_{max}	+	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	0.00	66.00	440.00
Q_{min}	2.00	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	0.00	0.00	0.43
1979												
Q_m	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Q_{max}	140.00	415.00	+	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	2.00
Q_{min}	0.71	0.15	1.45	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	0.00
1980												
Q_m	29.00	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	-	0.25
Q_{max}	300.00	+	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	1.50	1.40
Q_{min}												
1981												
Q_m	NDA	1.50	1.60	2.50	0.96	0.30	0.00	0.00	0.00	0.00	0.00	1.20
Q_{max}	12.00	12.00	9.50	34.00	3.80	0.46	0.00	0.00	0.00	0.00	0.00	37.00
Q_{min}	0.67	0.53	0.40	0.65	0.50	0.12	0.00	0.00	0.00	0.00	0.00	0.00
1982												
Q_m	-	0.60	7.50	+	+	0.30	0.00	0.00	0.00	0.00	NDA	NDA
Q_{max}	0.46	38.00	40.00	+	+	0.65	0.00	0.00	0.00	0.00	+	NDA
Q_{min}	0.00	0.15	1.70	3.60	0.83	0.24	0.00	0.00	0.00	0.00	0.00	NDA
1983												
Q_m	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Q_{max}												
Q_{min}												

NDA = no data available

DISCHARGE, M^3/S

RIVER: ZINGA
STATION: MIGURUWE 1.L.5
CATCHMENT AREA: 830 KM^2

Year/Flow m^3/s	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1977												
Q_m	0.00	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
Q_{max}	0.00	0.85	7.90	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.50
Q_{min}	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1978												
Q_m	0.48	-	0.55	-	0.00	0.00	0.00	0.00	0.00	0.00	NDA	1.08
Q_{max}	27.00	0.10	13.80	8.40	0.00	0.00	0.00	0.00	0.00	0.00	NDA	26.50
Q_{min}	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1979												
Q_m	2.05	1.80	2.20	2.15	0.40	-	0.00	0.00	0.00	0.00	0.00	-
Q_{max}	28.00	17.60	17.30	11.30	2.60	0.10	0.00	0.00	0.00	0.00	0.00	0.50
Q_{min}	0.00	0.40	0.25	0.30	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1980												
Q_m	2.46	1.68	NDA	NDA	NDA	NDA	NDA	0.00	0.00	0.00	-	-
Q_{max}	19.00	15.50	1.92	1.84	NDA	NDA	NDA	0.00	0.00	0.00	0.27	7.10
Q_{min}	0.17	-	0.06	0.05	NDA	NDA	NDA	0.00	0.00	0.00	0.00	0.00
1981												
Q_m	-	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56
Q_{max}	0.80	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
Q_{min}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1982												
Q_m	-	-	1.95	0.27	0.00	0.00	0.00	0.00	0.00	0.00	-	-
Q_{max}	0.73	7.70	17.70	9.10	0.00	0.00	0.00	0.00	0.00	0.00	1.32	2.25
Q_{min}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1983												
Q_m	-	0.00	-	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Q_{max}	3.60	0.00	1.20	3.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Q_{min}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DISCHARGE, M^3/S

RIVER: MBWEMKURU
STATION: MNYANGALA 1.M.4
CATCHMENT AREA: 15,220 KM^2

Year/Flow m^3/s	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1977												
Q_m												
Q_{max}				4.00	34.00							
Q_{min}												
1978												
Q_m												42.00
Q_{max}	170.00	85.00	520.00	300.00								160.00
Q_{min}	9.80	4.80	20.00	4.80								
1979												
Q_m												
Q_{max}												
Q_{min}												
1980												
Q_m												
Q_{max}												
Q_{min}												
1981												
Q_m												
Q_{max}												
Q_{min}												
1982												
Q_m												
Q_{max}												
Q_{min}												
1983												
Q_m												
Q_{max}												
Q_{min}												

DISCHARGE, M^3/S

RIVER: MBWEMKURU
STATION: MITONONO 1.M.5
CATCHMENT AREA: 11,700 KM^2

Year/Flow m^3/s	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1977												
Q_m	-	4.10	1.30	22.50	2.60	0.65	-	-	-	-	0.00	-
Q_{max}	4.80	35.50	6.90	79.00	6.50	1.60	-	-	-	-	0.00	1.60
Q_{min}	-	-	-	6.70	-	-	-	-	-	-	0.00	0.00
1978												
Q_m	NDA	8.00	21.50	26.50	2.90	0.60	-	-	-	-	-	3.50
Q_{max}	109.00	91.00	350.00	75.00	6.90	1.30	-	-	-	-	-	52.00
Q_{min}	-	1.30	1.00	8.30	1.40	-	-	-	-	-	-	-
1979												
Q_m	27.00	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	-	-	-
Q_{max}	68.00	430.00	44.00	NDA	NDA	NDA	NDA	NDA	-	-	-	1.90
Q_{min}	5.00	62.00	22.00	NDA	NDA	NDA	NDA	NDA	-	-	-	-
1980												
Q_m	20.00	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	-	-
Q_{max}	200.00	350.00	117.00	134.00	NDA	NDA	NDA	NDA	NDA	NDA	-	-
Q_{min}	0.70	70.00	71.00	67.00	NDA	NDA	NDA	NDA	NDA	NDA	-	-
1981												
Q_m	-	2.60	2.50	1.60	1.70	-	-	-	-	-	0.00	0.70
Q_{max}	5.20	9.00	11.00	12.50	40.00	-	1.40	-	-	-	0.00	24.50
Q_{min}	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00
1982												
Q_m	-	0.55	11.70	9.20	3.10	-	-	-	0.00	0.00	0.00	1.50
Q_{max}	5.20	3.40	60.00	63.00	13.00	1.40	-	-	0.00	0.00	0.00	75.00
Q_{min}	-	-	-	-	1.40	-	-	0.00	0.00	0.00	0.00	3.10
1983												
Q_m	10.10	4.70	46.00	NDA	6.70	1.90	-	-	-	-	0.00	-
Q_{max}	39.00	48.00	185.00	NDA	24.00	3.70	1.00	-	-	-	0.00	1.10
Q_{min}	2.50	0.80	8.30	NDA	2.40	1.10	-	-	-	0.00	0.00	0.00

DISCHARGE, M^3/S

RIVER: MBWEMKURU
STATION: SINGIRA 1.M.6
CATCHMENT AREA: 3,010 KM^2

Year/Flow m^3/s	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1977												
Q_m	-	1.90	0.55	15.00	NDA	0.39	-	-	0.00	0.00	0.00	0.52
Q_{max}	5.10	33.00	6.80	110.00	7.70	3.40	-	-	0.00	0.00	0.00	53.00
Q_{min}	0.00	-	-	2.80	5.30	-	-	0.00	0.00	0.00	0.00	0.00
1978												
Q_m	2.25	0.95	NDA	NDA	NDA	NDA	0.00	0.00	0.00	0.00	0.00	NDA
Q_{max}	78.00	3.30	96.00	262.00	7.60	NDA	0.00	0.00	0.00	0.00	0.00	14.00
Q_{min}	-	0.25	0.20	1.25	0.95	NDA	0.00	0.00	0.00	0.00	0.00	0.00
1979												
Q_m	NDA	75.00	61.00	NDA	14.40	4.10	NDA	0.35	-	NDA	-	-
Q_{max}	94.00	192.00	310.00	315.00	38.00	13.20	1.25	1.25	-	-	-	2.60
Q_{min}	0.39	20.00	21.00	37.00	10.20	1.90	0.60	-	-	-	-	-
1980												
Q_m	18.60	7.20	25.00	41.50	6.10	0.55	0.37	-	-	-	-	-
Q_{max}	268.00	114.00	71.00	147.00	17.80	1.35	0.75	-	-	-	-	-
Q_{min}	0.52	0.80	2.20	12.60	1.50	0.35	-	-	-	-	0.00	-
1981												
Q_m	-	2.10	2.10	0.65	0.95	-	NDA	-	0.00	0.00	0.00	-
Q_{max}	10.80	19.40	26.70	15.00	56.00	-	-	-	0.00	0.00	0.00	8.00
Q_{min}	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-
1982												
Q_m	-	0.30	NDA	6.80	NDA	-	-	-	0.00	0.00	-	1.10
Q_{max}	0.33	6.80	90.00	39.50	16.60	0.25	-	-	0.00	0.00	0.25	31.50
Q_{min}	-	-	-	0.80	0.25	-	-	0.00	0.00	0.00	0.00	-
1983												
Q_m	9.20	4.50	22.00	20.50	3.60	0.75	0.32	-	-	-	0.00	-
Q_{max}	20.00	75.00	162.00	163.00	11.80	2.10	0.65	-	-	-	0.00	19.00
Q_{min}	-	-	6.60	6.60	1.80	0.40	-	-	-	0.00	0.00	0.00

DISCHARGE, M^3/S

RIVER: MAVUJI
STATION: MBILIWIA 1.M.8
CATCHMENT AREA: 2,930 KM^2

Year/Flow m^3/s	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1977												
Q_m	0.52	+	+	+	0.35	0.33	0.32	0.32	0.31	0.31	0.37	+
Q_{max}	+	+	+	+	0.37	0.33	0.33	0.33	0.31	0.31	+	+
Q_{min}	0.30	0.30	0.35	0.37	0.33	0.32	0.32	0.31	0.31	0.30	0.30	0.32
1978												
Q_m	+	0.43	+	+	0.31	0.32	0.31	0.31	0.31	0.31	0.37	+
Q_{max}	+	+	+	+	0.34	0.32	0.31	0.31	0.31	0.31	+	+
Q_{min}	0.30	0.29	0.28	0.30	0.30	0.30	0.30	0.31	0.31	0.30	0.30	0.34
1979												
Q_m	NDA	+	+	+	0.44	0.38	0.33	0.33	0.33	0.33	0.33	NDA
Q_{max}	NDA	+	+	+	+	0.40	0.35	0.33	0.33	0.33	0.33	0.42
Q_{min}	NDA	+	0.38	0.33	0.33	0.32	0.33	0.33	0.33	0.33	0.33	0.33
1980												
Q_m	NDA	+	+	+	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Q_{max}	+	+	+	+	+	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Q_{min}	0.37	+	0.49	0.33	0.33	NDA	NDA	NDA	NDA	NDA	NDA	NDA
1981												
Q_m	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	0.25	0.24	0.24	+
Q_{max}	NDA	+	NDA	NDA	NDA	NDA	NDA	0.26	0.26	0.24	0.24	+
Q_{min}	NDA	+	NDA	NDA	NDA	NDA	NDA	0.26	0.25	0.23	0.24	0.24
1982												
Q_m	+	0.32	0.50	+	0.42	0.32	0.27	0.30	0.30	0.30	0.30	+
Q_{max}	+	0.47	+	+	+	0.37	0.29	0.30	0.30	0.30	0.30	+
Q_{min}	0.31	0.27	0.28	0.33	0.37	0.29	0.26	0.30	0.30	0.30	0.30	0.30
1983												
Q_m	0.45	0.32	0.42	0.48	0.41	0.33	0.33	0.33	0.33	0.34	0.33	0.47
Q_{max}		0.37			0.53	0.34	0.33	0.33	0.33	0.52	0.33	+
Q_{min}	0.31	0.31	0.32	0.35	0.34	0.33	0.32	0.32	0.33	0.33	0.33	0.33

+ = flow > 0.6 m^3/s

DISCHARGE, M^3/S

RIVER: NYANGAO
STATION: NYANGAO 1.N.2A
CATCHMENT AREA: 200 KM^2

Year/Flow m^3/s	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1977												
Q_m	0.54	0.81	1.32	1.17	0.62	0.56	0.62	0.56	0.50	0.50	0.51	0.44
Q_{max}	0.67	1.42	1.56	1.52	0.97	0.75	0.72	0.70	0.58	0.54	0.60	0.54
Q_{min}	0.40	0.50	1.20	0.65	0.44	0.40	0.50	0.44	0.26	0.36	0.38	0.30
1978												
Q_m	0.48	0.46	0.50	0.50	0.40	0.40	0.46	0.40	0.34	0.34	0.42	NDA
Q_{max}	0.75	0.58	0.67	0.58	0.56	0.51	0.54	0.54	0.51	0.50	0.62	0.52
Q_{min}	0.28	0.25	0.34	0.38	0.23	0.25	0.34	0.23	0.25	0.23	0.26	0.46
1979												
Q_m	NDA	0.81	0.56	0.72	0.58	0.50	0.30	0.46	0.44	0.32	0.40	0.50
Q_{max}	0.95	1.32	1.22	1.25	0.79	0.62	0.51	0.70	0.64	0.44	0.58	0.81
Q_{min}	0.56	0.58	0.40	0.46	0.50	0.36	0.21	0.21	0.23	0.21	0.25	0.23
1980												
Q_m	1.39	0.88	0.98	1.19	0.82	0.94	NDA	NDA	NDA	NDA	0.82	0.88
Q_{max}	2.25	1.59	1.39	1.90	1.08	1.24	NDA	NDA	NDA	1.02	1.02	1.70
Q_{min}	0.46	0.49	0.52	0.49	0.46	0.52	NDA	NDA	NDA	0.64	0.52	0.55
1981												
Q_m	0.77	1.12	1.19	0.72	0.67	0.55	0.58	0.58	0.55	0.52	0.61	0.67
Q_{max}	1.43	1.43	1.70	0.88	2.25	0.64	0.64	0.67	0.64	0.61	1.35	1.59
Q_{min}	0.55	0.72	0.64	0.58	0.43	0.43	0.46	0.52	0.40	0.43	0.37	0.43
1982												
Q_m	0.48	0.44	0.52	0.40	0.36	0.34	0.30	0.23	0.23	0.22	0.26	0.38
Q_{max}	0.95	0.69	0.98	1.15	0.48	0.42	0.40	0.26	0.25	0.25	0.46	1.05
Q_{min}	0.30	0.36	0.38	0.27	0.29	0.27	0.25	0.16	0.20	0.18	0.21	0.24
1983												
Q_m	0.49	0.33	0.57	0.49	0.49	0.37	0.37	0.39	0.43	0.39	0.33	0.45
Q_{max}	1.80	0.57	2.15	0.87	2.05	0.47	0.43	0.45	0.45	0.43	0.43	0.87
Q_{min}	0.27	0.23	0.29	0.33	0.35	0.29	0.31	0.39	0.33	0.33	0.24	0.26

