

**Aftercare Study on
the National Water Master Plan**

MAJI MAZURI (1/1)

**Urban Water Supply
System Survey**

General

Name of Urban Centre : *Maji Mazuri (Kabiyet - Benonin W/S)*

Organisation/Water Undertaker : *MOWR*

District : *Koibatek*

Location: *Maji Mazuri*

Map (1/50,000) Ref. no : *118/2*

Co-ordinates *X 35° 42' Y S 00° 00'*

Drainage Sub-basin : *2ED*

Existing facilities:

Source: *Kapkor river*

Type of Intake : *Weir* Elevation : *2350m.*

Raw water system : *Gravity*

H: *m* Dia : *150,100 & 80mm*

Treatment Process : *None*

The whole system is on gravity. No chlorination is done. No quality control is carried out

Designed Capacity: *260m³/d (Intake capacity)*

Treated water/Distribution system

Area covered: *5 km²*

Distribution mains (80mm and above): *mm to mm*

Total length : *All mains smaller than 80mm dia.*

Service main about 17 km

UFW (Estimated) : *m³/d*

Consumers - Total no : *96*

Metered :

Unmetered : *96*

Working Meters: *All consumers pay flat rate.*

Water production : *m³/d*

Remark :

Service area population : *10,000*

Population served : *2,000*

Financial/Revenue:

O & M costs :

Revenue earned :

Revenue collected : *Kshs 52,795 - 1997*

Rehabilitation required/costs

Kshs Estimated

i) New supply system. (See future development plan)

	<i>120,000,000</i>
Total	<i>120,000,000</i>

Future development plan

Source : *Kapkor River*

Treatment : *Full conventional* Capacity : *550 m³/d*

Design year : *2,000*

Design population: *11,00*

Remarks

The existing scheme was constructed in 1950's and rehabilitated in 1995. The gravity trunk main serves both the Kenya Railways Corporation as well as Kabiyet - Benoin community. Lack of air valves and washouts has resulted in frequent interruption of supply. Absence of any form of treatment of the raw water makes it susceptible to water borne diseases.

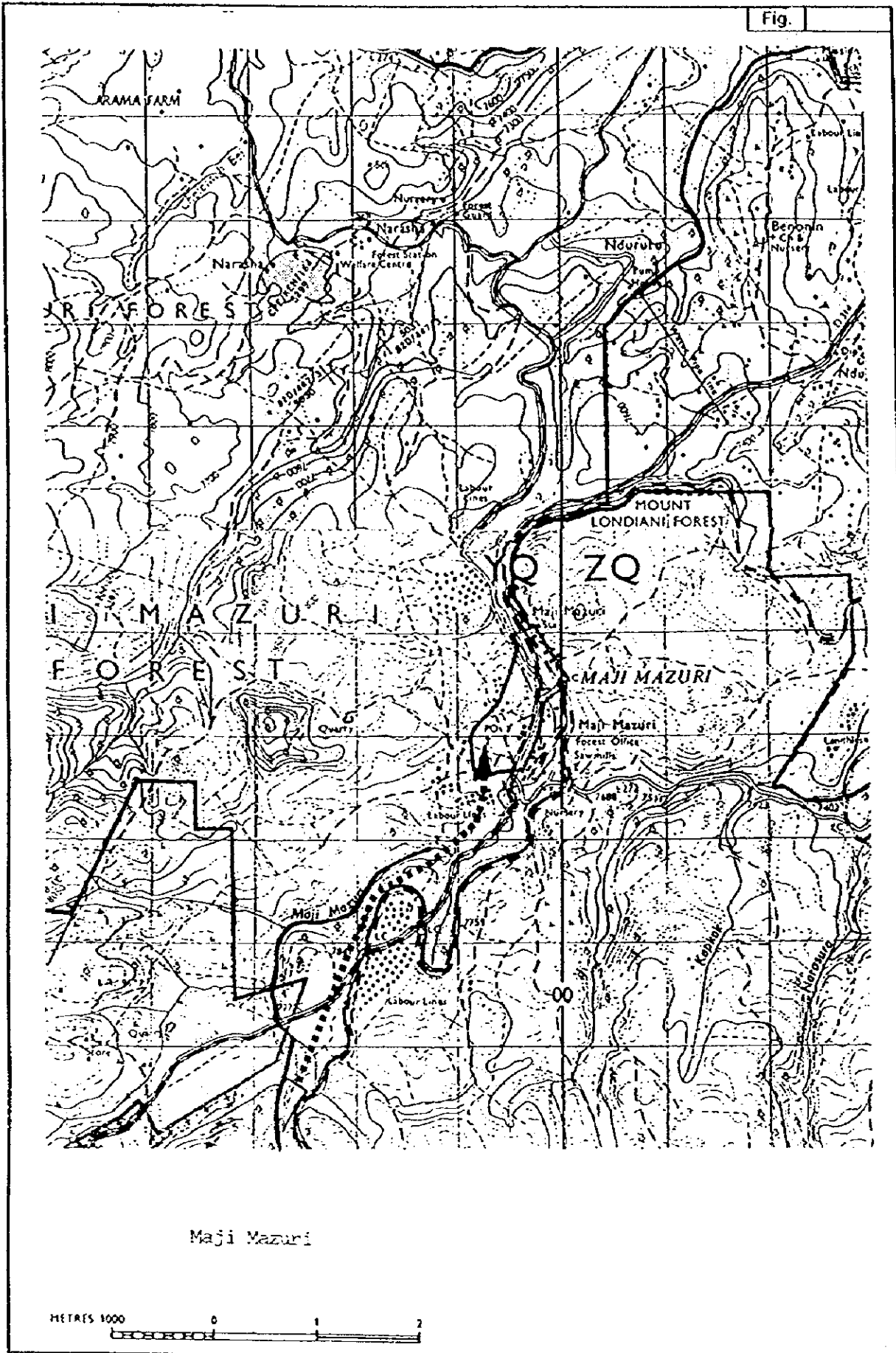


Fig.

**Aftercare Study on
the National Water Master Plan**

ELDAMA RAVINE (1/1)

**Urban Water Supply
System Survey**

General

Name of Urban Centre : *Eldama Ravine*

Organisation/Water Undertaker : *NWCPC*

District : *Koibatek* Location: *Eldama Ravine*

Map (1/50,000) Ref. no : *104/3* Co-ordinates *X 35° 45' Y N 00° 03'*

Drainage Sub-basin : *2ED*

Existing facilities: *2 No boreholes and Chemususu river.*

Source: *Chemususu river.* Type of Intake : *Weir* Elevation : *2165m. Eldama Ravine*

Raw water system : *1.Gravity 2. Pumping* H : *m* Dia : *350mm*

Treatment Process : *Full conventional treatment of river raw water.
2 No borehole are not operational. Treatment works comprise of 1 No receiving chamber,
2 No mixing chambers ,5 No sedimentation tanks , 8 No sand filters , 1 No clear water tank - 2 No
distribution and BPT tanks. All quality control tests are done in Nakuru.
Dosage rates: Chlorine = 20kg/day, Alum 200kg/day*

Designed Capacity: *6,700m³/day*

Treated water/Distribution system

Area covered: *10 km²*

Distribution mains (80mm and above): *300 mm to 80 mm*

Total length : *22 km*

UFW (Estimated) : *m³/d*

Consumers - Total no : *600*

Metered : *480*

Unmetered : *120*

Working Meters: *Zonal meter 5 No only working*

Water production : *2,460 m³/d*

Service area population :

Population served : *20,000*

Remark : *Production calculated from intake and pumping rates.*

Financial/Revenue:

O & M costs : *Ksh*

Revenue earned : *Kshs 3,331,927*

Revenue collected : *Kshs 2,987,615*

Rehabilitation required/costs

Kshs Estimated

i) *Bore holes - improvements*

10,00,000

ii) *Distribution system - extensions.*

25,00,000

Total

35,00,000

Future development plan

Source : *Boreholes to supplement the present supply*

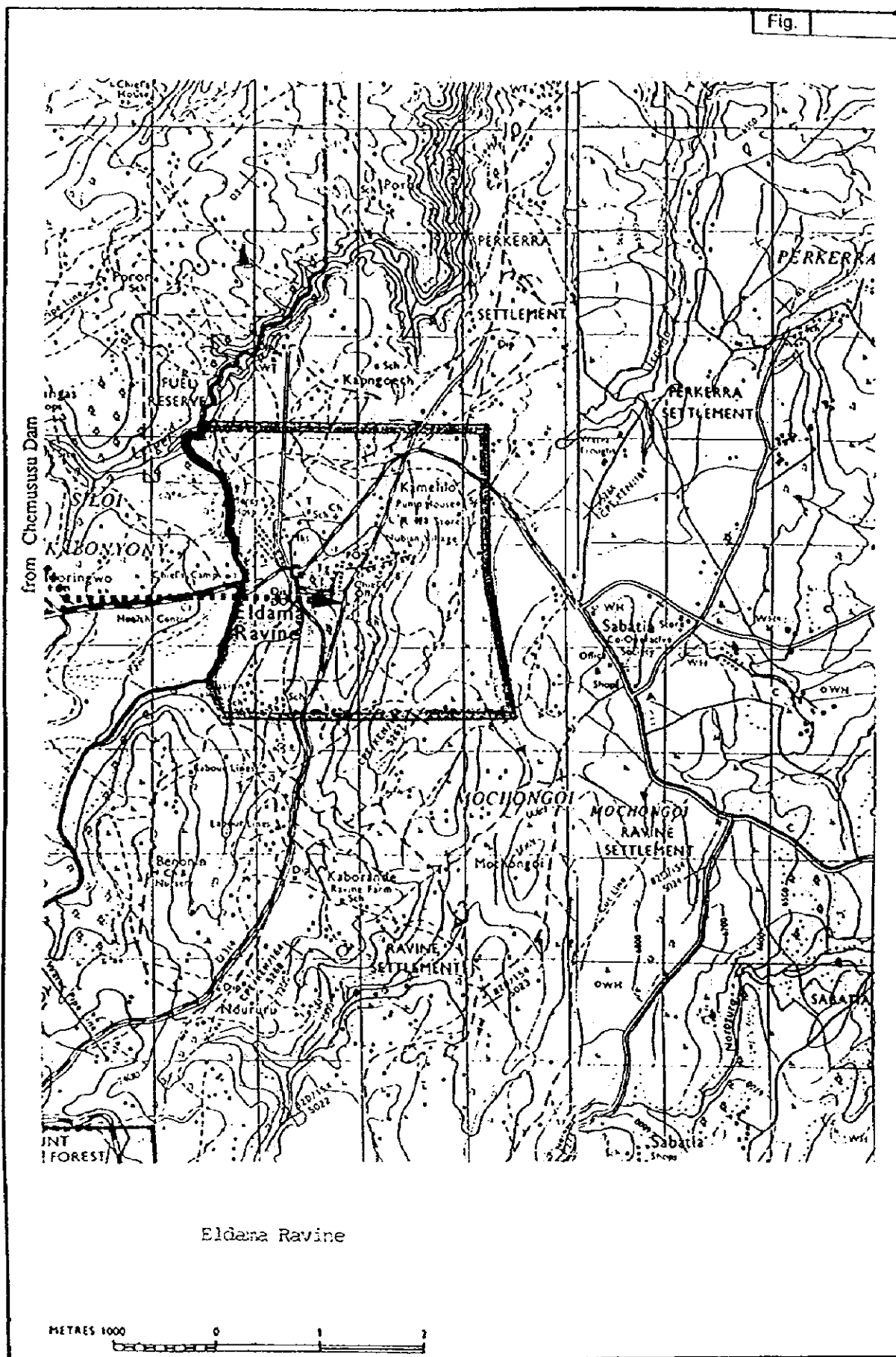
Treatment : *Chlorination* Capacity : *m³/d*

Design year :

Design population:

Remarks

The supply system is only about 10 yrs. old but does require rehabilitation and extension and improvement of distribution system. Rationing is necessary to serve the area equitably.



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MOGOTIO (1/1)

Urban Water Supply
System Survey

General

Name of Urban Centre : *Mogotio*
 Organisation/Water Undertaker : *Ministry of Water Resources*
 District : *Koibatek* Location : *Mogotio*
 Map (1/50,000) Ref. no : *118/2* Co-ordinates X : *35° 55'* Y : *N 00° 00'*
 Drainage Sub-basin : *2EG2*

Existing facilities

Source : *Molo River and Borehole* Type of Intake : *Weir* Elevation : *5,200 m*
 Raw water system : *Gravity* H : *38 m* Dia : *GI 200, uPVC 150 mm*
 Treatment Process : *No Treatment*
Water supply scheme originally meant for livestock
 Designed Capacity :
 Treated water/Distribution system - Area covered : *km²*
 Distribution mains (80mm and above): *80 mm uPVC*
 Total length : *20.3 km*

UFW (Estimated) : *m³/d*
 Consumers - Total no : *580 - 1997* Working Meters: *No meters. Flat rate charged to all connections*
 Metered : *Nil*
 Unmetered : *580 - 1997*

Water production : *m³/d* Remark : *Water production not recorded as no meter in gravity main*
 Service area population : *15,000*
 Population served : *5,000*

Financial/Revenue

O & M costs : *Kshs*
 Revenue earned : *Kshs* *Information not available*
 Revenue collected : *Kshs 274,567*