DISCHARGE, M^3/S

RIVER: LUKULEDI
STATION: NANGANGA 1.N.3
CATCHMENT AREA: 2,710 KM^2

Year/Flow m^3/s	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1977												
Q_m												
Q_{max}												
Q_{min}												
1978												
Q_m	0.000	0.073	0.335	2.932	0.609	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Q_{max}	0.124	0.163	4.389	15.496	0.279	0.000	0.000	0.000	0.000	0.000	0.100	0.000
Q_{min}	0.000	0.000	0.107	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1979												
Q_m	39.662	41.981	23.979	26.169	4.495	1.096	0.800	0.217	0.206	0.197	0.137	0.288
Q_{max}	65.000	89.879	85.132	92.861	13.896	2.265	1.096	0.579	0.518	0.114	0.746	2.265
Q_{min}	0.221	6.496	1.546	6.497	1.394	1.179	0.546	0.182	0.125	0.000	0.000	0.105
1980												
Q_m												
Q_{max}												
Q_{min}												
1981												
Q_m												
Q_{max}												
Q_{min}												
1982												
Q_m												
Q_{max}												
Q_{min}												
1983												
Q_m	1.434	1.322	4.711	5.754	2.275	0.214	0.000	0.000	0.000	0.000	0.000	0.000
Q_{max}	7.245	3.211	8.789	12.027	4.292	1.344	0.186	0.000	0.000	0.000	0.000	0.085
Q_{min}	0.402	0.165	1.065	1.689	1.058	0.186	0.000	0.000	0.000	0.000	0.000	0.000

DISCHARGE, M^3/S

RIVER: LUKULEDI
STATION: MTUA 1.N.4
CATCHMENT AREA: 4,170 KM^2

Year/Flow m^3/s	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1977												
Q_m	1.05	NDA	NDA	NDA	NDA	0.85	0.75	NDA	0.65	0.65	0.70	0.80
Q_{max}	1.45	2.10	5.50	14.00	1.90	1.10	0.75	NDA	0.65	0.65	0.75	0.85
Q_{min}	0.70	0.75	0.75	0.65	0.75	0.75	0.70	NDA	0.60	0.60	0.65	0.75
1978												
Q_m	NDA	NDA	NDA	NDA	NDA	0.75	0.70	0.75	0.75	0.90	1.15	2.35
Q_{max}	0.85	NDA	NDA	NDA	1.25	0.80	0.90	0.90	0.85	0.85	2.10	6.00
Q_{min}	0.80	NDA	NDA	NDA	0.55	0.70	0.70	0.70	0.70	0.70	0.70	1.15
1979												
Q_m	9.70	31.00	15.80	18.00	5.80	3.20	NDA	NDA	0.75	0.70	NDA	NDA
Q_{max}	35.00	65.00	45.00	50.00	12.00	3.65	2.70	1.25	1.00	0.75	0.85	1.30
Q_{min}	1.95	7.10	6.00	7.10	2.55	2.20	2.65	0.85	0.70	0.60	0.60	0.70
1980												
Q_m	5.90	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Q_{max}	17.20	55.00	9.50	NDA	3.45	NDA	NDA	NDA	NDA	NDA	NDA	1.95
Q_{min}	1.50	7.20	7.10	NDA	0.85	NDA	NDA	NDA	NDA	NDA	NDA	0.75
1981												
Q_m	NDA	NDA	NDA	1.05	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Q_{max}	1.90	3.95	6.00	2.30	3.45	NDA	NDA	NDA	NDA	0.70	NDA	NDA
Q_{min}	0.85	1.05	1.05	0.90	0.85	NDA	NDA	NDA	NDA	0.65	NDA	NDA
1982												
Q_m												
Q_{max}												
Q_{min}												
1983												
Q_m												
Q_{max}												
Q_{min}												

DISCHARGE, M^3/S

RIVER: RUVUMA
STATION: LUKWAMBA 1.Q.14
CATCHMENT AREA: 83,000 KM^2

Year/Flow m^3/s	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1977												
Q_m												
Q_{max}												
Q_{min}												
1978												
Q_m									81.306			
Q_{max}									91.964			
Q_{min}									70.234			
1979												
Q_m												
Q_{max}												
Q_{min}												
1980												
Q_m												
Q_{max}												
Q_{min}												
1981												
Q_m												
Q_{max}												
Q_{min}												
1982												
Q_m												
Q_{max}												
Q_{min}												
1983												
Q_m										49.111		
Q_{max}										54.692		
Q_{min}										40.015		

RIVER FLOWS

RIVER: LUMESULE RIVER
STATION: RUANDA 1.Q.6A
CATCHMENT AREA: 1,430 KM^2

Year/Flow m^3/s	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1977												
Q_m												
Q_{max}												
Q_{min}												
1978												
Q_m												
Q_{max}												
Q_{min}												
1979												
Q_m												
Q_{max}												
Q_{min}												
1980												
Q_m	12.40											
Q_{max}	13.27											
Q_{min}	11.76											
1981												
Q_m		1.49	0.73	0.19								
Q_{max}		1.87	1.09	0.29								
Q_{min}		1.09	0.36	0.13								
1982												
Q_m	0.16	0.10	0.97	2.46	0.42	0.00	0.00	0.00	0.00			
Q_{max}	0.27	2.81	2.41	7.46	1.49	0.23	0.00	0.00	0.00			
Q_{min}	0.05	0.09	0.86	1.00	0.02	0.00	0.00	0.00	0.00			
1983												
Q_m												
Q_{max}												
Q_{min}												

DISCHARGE, M^3/S

RIVER: MIESI
STATION: MIKELE 1.Q.9
CATCHMENT AREA: 800 KM^2

Year/Flow m^3/s	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1977												
Q_m	0.051	0.291	2.140	5.198	0.898	0.150	0.101	0.054	0.046	0.038	0.025	0.035
Q_{max}	1.830	3.850	7.400	27.40	1.430	0.300	0.101	0.101	0.052	0.039	0.025	0.101
Q_{min}	0.039	0.052	0.171	0.82	0.301	0.101	0.101	0.052	0.039	0.025	0.025	0.025
1978												
Q_m	0.078	0.898	0.419	2.798	0.113	0.091	0.091	0.000	0.000	0.000	0.000	0.192
Q_{max}	2.080	25.80	17.70	15.20	0.415	0.091	0.091	0.091	0.000	0.000	0.000	4.538
Q_{min}	0.047	0.06	0.13	1.96	0.000	0.091	0.090	0.090	0.000	0.000	0.000	0.000
1979												
Q_m			NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	0.000	0.000
Q_{max}			NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	0.000	0.000
Q_{min}			NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	0.000	0.000
1980												
Q_m												
Q_{max}												
Q_{min}												
1981												
Q_m	0.281	0.069	0.085	0.042	0.028	0.035	0.035	0.035	0.000	0.000	0.000	0.000
Q_{max}	0.776	0.443	0.101	0.058	0.035	0.035	0.035	0.035	0.035	0.000	0.000	0.790
Q_{min}	0.249	0.01	0.01	0.000	0.021	0.027	0.035	0.035	0.000	0.000	0.000	0.000
1982												
Q_m	0.162	0.162	0.578	4.517								
Q_{max}	0.324	0.324	2.108	7.812								
Q_{min}	0.082	0.082	0.105	3.490								
1983												
Q_m												
Q_{max}												
Q_{min}												

DISCHARGE, M^3/S

RIVER: MBANGARA
STATION: MAHINYO 1.Q.12
CATCHMENT AREA: 3,230 KM^2

Year/Flow m^3/s	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1977												
Q_m												
Q_{max}												
Q_{min}												
1978												
Q_m		34.230	2.109	8.500								
Q_{max}		267.720	3.391	9.609								
Q_{min}		0.190	1.231	3.227								
1979												
Q_m	12.604	29.571	9.529	7.141	2.344	0.370	0.000	0.000	0.000	0.000	0.000	0.000
Q_{max}	37.669	299.596	19.506	32.990	12.604	0.930	0.000	0.000	0.000	0.000	0.000	0.387
Q_{min}	1.950	11.206	0.660	3.855	0.863	0.319	0.000	0.000	0.000	0.000	0.000	0.000
1980												
Q_m												
Q_{max}												
Q_{min}												
1981												
Q_m												
Q_{max}												
Q_{min}												
1982												
Q_m												
Q_{max}												
Q_{min}												
1983												
Q_m												
Q_{max}												
Q_{min}												

GROUNDWATER QUALITY DATA

WATER QUALITY OF SEPARATE WELL TYPES

Data of the WMP is included as well as data collected since 1978

I = Plateau II = Coast III = Karroo IV = Basement TO = Total

		BOREHOLES					DUG WELLS					HANDAUGER WELLS				
		I	II	III	IV	TO	I	II	III	IV	TO	I	II	III	IV	TO
pH	- 6.5	14	5	-	2	21	2	5	1	8	16	4	2	-	-	6
	6.6 - 7.0	5	3	-	7	15	10	1	-	11	22	3	17	-	-	20
	7.1 - 7.5	8	5	-	13	26	2	12	-	9	23	8	14	-	-	22
	7.6 - 8.0	3	3	-	14	20	4	10	-	1	15	9	2	-	1	12
	8.1 -	4	1	-	7	12	1	3	-	4	8	6	1	-		7
	Total	34	17	0	43	94	19	31	1	33	84	30	36	0	1	67
EC_{25} S/cm	- 300	8	-	-	-	8	9	7	1	12	29	7	3	-	-	10
	301 - 700	8	4	-	1	13	4	11	-	12	27	4	-	-	1	5
	701 - 2000	16	11	-	23	40	8	28	-	6	42	4	22	-	-	26
	2001 - 5000	2	3	-	17	22	4	9	-	3	16	25	12	-	-	37
	5001 -	1	-	-	9	10	-	2	-	-	2	1	12	-	-	13
	Total	35	18	0	50	103	25	57	1	33	116	41	49	0	1	91
Hard-ness mEq/l	- 2.0	3	3	-	-	6	8	4	1	6	19	-	-	-	-	-
	2.1 - 5.0	9	4	-	7	20	-	5	-	10	15	-	-	-	2	2
	5.1 - 10.0	6	8	-	7	21	2	3	-	2	7	-	6	-	-	6
	10.1 - 15.0	5	1	-	6	12	2	3	-	1	6	-	6	-	-	6
	15.1 -	4	1	-	18	23	-	5	-	3	8	-	9	-	-	9
	Total	27	17	0	38	82	12	20	1	22	55	0	21	0	2	23
Cl mg/l	- 100	9	2	-	7	18	11	3	1	10	25	-	1	-	-	1
	101 - 200	9	5	-	2	16	4	2	-	3	9	-	3	-	-	3
	201 - 400	4	5	-	9	18	2	3	-	7	12	-	8	-	-	8
	401 - 800	4	5	-	9	18	3	3	-	3	9	-	13	-	-	13
	801 -	4	-	-	9	13	-	1	-	2	3	-	5	-	-	5
	Total	30	17	0	36	83	20	12	1	25	58	0	30	0	0	30
F mg/l	- 0.20	5	2	-	3	10	9	4	-	3	16	16	10	-	-	26
	0.21 - 0.50	15	3	-	6	24	3	1	-	7	11	3	-	-	-	3
	0.51 - 0.80	5	4	-	10	19	2	2	1	7	12	1	-	-	-	1
	0.81 - 1.20	-	3	-	12	15	2	4	-	5	11	-	-	-	-	-
	1.21 -	1	-	-	7	8	1	-	-	1	2	-	-	-	-	-
	Total	26	12	0	38	76	17	11	1	23	52	20	10	0	0	30

		BOREHOLES					DUG WELLS					HANDAUGER WELLS				
		I	II	III	IV	TO	I	II	III	IV	TO	I	II	III	IV	TO
So_4 mg/l	- 50	20	6	-	24	50	8	5	1	16	30	7	1	-	-	8
	51 - 100	4	1	-	3	8	2	8	-	-	10	5	-	-	-	5
	101 - 150	2	2	-	1	5	3	3	-	4	10	3	-	-	-	3
	151 - 200	1	3	-	-	4	-	3	-	1	4	10	5	-	-	15
	201 -	-	1	-	4	5	-	10	-	1	11	2	5	-	-	7
	Total	27	13	0	32	72	13	29	1	22	65	27	11	0	0	38
NH_4 mg/l	- 0.20	7	4	-	3	14	1	8	1	6	16	11	5	-	-	16
	0.21 - 0.50	8	4	-	7	19	5	20	-	11	36	8	9	-	-	17
	0.51 - 0.80	6	3	-	6	15	5	4	-	2	11	1	2	-	-	3
	0.81 - 1.20	-	1	-	5	6	3	2	-	8	13	-	2	-	-	2
	1.21 -	4	1	-	7	12	3	4	-	4	11	-	2	-	-	2
	Total	25	13	0	28	68	17	38	1	31	87	20	18	0	0	38
Iron mg/l	- 0.10	8	3	-	12	23	3	16	-	4	23	5	4	-	-	9
	0.11 - 0.20	2	5	-	8	15	5	11	-	3	19	4	4	-	-	8
	0.21 - 0.50	6	4	-	14	24	7	10	-	3	20	15	2	-	-	17
	0.51 - 1.00	5	2	-	5	12	5	8	-	2	15	-	1	-	-	1
	1.01 -	9	3	-	5	17	3	3	-	8	14	-	-	-	1	1
	Total	30	17	0	44	91	23	48	0	20	91	24	11	0	1	36
Mn mg/l	- 0.05	2	5	-	8	15	5	10	-	3	18	-	5	-	-	5
	0.06 - 0.10	2	-	-	1	3	-	3	-	-	3	-	1	-	-	1
	0.11 - 0.50	9	2	-	14	25	4	15	-	5	24	-	3	-	-	3
	0.51 - 1.00	5	2	-	2	9	4	5	-	1	10	5	2	-	-	7
	1.01 -	3	6	-	10	19	10	4	-	9	23	16	-	-	-	16
	Total	21	15	0	35	71	23	37	0	18	78	21	11	0	0	32
Coli-bact. per 100 ml	NIL	7	2	-	3	12	3	10	-	3	16	13	12	-	-	25
	0.1 - 1.0	-	1	-	-	1	4	2	-	-	6	26	3	-	-	29
	1.1 - 5.0	1	1	-	2	4	1	4	-	1	6	-	2	-	-	2
	5.1 - 10.0	2	2	-	-	4	2	5	-	-	7	-	2	-	-	2
	10.1 -	-	-	-	-	-	4	21	-	16	41	2	1	-	-	3
	Total	10	6	-	5	21	14	42	0	20	76	41	20	0	0	61
NO_3 mg/l	- 0.1	4	2	-	1	7	2	-	-	3	5	-	-	-	-	-
	0.11 - 0.5	3	-	-	-	3	5	7	-	-	12	15	6	-	-	21
	0.51 - 1.0	-	-	-	-	-	2	1	-	-	3	5	3	-	-	8
	1.1 - 5.0	-	3	-	-	3	-	15	-	-	15	1	8	-	-	9
	5.1 -	-	-	-	-	-	-	11	-	-	11	-	2	-	-	2
	Total	7	5	0	1	13	9	34	0	3	46	21	19	0	0	40

BOREHOLE DATA

Abbreviations:

TH = TEST HOLE G.W.L. = GROUNDWATER LEVEL

BOREHOLES DRILLED BY CYCLON OR SCHRAMM SINCE 1978

	Location	BH no.	Depth m	STW m	Q m^3/h	pH	Fe mg/l	E.C. 25 S/cm	Hardness ^0dH	Chloride mg/l	Sulphate mg/l	Fluoride mg/l	Geological formation	Remarks
1	Naliendele Mbawala Chini	Mt 65/81	96	53.7	36			500					Plateau	Production
2	Mbawala Chini	Mt 212/81	89	51.3	42								Plateau	Production
3	Mtwara Mtawanya	Mt 42/80	54		24								Coast	Production
4	Mtwara Mtawanya	Mt 51/81	52	6.1	168		2.7	1 470	20				Coast	Production
5	Mtwara Mtawanya	Mt 63/81	52	6.9	168	6.7	0.2	2 000	17.36	260	150	0.9	Coast	Production
6	Mnazimoja	LD 34/80	65		33	7.5	0.3	900	22.4	135	12		Plateau	Production
7	Mnazimoja	LD 35/80	65	Artesian	33	7.7	0.7	950	29.6	170	14	0.3	Plateau	Production
8	Mnazimoja	LD 23/83	60	Artesian	31.8								Plateau	Production
9	Kilwa Masoko	LD 108/80	52	6.5	12	6.5	1.0	2 300	22.4	675	100		Coast	Handpump
10	Kilwa Masoko	LD 110/80	30		15								Coast	Handpump
11	Kilwa Masoko	LD 111/80	39	7.1	24	6.4	0.4	350	2.8	75	23		Coast	Production
12	Kilwa Masoko	LD 123/80	42	7.7	24	5.4	0.45	525	3.92	150	17		Coast	Production
13	Kilwa Masoko	LD 124/80	42	1.4	42	6.5	0.08	320	2.8	40	39		Coast	Production
14	Kilwa Mpara	LD 69/83	50		18								Coast	Production
15	Kilwa Mpara	LD 70/83	20		9								Coast	Production
16	Kilwa Mpara	LD 78/83	31	2.7	16.5								Coast	Production
17	Rwelu	Mt 36/81	36	11.3	6	7.5		275	8.4	25	5		Plateau	Handpump
18	Mtiniko	Mt 88/83	120	56	7.2								Plateau	TH

	Location	BH no.	Depth m	STW m	Q m^3/h	pH	Fe mg/l	E.C. 25 S/cm	Hardness 0_{dH}	Chloride mg/l	Sulphate mg/l	Fluoride mg/l	Geological formation	Remarks
19	Mbambakofi	Mt 43/80	127		very low								Plateau	TH
20	Mbambakofi	Mt 73/80	94	56.7	very low								Plateau	TH
21	Nanyamba	Mt 601	114	59.2	41	5.8	1.8	675	5.6	140	55	0.2	Plateau	Production
22	Nanyamba	Mt 603	120	61.9	41	5.0	0.6	1 560	100	430	25	0.25	Plateau	Production
23	Arusha Chini	Mt 87/83	52	2.8	3								Plateau	Handpump
24	Nyangedi	LD 10/83	22		14.4								Plateau	Production
25	Nyangedi	LD 9/83	40		16.2								Plateau	Production
26	Kitangari	Ne 601	124	0.6	83	5.3	1.5	140			3	0.25	Plateau	Collapsed
27	Kitangari	Ne 602	126	0.7	83	6.2	0.65	195				0.25	Plateau	Collapsed
28	Kitangari	Mt 10/81	120	1.4	102	5.6	0.1	250	0.25	70	0	0.25	Plateau	Production
29	Kitangari	Mt 11/81	124	1.6	90	5.5	0.1	250		70	0		Plateau	Production
30	Kitangari	Mt 12/81	126	+0.2	108	5.6	0.1	250		70	0		Plateau	Production
31	Kitangari	Mt 13/81	120	1.3	90	5.6		320		70	3		Plateau	Production
32	Masasi	Ma 601	43.3	15.0	5.8	7.7	0.15	1 200			2	0.8	Basement	Production
33	Masasi	Ma 602	39	15.2	7.5	7.8	0.25	1 720			6	0.8	Basement	G.W.L. Observation
34	Masasi	Ma 603	50	13.7	7.5		0.2	1 650			3	1.2	Basement	Production
35	Masasi	Ma 604	90	11.7		7.4							Basement	G.W.L. Observation
36	Masasi	Ma 605	49	12.0	11.7	7.3	0.4	1 760			5	0.7	Basement	Production

	Location	BH no.	Depth m	STW m	Q m^3/h	pH	Fe mg/l	E.C. 25 S/cm	Hardness 0dH	Chloride mg/l	Sulphate mg/l	Fluoride mg/l	Geological formation	Remarks
37	Masasi Chiwale	Ma 9/81	33		0								Basement	TH
38	Masasi Chiwale	Ma 147/81	44		0								Basement	TH
39	Masasi Chiwanbo	Ma 56/80	70	6.6									Basement	Production
40	Ruangwa	LD 105 A/79	52	4.7	10.4	6.9	3.8	3 500	45	320	1100	1.2	Basement	Production
41	Ruangwa	LD 105 B/79	50.5	8.4	4.6	6.9	0.55	5 500	123	510	2500	6.6	Basement	TH
42	Nachingwea								80.6	1100	280	0.75	Basement	TH
	Naipanga	Na 601	43.3		9.4	7.3	0.7	4 600						
													Basement	TH
43	Nachingwea													
	Naipanga	Na 602	39					3 500						
44	Nachingwea town	Na 603	50		5.8	7.8	0.25	5 000	10.6		22	0.9	Basement	TH
45	Nachingwea town	Na 604	90		4.6			7 800					Basement	TH
46	Nachingwea													
	Naipingo	Na 605	49	6.8	2.9			2 000					Basement	TH
47	Nachingwea												Basement	TH
	Naipingo	Na 606	46					5 500						
													Basement	TH
48	Nachingwea town	Na 607	139		5.4			4 000						
													Basement	TH
49	Nachingwea													
	Naipingo	LD 137/79	92			7.6	2.4	7 000	179.2	2200	55	0.3	Basement	TH
50	Nachingwea													
	Mkumba Pacha	LD 99/80	150	5.5	12	6.3	0.2	9 400	252	325	0		Basement	TH
51	Nachingwea													
	Ruponda	LD 100/80	60		4.5								Basement	Production

	Location	BH no.	Depth m	STW m	Q m^3/h	pH	Fe mg/l	E.C. 25 S/cm	Hardness ^0dH	Chloride mg/l	Sulphate mg/l	Fluoride mg/l	Geological formation	Remarks
52	Nachingwea Mkumba Shamba	LD 136/79	77.5	15	30	6.3	0.55	1 960		310	55		Basement	Production
53	Nacingwea Mkumba Shamba	LD 136 B/79	92	14.5	10	6.6	0.75	1 720	36.96	250	34	0.0	Basement	Production
54	Nachingwea Mkumba Shamba	LD 50/81	90	1.3	10	6.6		2 500	67.2				Basement	Production
55	Nachingwea Mkumba Shamba	LD 52/81	70	12.0	15	7.8	0.2	800	23.2				Basement	Production
56	Kitangari	Mt 25/83	115		114								Plateau	Production
57	Kitangari	Mt 24/83	85	0.0	90								Plateau	Production
58	Nanyamba	Mt 602	114	61.6	20								Plateau	TH
59	Nachingwea Mkumba Shamba	LD 136 A/79	96	17.5	12								Basement	TH
60	Mbawala Chini	Mt 182/81	93										Plateau	TH
61	Mbawala Chini	Mt 193/81	90										Plateau	TH
62	Nachingwea Mnero	LD 109/80	38										Basement	TH
63	Nachingwea Mnero	LD 129/80	60										Basement	TH
64	Kilwa Mpara	LD 77/83	30										Coast	TH
65	Kilwa Mpara	LD 71/83	45										Coast	TH

	Location	BH no.	Depth m	STW m	Q m^3/h	pH	Fe mg/l	E.C. 25 S/cm	Hardness ^0dH	Chloride mg/l	Sulphate mg/l	Fluoride mg/l	Geological formation	Remarks
66	Kilwa Masoko	103/79	43	3.55	10.2	7.8	0.3	550	6.9	102	20	0.12	Coast	
67	Kilwa Masoko	80/79	37	5.9	3.6	7.5	0.48	1 090	9.0	265	130	0.0	Coast	
68	Lindi Pangaboi	81/80	85	53.95	6.8	8.8		1 100	6.4	184	10	-	Coast	
69	Kilwa Ruhatwe	165/78	106	15.15	40.9	7.9		1 250	7.0	252	148	0.3	Plateau	
70	Lindi Mipingo	68/82	95	+0.82				1 550					Plateau	
71	Lindi Namkongo	77/79	100	16.77	11.3	7.0	0.9	4 200	97.1	950		0.76	Plateau	
72	Lindi Mtama	103/80	61	+ 0.3	10.9	7.4	1.0	240	4.0	28			Plateau	
73	Lindi Mtama	5/80	50	0.82	18.2	7.4	0.1	250		51			Plateau	
74	Nachingwea Kitandi	80/77	61	9.14	7.3	7.7	1.9	2 650	48.6	712		1.1	Basement	
75	Nachingwea Mkoka	71/78	57	32.0	9.1	8.1	0.1	810	11.1	47.5		0.2	Basement	
76	Nachingwea Mkumba Shamba	132/78	134	22.6	16.3	8.4	0.3	720	13.1	79		0.3	Basement	
77	Nachingwea Mkumba Shamba	112/78	113	42.46	4.6	8.3	0.2	650	10.1	84		0.4	Basement	
78	Nachingwea Mkumba Pacha	101/77	152.4	10.2	29.2	8.2	0.2	1 540	25.4	304		0.25	Basement	

BASEMENT STUDY

CONTENTS Page

SUMMARY

The Basement area, which covers mainly Masasi and Nachingwea Districts has proved to be rather difficult from the water supply point of view.

Shallow groundwater occurs mainly as perched water. This means that well siting is difficult and risks for unsufficient or seasonal wells are big. Deepening of the dug wells seldom improves the situation. Water quality in dug wells is normally acceptable.

Deep groundwater occurs in the coarse weatherd layers above the solid baserock and especially in fault zones. Water quality, especially salinity causes problems. Most saline water has been found in higher yielding boreholes drilled in deep fault zones in valleys.

To explore further the occurance of deep groundwater, a down-the-hole (DTH) hammer drill was recently purchased. The aim has also been to drill boreholes for handpump wells in the areas, where dug wells are not feasible. The rig has proved to be suitable for the task. Drilling has been carried out on the higher elevations of terrain and the water quality has been better there than in the boreholes drilled in the valleys and fault zones. Yields of the boreholes have been generally small and only about in 38 % of the cases more than 5 l/min. However, by improving the borehole siting DTH-hammer drilling will be a suitable method in providing water in the rural areas in Basement.

To assess the groundwater resourses in Masasi and Nachingwea towns, investigations and testpumpings were carried out in the Mkumba Shamba wellfield in Nachingwea and in the Magumchila wellfield in Masasi. No remarkable changes were found in static water levels as a result of long continued pumping in Mkumba Shamba and Magumchila. It seems to be possible to develop the Mkumba Shamba wellfield further up to 1,500 m^3/d. Together with Mkumba Pacha wellfield (600 m^3/d) and the local handpump wells (150 m^3/d) the total groundwater abstraction in Nachingwea could be raised up to about 2,250 m^3/d, which is more than three times the present production. In Masasi the Magumchila wellfield seems to be fully utilized with the capacity of 1,000 m^3/d and possibilities to find other local groundwater resourses are small. Long term test pumpings are recommended to verify the above estimates.

1. BACKGROUND

The information and experience gained during the preparation of WMP-77 and Mtwara-Lindi Rural Water Supply Project indicate, that from the water supply point of view the Basement is one of the most problematic areas within the Project.

It has been difficult to find reliable water sources for the rural villages and expansion of the water supplies of the fast developing towns of Masasi and Nachingwea are facing problems in finding new economically feasible water sources. Therefore, a more detailed hydrogeological study of the Basement area was decided to be carried out in connection of the Ground Water Review included in the Updating of Water Master Plan.

2. GENERAL HYDROGEOLOGY

In the Basement area, which covers about 40 % of the project area, mainly in Masasi and Nachingwea Districts, the old Pre-Cambrian rocks are exposed and partly outcropped. It is composed of hard crystalline rocks with the main rock types being different gneisses such as granitic and pegmatitic gneiss with fine - and coarse -grained variations, granulites, schists and marble. The basement rock is normally covered by in situ weathering products. Figure 1.

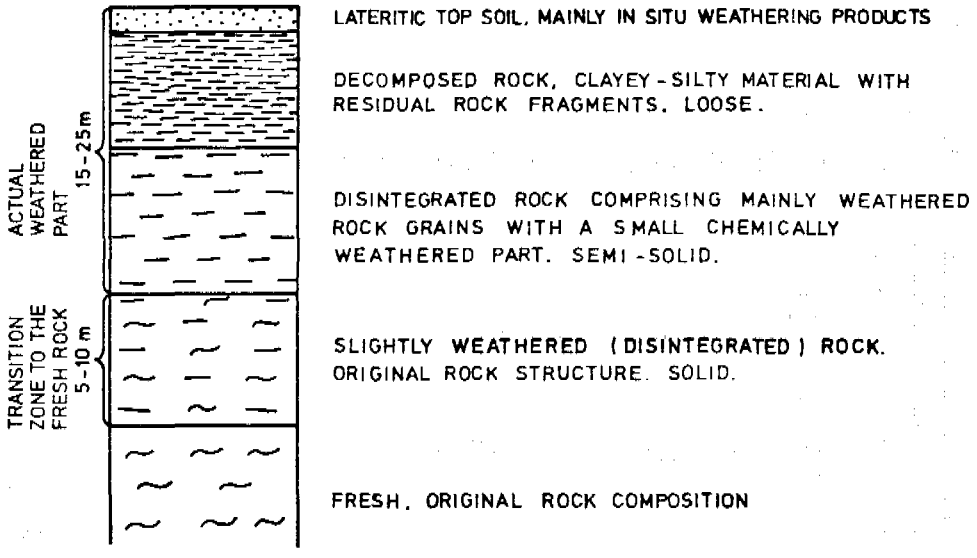


Figure 1 **Generalized Average Weathering Profile of Basement Rock**

The groundwater normally occurs in the upper layers of the weathered zone as a form of perched water and in the lower part of the weathering profile. The best aquifers are found in fault zones, where the coarse weathered layers are thicker.

3. GROUNDWATER QUALITY

Data of the water quality of the different types of wells in Basement are presented in Appendix 1.

The deep groundwater met in the boreholes is almost neutral and hard. Iron concentration is rather small but manganese almost always exceeds 0.1 ppm. The main problem with the deep groundwater is salinity which in most cases limits its domestic use.

The quality of shallow groundwater differs somewhat from that of deep groundwater. Shallow groundwater is generally slightly acid and rather soft. Fluoride and iron concentrations are small, but manganese concentration is commonly rather high. Salinity is much lower than in the deep groundwater and only in few cases exceeds the limit set for the domestic water.

The drillings made by recently acquired down-the-hole (DTH) hammer drill have brought new light to the distribution of salinity in the basement area. Table 1 shows the conductivity (EC) in different types of wells.

Table 1. Electrical conductivity of groundwater in different well types in basement

Well type	Aquifer depth	EC
Dug well	0 - 5 m	Characteristically less than 700 S/cm
Boreholes for hand-pump wells by DTH-rig	12 - 42 m an average 24 m	650 - 2130 S/cm an average 1460 S/cm
Boreholes for motor-pump wells	12 - 84 m (average 28 m)	800 - 9500 S/cm (average 4500 S/cm)

Electrical conductivity and salinity seem to increase with the depth of the aquifer. The recent boreholes by DTH-rig which are drilled on the hills and hillsides are generally less saline than the earlier boreholes drilled in the valleys and depressions. Thus the deep groundwater seems to be more fresh at the more elevated levels of terrain.

The fresh quality of dug wells supports the assumption that shallow groundwater is mostly perched water, which has no hydraulic connection with groundwater met in deep aquifers. Very saline shallow groundwater occurs in same places. The reasons for this may be natural salinity of the soil, the increased salinity caused by evaporation or the seeping deep groundwater from a weathered zone of a more elevated terrain.

4.
FLUCTUATION OF GROUNDWATER LEVEL

Fluctuation of groundwater level is an important factor to be considered when constructing dug and handauger wells though small storage capacity of perched aquifers seems to be the main reason for inadequate yields of a part of the dug wells during dry seasons.

The fluctuation of the groundwater level depends much on the type of the aquifer. Shallow ground water is in most cases perched water and the natural fluctuation is normally big, often several meters. Sometimes it is a question of infiltrated water seeping slowly downwards after the rainy season. It should also be noted that perched water aquifers are usually very small, and their use even by handpump wells may increase the fluctuation of the ground water considerably.

The deep groundwater level is quite constant and fluctuations of only about 2 meters have been observed.

5.
POTENTIAL ABSTRACTIONS

5.1 General

Hard crystalline and virtually impermeable basement rocks do not allow infiltrated groundwater to flow to a greater depth as is the case in the sedimentary formations. Thus groundwater level is commonly found at a shallow depth. The static water level in the boreholes is 9 m on an average, whilst perched water levels are close (1-3 m) to the surface at least during the rainy seasons.

Groundwater potential highly depends on the depth of the porous weathering profile. The depth of the weathering profile is commonly 20 -30 m but can be over 100 m in deep fault zones, which are porous and form aquifers with rather large groundwater storages as is the case in Magumchila in Masasi town.

5.2 Dug Wells

As mentioned earlier, water utilized by dug wells can be perched water or seeping groundwater from a weathered zone of a more elevated terrain. According to the WMP-77 most of the occurences located outside rivers and brooks are small and their average yield has been estimated to be 10 m^3/day, the variation limits being mostly 5...25 m^3/day.

The yields of the dug wells are normally good during the rainy season and some months after that, but less during the dry period. When the limited storage of the aquifer decreases the groundwater level sinks resulting a smaller yield. The whole aquifer can even dry up.

There are also high yielding dug wells in the Basement area with good water quality. Information of these wells should be collected to develop the use of these aquifers by constructing more wells at the same place. The wells with small yield or poor quality can be left for secondary use such as for washing or for livestock.

The reliability of dug wells can be improved by better well-siting but due to the nature of the perched water aquifers the possibilities are limited. The way of improving the present unsufficient dug wells must be solved well by well and exact instructions can be given only after detailed survey. Deepening an existing well into impermeable soil is naturally ineffective.

The fact that dug wells in Nachingwea District do not dry up so easily as in Masasi District, must be related to the structure of the surface layer of the weathered profile. The apparently more porous structure of weathering products can be caused by different mineralogical composition and grain size of the original rock. An important factor for better wells has also been the improved siting and the construction practices.

5.3 Handauger Wells

Due to the soil conditions there are only about 25 handauger wells in the Basement area. These wells are mostly sited in sandy river beds and therefore as many as 70 to 90 % of them were perennial at the end of exceptionally dry period in 1982.

5.4 DTH-rig Boreholes

Shallow boreholes (below 50 m) were proposed already in the WMP-77 and a cable tool rig or some type of compressed air rig to drill them.

A compressed air rig was purchased in 1984 for the Project to be used in the Basement area. The rig (Atlas Copco Aquadrill) is equipped with down-the-hole (DTH) hammer.

Altogether 37 boreholes have been drilled up to 31.12.1984. Boreholes are in Basement area nearby Masasi Town and along roads from Masasi to Newala and Tunduru. Boreholes were sited without any geophysical survey and this has caused a great number of unsuccessful boreholes. To find fault zones with good aquifer properties is commonly impossible without geophysical survey as the weathering profile hides the features created by faulted zones. Small amount of water was found almost in every borehole, but 8 were virtually dry. The distribution of yields of the boreholes is in Table 2. Detailed information of the boreholes is in Appendix 2.

Table 2. Yield distribution of DTH-rig boreholes

Dry	8	21.6 %
0.1 - 4.9 l/min	13	35.2 %
5.0 - 7.9 "	6	16.2 %
8.0 -	8	21.6 %
Saline water	1	2.7 %
caising broken	1	2.7 %
	37	100.0 %

To be sufficient for handpump, yield of wells drilled by DTH-rig should be 5-10 l/min.

Boreholes were drilled on hills and hillsides and the depth of the boreholes is 40.0 m on average. Drilling was usually extended to the fresh rock. Water was usually found at the depth from 12 to 42 m with the average depth of 24.5 m. Static water level varies from 1 to 24 with an average of 7.8 m. As the static water level in the boreholes drilled earlier in the valleys is 9.0 m on average, the profile of water table seems to resemble the profile of surface, water table being at about the same depth on hills as in valleys. This gives rise to opinion that permeability of weathered crust is low.

Casing has been used only in the upper part of the borehole to prevent collapse and the main part of borehole is drilled without casing. Casings are 10 m long on average.

Boreholes have been flushed by air and yield has been measured by V-notch. Pump installation group has testpumped the wells by pumping one hour with handpump. Testpumping reports are made by the group.

Filter sand has been used between the slotted PVC screens and the borehole walls. Filter sand has been screened near Nanganga quarry from river sand. The borehole is drilled with 115 mm bit and outer diameter of PVC-pipe is 90 mm, so the space for filter sand is only 12 mm thick. Infiltration of fine grained soil through the filter sand is obvious, therefore screens should be used only in places where coarse grained aquifers or open fractures are met. Thickness of gravel pack could be increased by drilling 6" boreholes, which is possible with the rig.

It seems, that drilling without any prior surveys gives relatively poor results. Suitable survey methods such as seismic sounding shall be used to make the operation of the rig more economical.

5.5 Production Boreholes for Piped Schemes

Yields of the boreholes sited and drilled in deep fault zones in valleys have been relatively high (100-400 m^3/d) in many places but high salinity has prevented the use of these boreholes (table 3). Acceptable quality together with high yield have been met only in Magumchila wellfield in Masasi, in Mkumba Shamba wellfield in Nachingwea and in Chiwambo at the foot of Makonde Plateau. High yielding but saline boreholes have been drilled e.g. around Nachingwea town and in Lukuledi village. A large number of boreholes and comprehensive geophysical survey bear evidence that wellfields with high yield and acceptable quality are exceptional in Basement.

Table 3. Yield of boreholes

0 - 50 m^3/day	15	18.8 %
51 - 100 "	12	15.0 %
101 - 200 "	25	31.2 %
201 - 400 "	25	31.2 %
401 - 800 "	3	3.8 %
> 800 "	-	-
Total	80	100.0 %

The table includes boreholes mentioned in the WMP-77 and boreholes drilled since 1978 with adequate testpumping results.

6.
GROUNDWATER RESOURCES OF NACHINGWEA URBAN AREA

6.1 Present Water Supply

The present water supply of the Nachingwea town is based on groundwater. There are four wellfields each of them with several boreholes. When testpumpings were done in November 1984 only Mkumba Shamba wellfield was in use, and there only 3 pumps were pumping water while others were broken. Other wellfields are Mkumba Pacha, Kihue and Nambemba. Water is suitable for domestic use only in Mkumba Shamba and in one borehole in Mkumba Pacha whereas water of Kihue are Nambemba is too saline. There are 25 handpump wells in Nachingwea town which are an important source of water for people because piped water supply is unreliable owing to leakages and poor condition of pipeline network.

According to information given by local authorities the daily pumping during Sept.-Dec. 1984 has been 20 hours yielding about 600-750 m^3. Shortage of diesel and electrical power supply from Tanesco have caused even smaller supplies than 600 m^3/d. The other wellfields, Mkumba Pacha, Nambemba and Kihue, had not been pumped for several months.

The water supply system and the wellfields are shown in Figure 2.

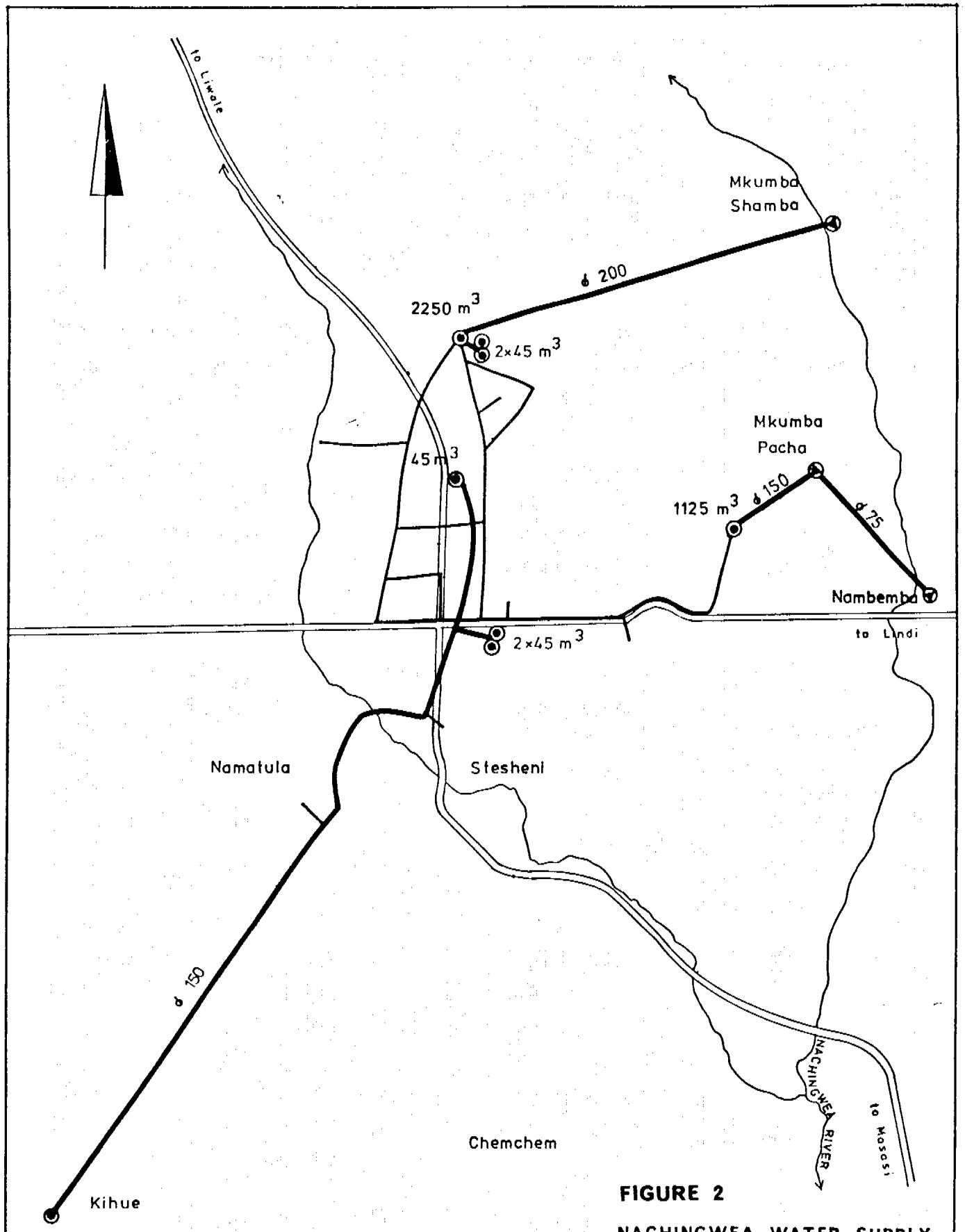


FIGURE 2

NACHINGWEA WATER SUPPLY

1 : 50000

6.2 Mkumba Shamba Wellfield

The wellfield comprises 8 boreholes equipped with pumps, which have been used during recent years, but now only three of them are operating. Testpumpings of 4 wells constructed by Finnwater were done in November 1984 in order to investigate the yield of the wellfield.

Lay-out of the wellfield is presented in Figure 3, the list of boreholes in Appendix 3 and results of testpumping in Appendix 4.

Static water levels were about the same as informed in the original borehole reports. So far the continued pumping has not had any effect on the groundwater level.

The total yield of the pumps is 47.1 m^3/h, which is 72 % of the estimated total yield of boreholes (65 m^3/h).

6.2.1 Detailed Description of Testpumpings

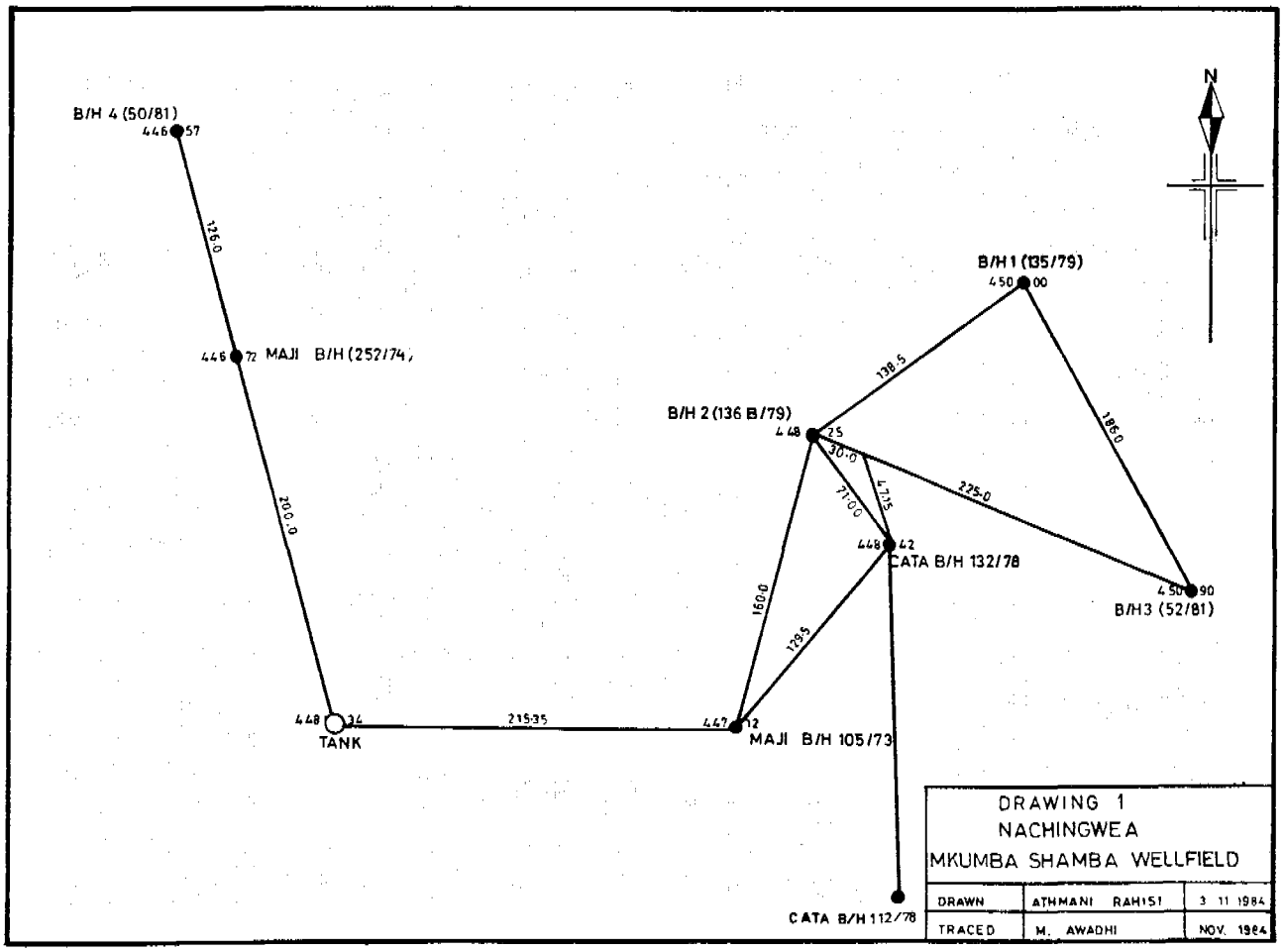
Well no. 1.

A 3-step pumping test was done 24.10.1984 to determine well equation. Yield was increased step by step 1/3 Q max., 2/3 Q max., Q max. Each step lasted 2 hours (Figure 4, p. 14).

Drawdown was 10.83 m in well 1 and 10.14 m in well 2. There seems to be a straight connection between wells 1 and 2.

Plotting of the specific drawdown against the yield does not give a straight line relation. This is probably due to turbulent flow in an open fracture in rock. The fracture was identified during drilling work of wells 1 and 2. The opening gives explanation to good connections between these wells.

FIGURE 3 **Mkumba Shamba Wellfield**



Single stage pumping tests were done after a 3-stage test. First pumping test was performed 1.2.11.1984 by the pump of the well. Drawdown was 13.08 m as a result of 24 hours pumping. Discharge during first 4 hours of pumping was 25.7 m^3/h and decreased later being constant 21.2 m^3/h. Total quantity of pumped water was 517 m^3 in 24 hours. Recovering time was 6 hours (Figure 5). The value of transmissivity is 24.2 m^2/day according to the interpretation of pumping and recovery test data (Figures 10 and 11).

Changes of water level in well 2 were similar to that in testpumped well. In well 2 the drawdown was 12.23 m. During the pumping the water level in well 2 was about 1 m higher than in well 1. Static water levels are the same in both wells.

Another testpumping was done on 22.11.1984 by installing a high capacity pump in the well. At the beginning the discharge was 42.3 m^3/h thereafter stabilizing at 36 m^3/h. Pumping time was 14 h 50 min. Drawdown was 22.5 m. Water level reached the pump level after 14 h 50 min pumping when the pumping was stopped. Recovering time was 15 h (Figure 5).

Well no. 2

Single stage pumping test lasting 26 h 10 min was done in from 31.10.1984 to 1.11.1984. Discharge was 7.4 m^3/h giving a drawdown of 9.95 m. Drawdown in well 1 was 2.93 m, which is about the same, if well 1 were pumped with the capacity of 7...8 m^3/h. Recovery was one hour (Figure 6).

Well no. 3

A 3-step pumping test was done 25.10.1984 to determine well equation (Figure 7). Drawdown was 7.22 m. Determination of well losses gave unreliable results possibly due to turbulent flow in the fractures of the bedrock.

Single stage pumping test was done during 22..23.11.1984 lasting 16 h 40 min. Drawdown was 10.12 m with a discharge of 10 m^3/h. Recovery time was about 4 h. Pumping had no effect on water levels in wells 1 and 2 (Figure 8). The value of transmissivity is 18.1 m^2/day according to the interpretation of pumping test data (Figure 12) and 14.7 m^2/day according to the recovery test data (Figure 13).

Well no. 4

Single stage pumping test was performed between 31.10.1984 and 1.11.1984. Drawdown of 17.2 m was gained with a yield of 6.7 m^3/h in 16 hours (Figure 9). The pump in the well was not working properly and it was removed. When opened the pump was found to be worn out. The pump had been installed in February 1983.

6.2.2 Maji Wells

The pumps of Maji wells were broken and no testpumping were made. Due to Monolift pumps it was not possible to measure water levels in the wells.

6.2.3 Cata Wells

There are two wells for water supply of Cata factories in the Mkumba Shamba wellfield. One of these is in the vicinity of well no. 2. At the time when testpumpings were performed Cata wells could not be started because the main switch was broken.

6.2.4 Conclusions

The testpumpings carried out in Mkumba Shamba wellfield were not sufficient in terms of length and capacity. Also only 4 of the 8 boreholes were possible to be tested. However, based on the results of the stestpumping and the earlier data, following conclusions can be made:

1. Wells 1 and 2 are hydraulically interconnected and tapping the same aquifer whereas wells 3 and 4 are independent. Although not confirmed, CATA boreholes may be tapping the same aquifer as wells 1 and 2.

2. The combined capacity of wells 1 and 2 may be as much as about 36 m^3/h but at least 20 m^3/h. The whole amount can be pumped from well 1.

3. The yield of the borehole field is estimated at about 1,500 m^3/d. It may be possible to increase the yield further by drilling new boreholes.

4. With Mkumba Shamba wellfield (1,500 m^3/d), Mkumba Pacha wellfield (600 m^3/d) and the 25 shallow wells (150 m^3/d) the total present water resources in Nachingwea can be estimated at about 2,250 m^3/d. There may be possibilities to increase this further.

5. Long term test pumpings are needed to verify the above estimates.

FIGURE 4 **3-Stage Testpumping of Well 1, Mkumba Shamba**

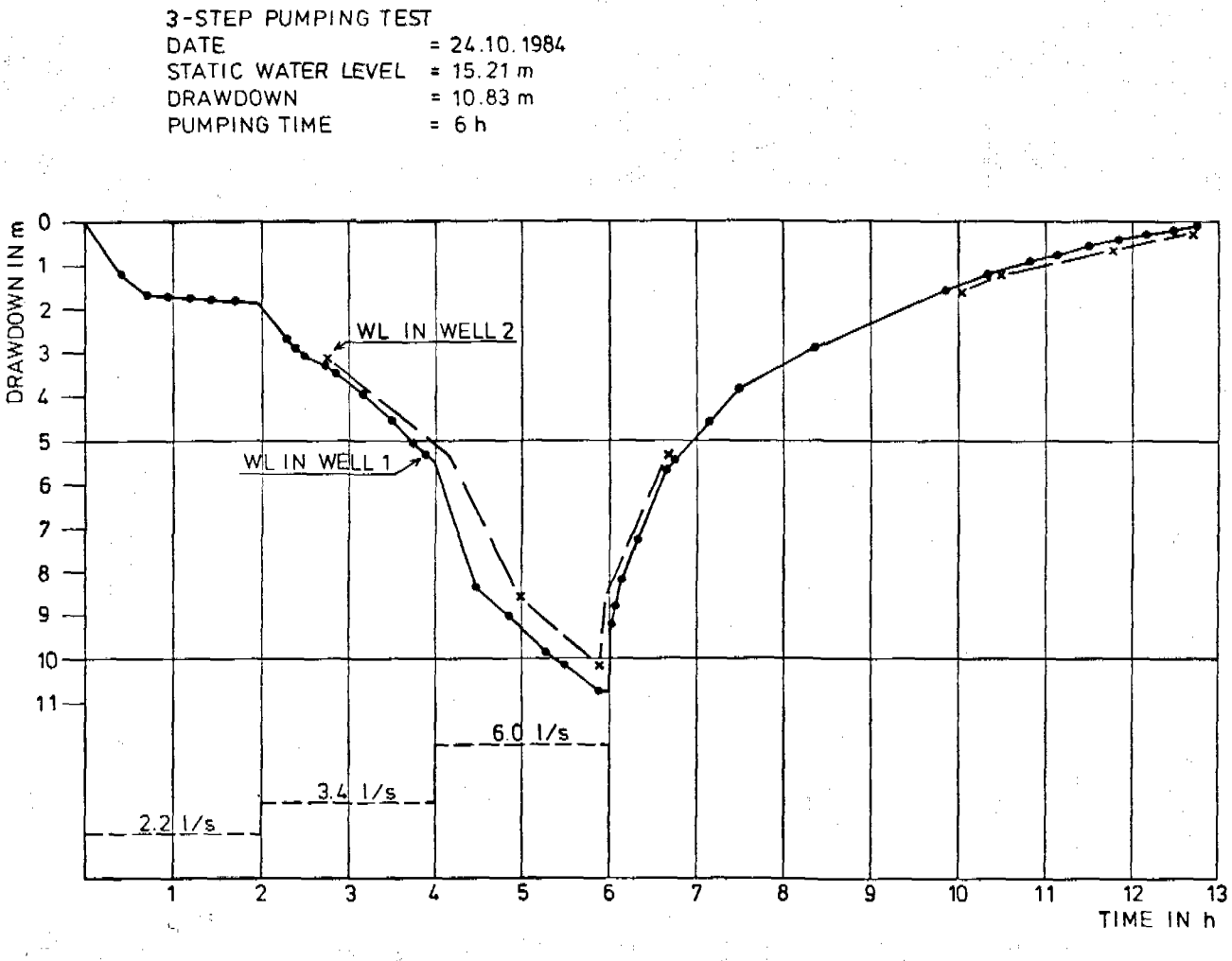
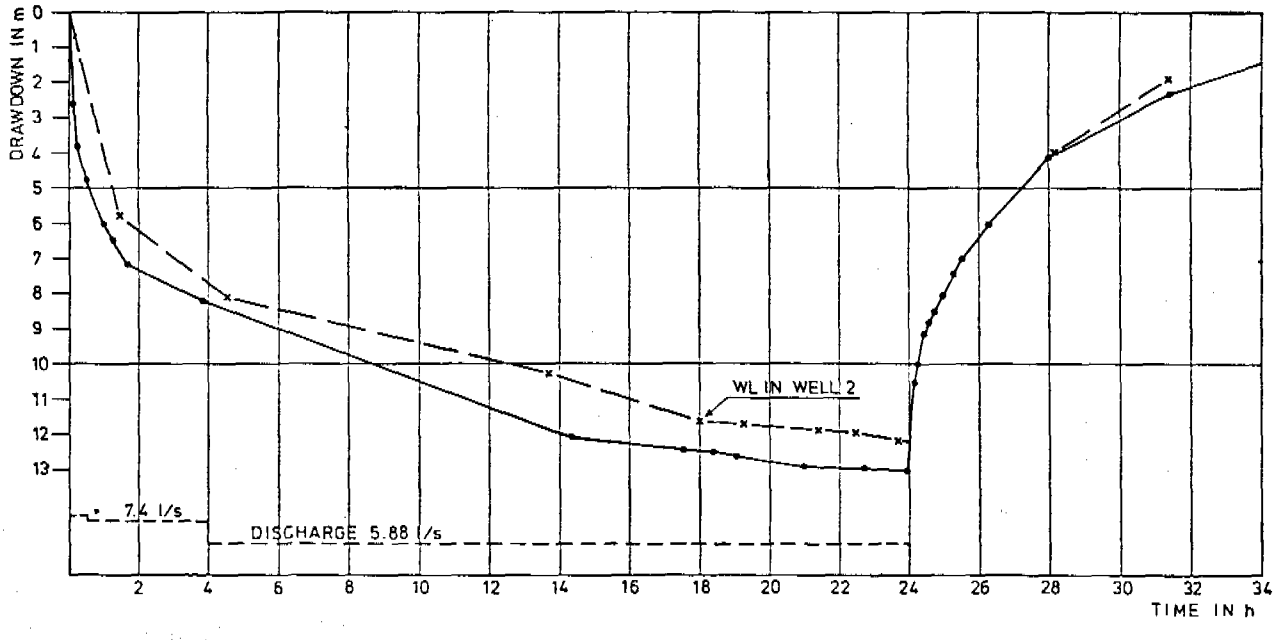


FIGURE 5 Single Stage Testpumpings of Well 1, Mkumba Shamba

DATE = 1. ...2.11.1984
STATIC WATER LEVEL = 14.77 m
DRAWDOWN = 13.08 m
PUMPING TIME = 24 h



DATE = 22.11.1984
STATIC WATER LEVEL = 16.63 m
DRAWDOWN = 22.50 m
PUMPING TIME = 14 h 50 min

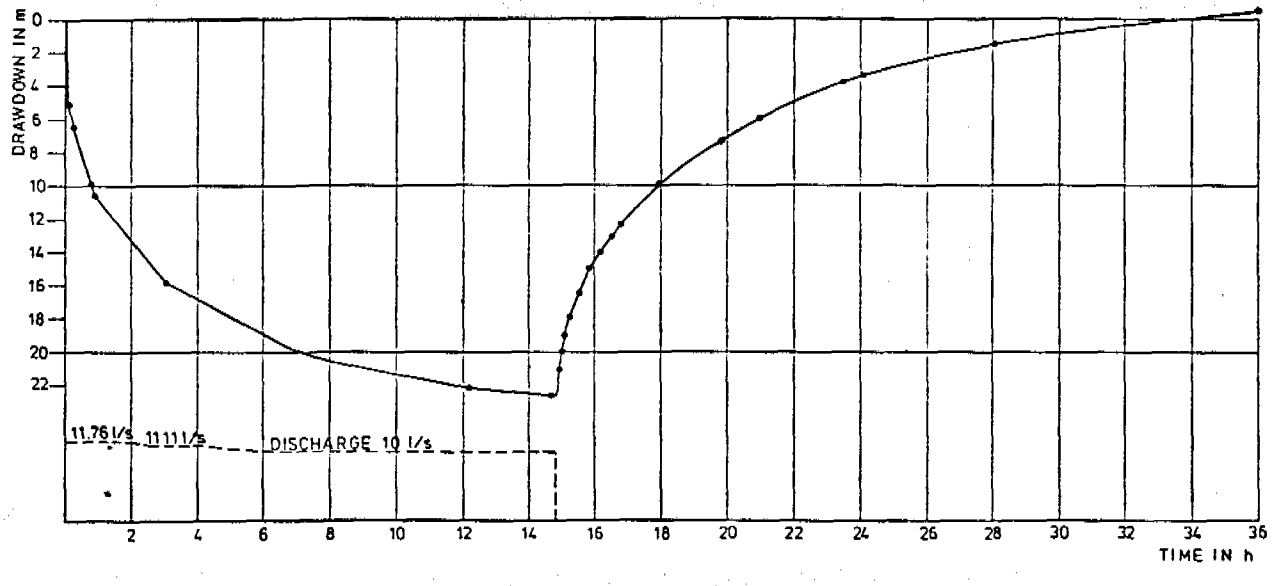


FIGURE 6 **Single Stage Testpumpings of Well 2, Mkumba Shamba**

DATE = 31.10....1.11.1984
STATIC WATER LEVEL = 13.34 m
DRAWDOWN = 9.95 m
PUMPING TIME = 26h10 min

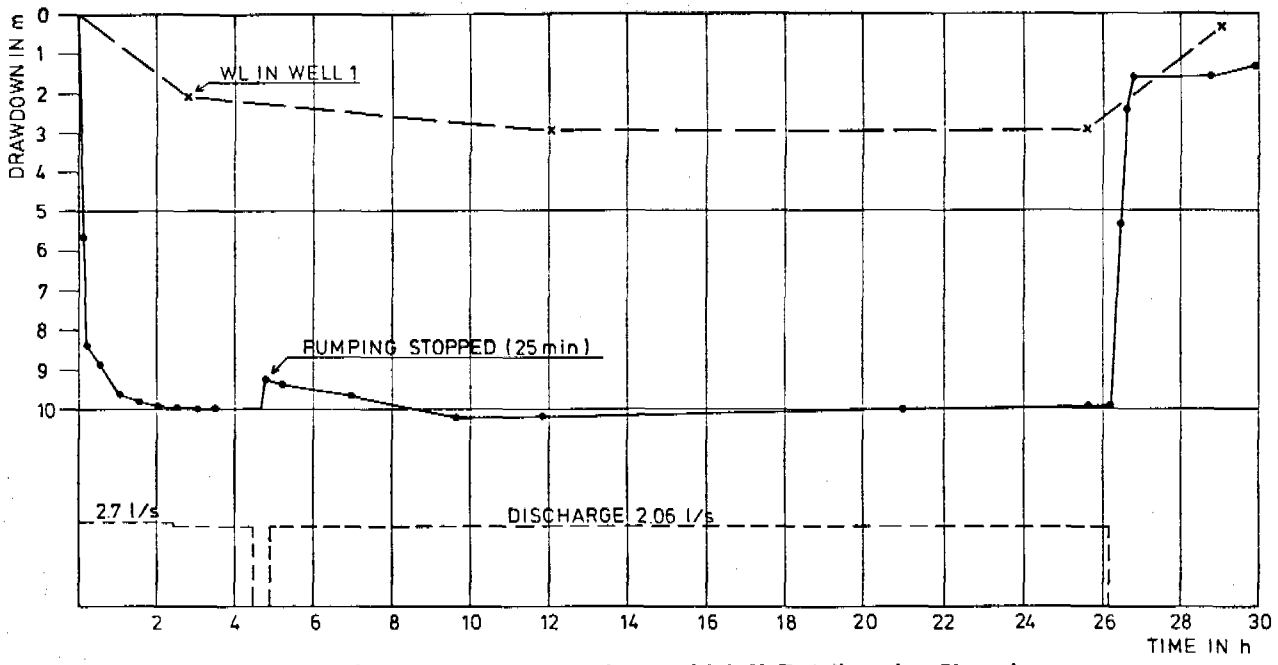


FIGURE 7 **3-Stage Testpumpings of Well 3, Mkumba Shamba**

3-STEP PUMPING TEST
DATE = 25.10.1984
STATIC WATER LEVEL = 12.66 m
DRAWDOWN = 7.22 m
PUMPING TIME = 6 h

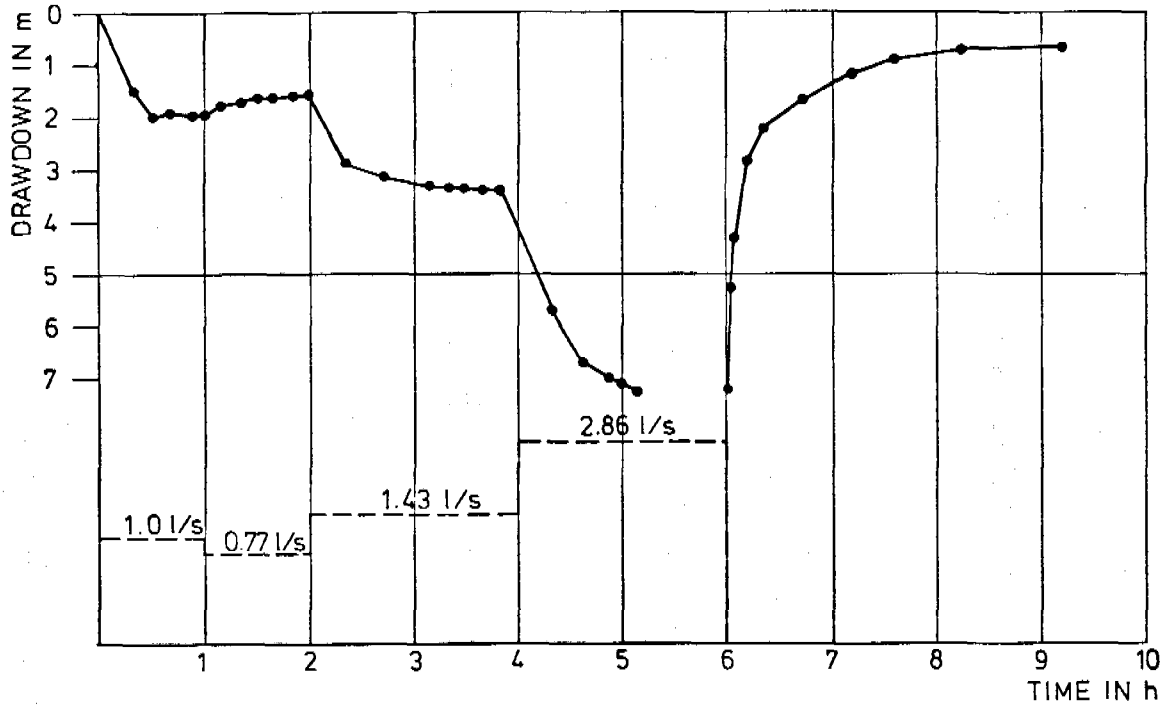


FIGURE 8 **Single Stage Testpumpings of Well 3, Mkumba Shamba**

DATE = 22.11.1984
STATIC WATER LEVEL = 13.38 m
DRAWDOWN = 10.12 m
PUMPING TIME = 16 h 40 min

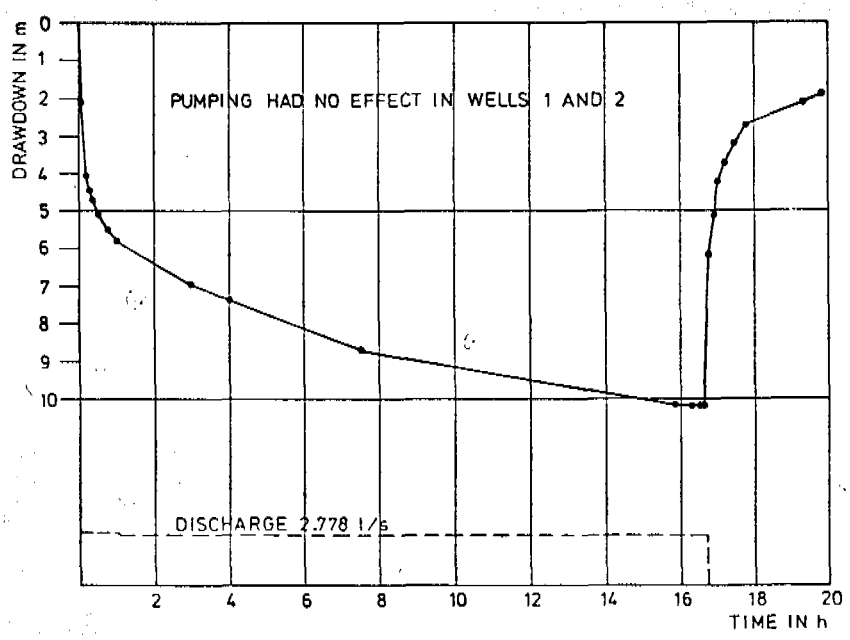


FIGURE 9 **Single Stage Testpumpings of Well 4, Mkumba Shamba**

DATE = 31.10.1984
STATIC WATER LEVEL = 1.17 m
DRAWDOWN = 17.20 m
PUMPING TIME = 15 h 40 min

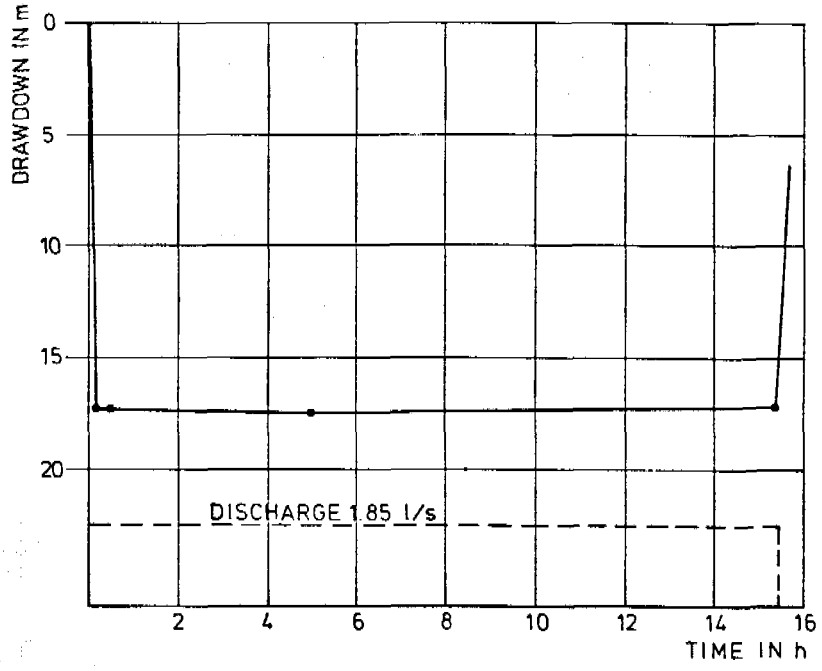


FIGURE 10 Interpretation of Testpumping Data of Well 1, Mkumba Shamba

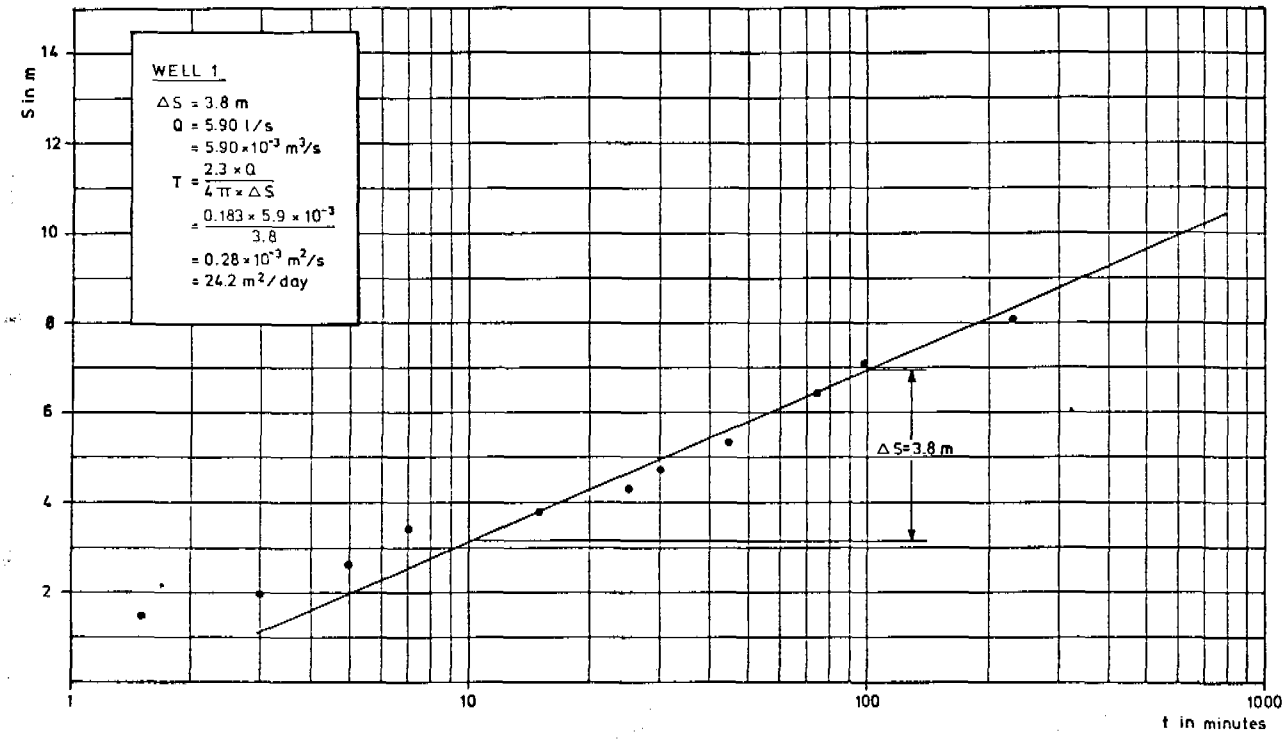


FIGURE 11 Interpretation of Recovery Test Data of Well 1, Mkumba Shamba

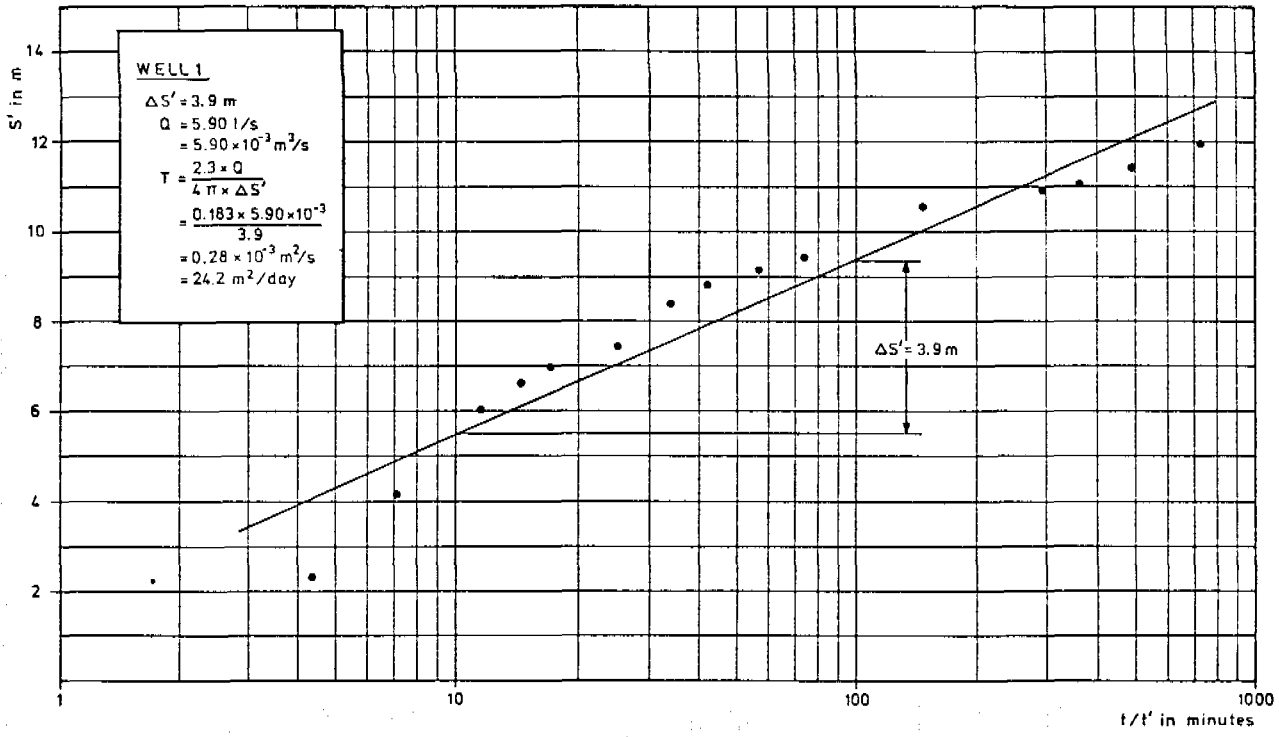


FIGURE 12 Interpretation of Testpumping Data of Well 3, Mkumba Shamba

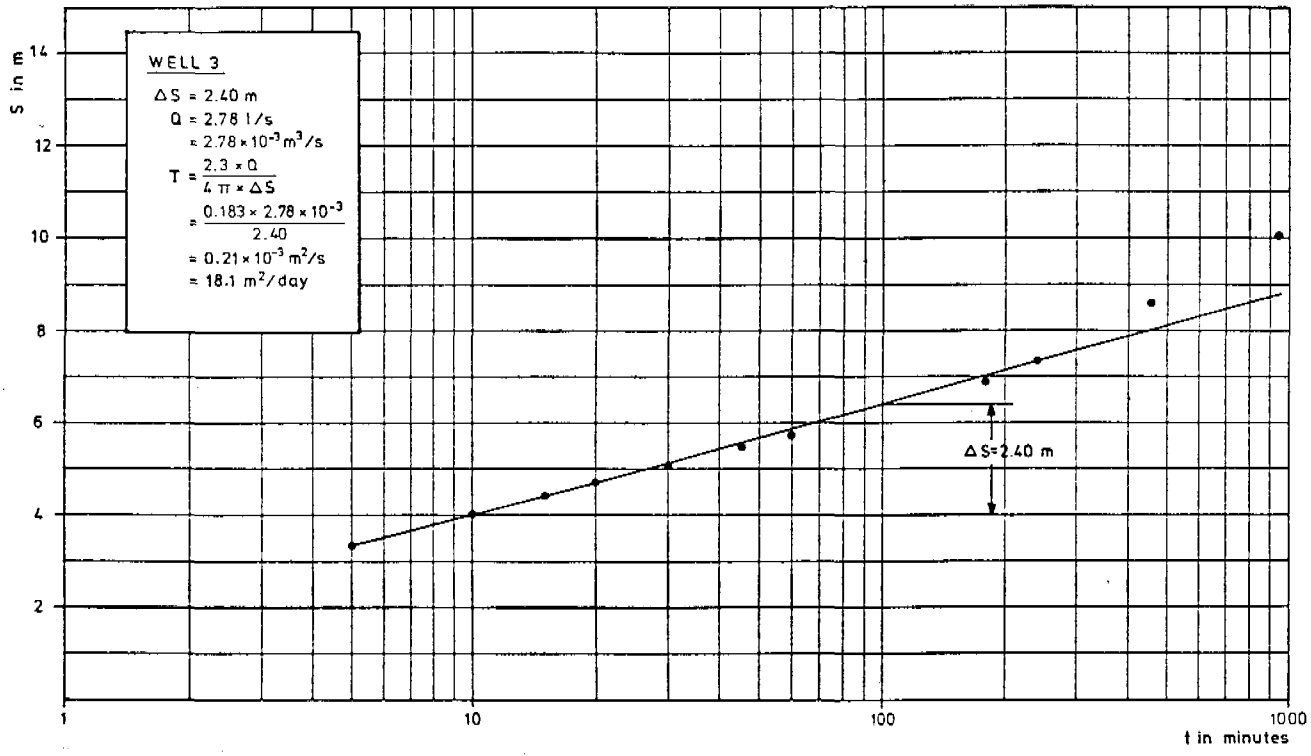
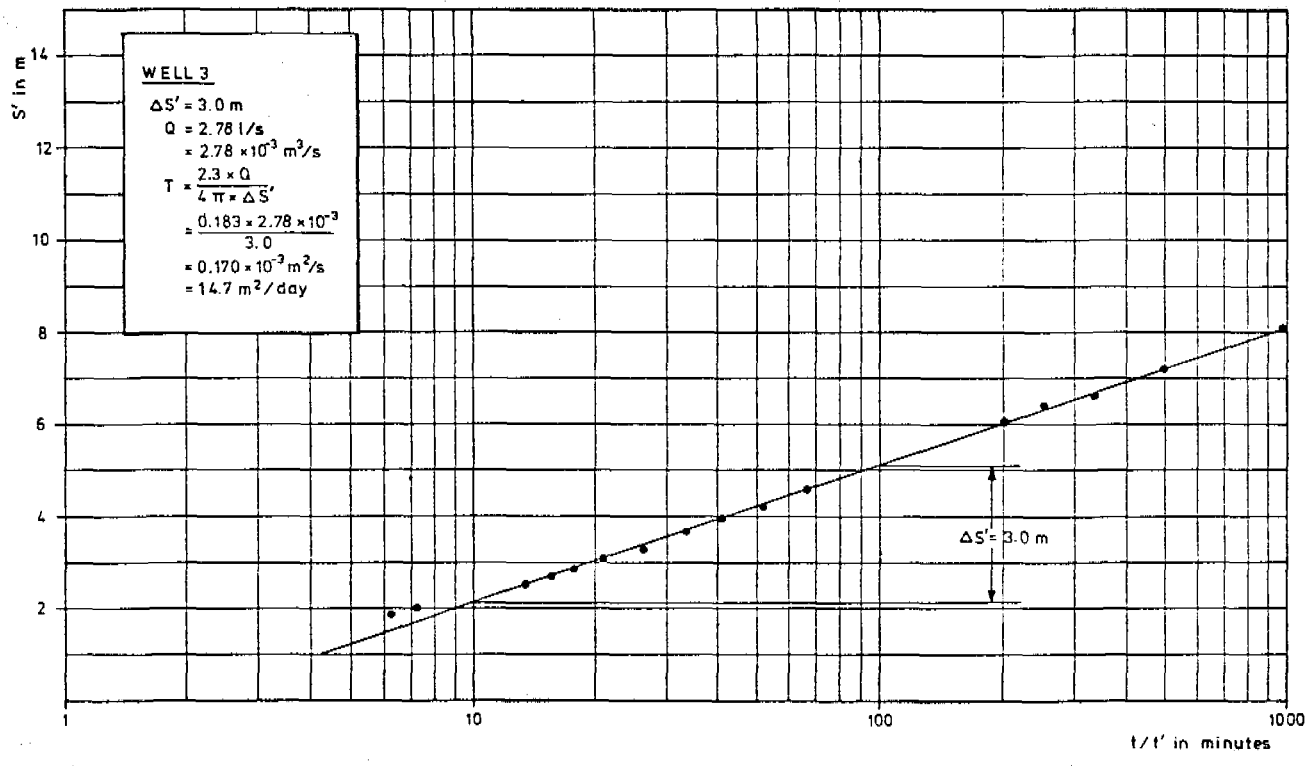


FIGURE 13 Interpretation of Recovery Test Data of Well 3, Mkumba Shamba



7.
GROUNDWATER RESOURCES OF MASASI URBAN AREA

7.1 General

According to the WMP up to 1,000 m^3/day of groundwater is available from boreholes in the area between Chilonji and Mtandi Hills. Further in the area between Mtandi and Masasi Hills and in the area south-west of Chilonji Hill good amounts of water have been found, but extensive salinity has prevented their use.

There are 5 wells in the Magumchila wellfield (Appendix 5). Construction work of Masasi Urban water supply was started in May 1978. Three boreholes were drilled in Magumchila area between Chilonji and Mtandi Hills. Pumping from the first borehole commenced in December 1978. Pumps for two further boroholes were installed in 1979. A fourth borehole drilled in 1975 has been connected to the system. Cata borehole is in the same wellfield. Boreholes (5 nos) are drilled into deep fault zones (Figures 14 and 15).

In addition to Magumchila wellfield the other water sources of Masasi town are Masasi dam and about 40 handpump wells within the town area. The present productions of Magumchila and Masasi Dam, when in operation, are 600 m^3/d and 150 m^3/d respectively. The handpump wells supplement the water supply with 100-200 m^3/d.

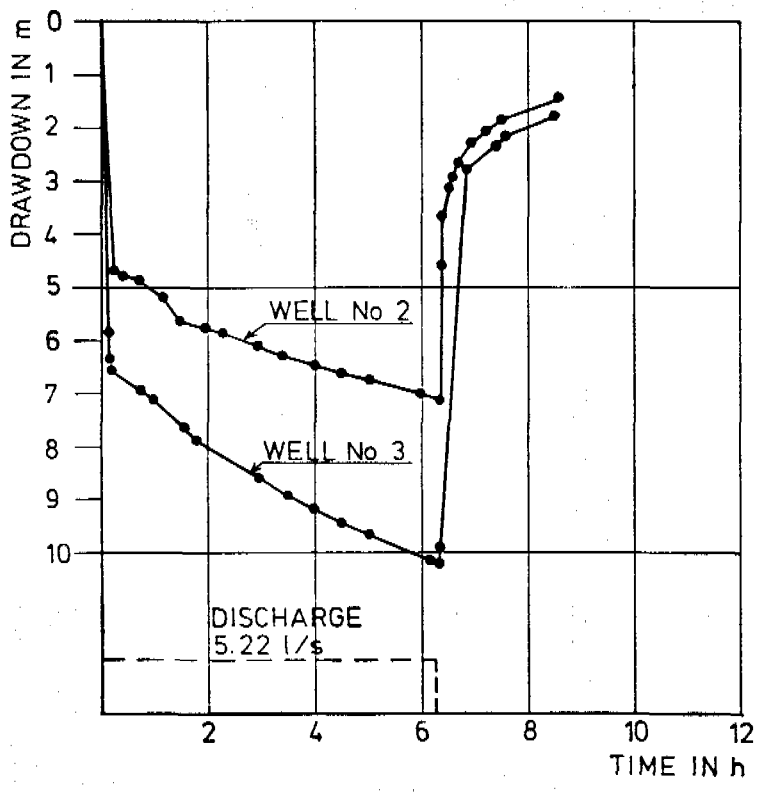
7.2 Testpumping of Magumchila Wellfield

The wells have been testpumped already earlier after the completion of the wells (Appendix 6).

Testpumping was made on 28.11.1984 in two boreholes to check the yield of the wells. Due to the shortage of fuel boreholes nos. 2 and 3 were pumped simultaneously. Pumping time was 6 h 20 min. Drawdown in borehole no. 2 was 7.12 m and in no. 3 10.14 m (Figure 16). Total yield was 18.8 m^3/h, which indicates that the pumps and wells were in a good condition since the designed capacity of the pumps is 2 x 9 m^3/h.

FIGURE 16 **Testpumping of Wells 2 and 3 Simultaneously, Magumchila**

DATE = 28.11.1984
STATIC WATER LEVEL: WELL 2 = 13.6 m, WELL 3 = 14.4 m
DRAWDOWN: WELL 2 = 7.12 m, WELL 3 = 10.14 m
PUMPING TIME = 6 h 20 min



Pumps in borehole no. 1 and in the Maji borehole no. Ma 605 were out of order and could not be testpumped. None of the pumps in the whole wellfield had been running since 20.10.1984, because of the fuel shortage.

The testpumpings were very incomprehensive but it can be noted that the static water levels were reported about the same in the original borehole reports. Pumping has continued for many years and has not had any effect on groundwater levels. The results also indicate the earlier estimate of the yield of the wellfield - 1,000 m^3/d - is correct.

During the testpumping it was noticed that the boreholes, especially borehole no. 4, will soon require rehabilitation.

8.
RECOMMENDATIONS FOR THE DEVELOPMENT OF GROUNDWATER RESOURCES IN NACHINGWEA AND MASASI

Long-term Testpumping

Long term testpumpings together with groundwater level observations should be started in the wellfields of Mkumba Shamba and Magumchila. The testpumping should be done by the production pumps during a period of 2-3 months. At that time special attention should be given to the maintenance and fuel or power supply of the pumps. Water meters shall be installed for each pump as well as for the combined yields. Groundwater level can be measured by small size deeper through the holes drilled in the covers of the wells. After the test period observations on water levels and amounts of water pumped from the wellfields should be made at least once a month and continued for some years.

Nachinqwea

It seems to be possible to increase abstraction at Mkumba Shamba and Mkumba Pacha by extending the wellfields. Sites for the additional boreholes can be decided, based on the earlier drilling reports.

Masasi

Other potential sites in the area around Masasi Hills should be investigated in spite of seismic soundings, which were not promising. This can be done in connection of the ongoing DTH-rig programme so that drilling for the handpump wells should be carried out in the geologically promissing areas near Masasi. High yielding boreholes should be tested propely in order to estabilish the potential of each aquifer. Seismic sounding should be used for siting the boreholes in areas, where seismic survey has not been carried out earlier.

Hand Pump Wells

Handpump wells have proved to be a necessary and feasible stand-by system in both Masasi and Nachingwea towns. Their number should be increased.

WATER QUALITY OF SEPARATE WELL TYPES IN BASEMENT

		Borehole	Dug well
EC S/cm	- 300	-	12
	301 - 700	1	12
	700 - 2000	23	6
	2001 - 5000	17	3
	5001 -	9	-
		50	33
Hardness mE_q/l	- 2.0	-	6
	2.1 - 5.0	7	10
	5.1 - 10.0	7	2
	10.1 - 15.0	6	1
	15.1 -	18	3
		38	22
Cl mg/l	- 100	7	10
	101 - 200	2	3
	201 - 400	9	7
	401 - 800	9	3
	801 -	9	2
		36	25
pH	- 6.5	2	8
	6.6 - 70	7	11
	7.1 - 7.5	13	9
	7.6 - 8.0	14	1
	8.1 -	7	4
		43	33
F mg/l	- 0.2	3	3
	0.21 - 0.50	6	7
	0.51 - 0.80	10	7
	0.81 - 1.20	12	5
	1.21	7	1
		38	23
SO_4 mg/l	- 50	24	16
	51 - 100	3	-
	101 - 150	1	4
	151 - 200	-	1
	- 201	4	1
		32	22
NH4 mg/l	- 0.20	3	6
	0.21 - 0.50	7	11
	0.51 - 0.80	6	2
	0.81 - 1.20	5	8
	1.21 -	7	4
		28	31

		Borehole	Dug well
Iron Mg/l	- 0.10	12	4
	0.11 - 0.20	8	3
	0.21 - 0.50	14	3
	0.51 - 1.00	5	2
	1.01 -	5	8
		44	20
Mn mg/l	- 0.05	8	3
	0.06 - 0.10	1	-
	0.11 - 0.50	14	5
	0.51 - 1.00	2	1
	1.01 -	10	9
		35	18
Coli-bact per 100 ml	NIL	3	3
	- 1	-	-
	2 - 5	2	1
	6 - 10	-	-
	10 -	-	16
		5	20

BOREHOLES DRILLED BY DTH-RIG UP TO 31.12.1984

B.H no.	Depth m	SWL m	Depth of main aquifer m	Discharge l/min	Depth of casing m	EC S/cm
1	42	1.0	22	7	24	
2	48			0.15	5	
3	45			Dry	11	
4	30	4.6	22	2	8	
5	31	4.0	22	5	8	
6	36	4.2	22	2	8	
7	33	-		Dry	6	
8	30			Dry	8	
9	51			Dry	9	
10	38	22	22	8	19	
11	24	-	Casing broken	Dry	19	
12	29	2	18	5	6	
13	39	1.8	18	2	9	
14	12	-		Dry		
15	16	1.5	16	5	14	1 550
16	51	7	37	7	5.5	
17	15	6	10	> 20	11	650
18	48	17	42	> 10	5.5	725
19	51	-	-	Dry	7.0	
20	26	5	15	14	9.0	1 720
21	30	3	21	3.6	4.5	
22	45			Dry		
23	35	5.5	17	1		1 836
24	32	6	24	5		2 130
25	42	3	21	1		1 090
26	50	14	32	2		
27	39	7	24	22		1 859
28	39	18	28	1		
29	54	13	36	8		1 365
30	70			1		
31	27	7	12	> 15		1 593
32	42	12	24	1		
33	51			Dry		
34	33		30	27		11 060
35	42	12	29	4		1 460
36	41	11	33	18		1 560
37	51		39	1		

BOREHOLES OF MKUMBA SHAMBA

NACHINGWEA NOV. 1984

WELL NO.	BH NO.	DEPTH M	PUMP TYPE	YIELD OF PUMPS	YIELD OF BOREHOLES
1	135/79	77	Elect. submers.	23.0 m^3/h	25[1] m^3/h
2	136 B/79	92	Elect. submers.	7.4 m^3/h	15[1] m^3/h
3	52/81	70	Elect. submers.	10.0 m^3/h	15 m^3/h
4	50/81	90	Elect. submers.	6.7 m^3/h	10 m^3/h
Maji	105/75	94	Elect. monolift	no inform.	22.5 m^3/h
Maji	252/74	124	Diesel monolift	"	12.0 m^3/h
Cata	132/78	134	Elect. submers.	"	16.4 m^3/h
Cata	112/78	154	Elect. submers.	"	4.6 m^3/h
			TOTAL	47.1 m^3/h	120.5 m^3/h

CONDITION OF PUMPS

No. 1 OK
No. 2 Worn out
No. 3 OK
No. 4 Pump removed, worn out

Maji 105/75 Broken
Maji 252/74 Broken
Cata 132/78 Not in use, main switch broken
Cata 112/78 "

1) Wells 1 and 2 use the same aquifer, total yield 35 - 40 m^3/h.

APPENDIX 3

TESTPUMPING RESULTS OF
MKUMBA SHAMBA, NACHINGWEA

WELL NO.	DATE	PUMPING TIME	SWL m	DISCHARGE m^3/h	DRAWDOWN m	SPECIFIC CAPACITY $m^3/h \times m$	TRANSMISSIVITY $m^3/day \times m$
1	1..2.11.84	24 h	14.77	23.0	13.08	1.65	24.2
1	22.1.84	14 h 50 min	16.63	37.0	22.50	1.60	22.6
2	31.10.84	26 h 10 min	13.34	7.4	9.95	0.75	
3	22.11.84	16 h 40 min	13.38	10.12	10.12	1.00	14.7...18.1
4	31.10.84	16 h	1.17	6.7	17.20	0.39	
1	6.12.80	24 h	15.0	12.0	7.87	1.52	-
2	14.1.80	24 h	14.5	12.0	19.81	0.61	-
Maji 105/75			18.3	22.5	30.50	0.74	-
Maji 252/74			0.52	12.0	29.50	0.41	-
Cata 132/78			22.6	16.3	39.10	0.42	-
Cata 112/78			42.4	4.6	38.25	0.12	-

APPENDIX 4

WELLS OF MAGUMCHILA WELLFIELD, MASASI

WELL NO.	B.H. NO.	DEPTH M	PUMP TYPE	YIELD OF PUMP M^3/H
1	Ma 603	65	Elect. submers	10.0
2	C 309	65	Elect. submers.	10.0
3	Ma 601	49.5	Elect. submers.	10.0
Maji	Ma 605	59.3	Diesel monolift	18.0
Cata	Ma 608			10.0

TESTPUMPING OF WELLS IN MAGUMCHILA WELLFIELD

WELL NO	DATE	PUMPING TIME	SWL M	DISCHARGE M^3/DAY	DRAWDOWN M	SPECIFIC CAPACITY M^3/H x M	TRANS-MISSIVITY M^3/DAY x M
1	29.9.1978	6 h	18.3	220	17.3	0.53	9.6
2	1974	178 h	10.0	260		2.63	33.9
3	25.8.1978	1 h	15.0	225			
Maji	17.10.1978	10 h	12.0	430	16.0	1.1	16
Cata							
1	28.11.1984		13.7				
2	28.11.1984	6 h 20 min	13.6	216	7.12		
3	28.11.1984	6 h 20 min	14.4	216	10.14		

APPENDIX 6