Rehabilitation required/costs

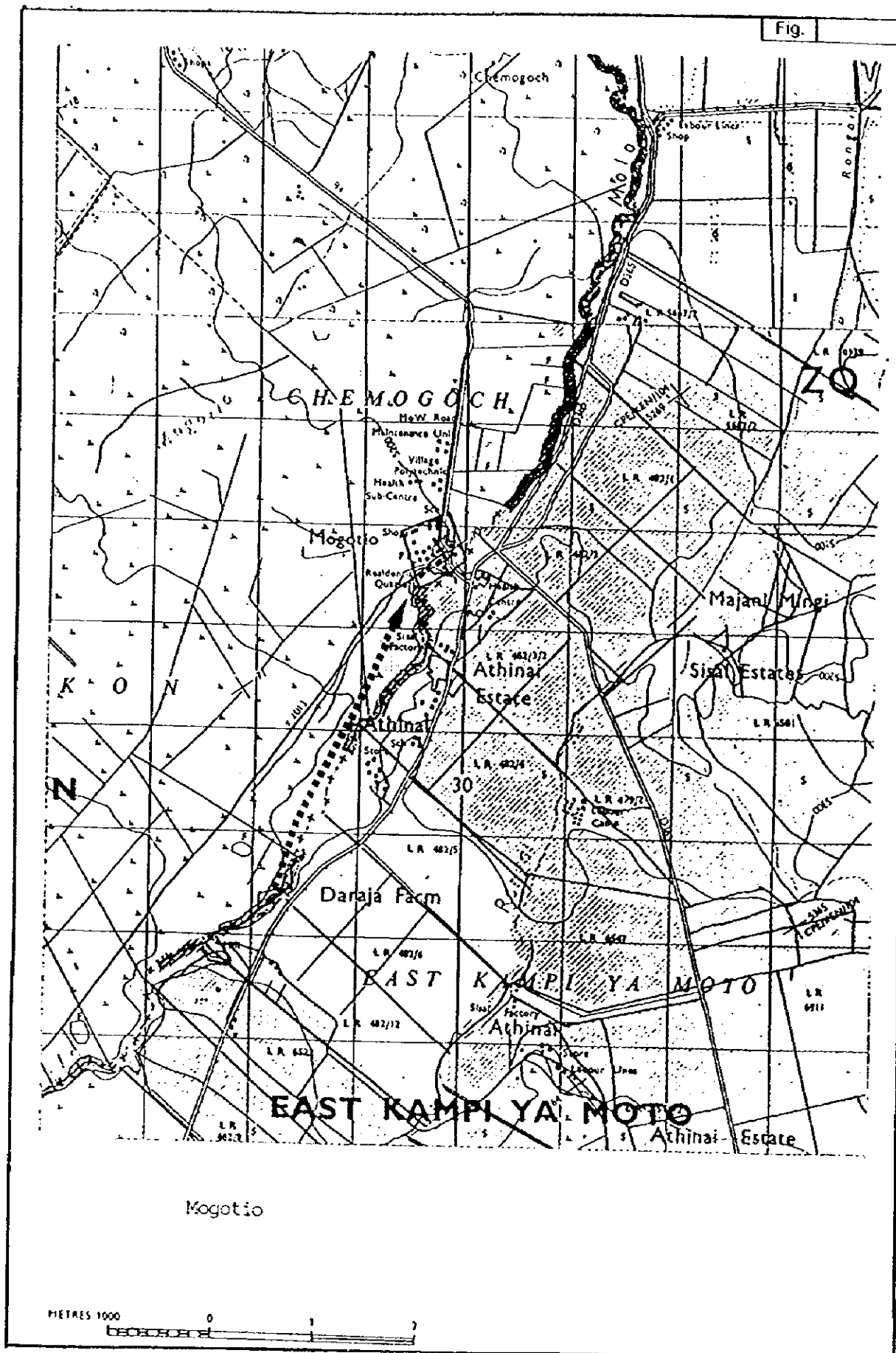
	Estimated Cost	Kshs
i) <i>Equipping of Existing Borehole including electrification</i>		<i>5,000,000</i>
ii) <i>Replacing of 150mm dia. uPVC with 200mm dia. uPVC Gravity Main</i>		<i>20,000,000</i>
iii) <i>Rehabilitation of Intake</i>		<i>1,000,000</i>
iv) <i>Construction of Composite T/Unit</i>		<i>2,000,000</i>
Total		<i>28,000,000</i>

Future development plan

Source : *Boreholes*
 Treatment : *Full Treatment* Capacity : *500 m³/d*
 Design year : *2000*
 Design population : *10,000*

Remarks

This borehole was drilled in 1948 to serve livestock. The surface water scheme was constructed in 1981 to serve only livestock. However, it now serves both human and livestock. It is therefore proposed to equip this borehole with electrical pump to augment supply, as well as construct a composite treatment unit for the gravity scheme. This is particularly urgent as the community is using very turbid river water of very poor quality. Metering to improve revenue connection will then be required and justified.



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MARIGAT (1/1)

**Urban Water Supply
System Survey**

General

Name of Urban Centre : Marigat
 Organisation/Water Undertaker : Ministry of Water Resources
 District : Baringo Location : Marigat
 Map (1/50,000) Ref. no : 104/2 Co-ordinates X : 35° 00'E Y : 00° 29'N
 Drainage Sub-basin : 2EH

Existing facilities

Source : River Perokera Type of Intake : Canal Elevation : 1035 m
 Raw water system : Pumping H : 60 m Dia : 80 G.S. mm

Treatment Process :

1 No. Mixing Chamber, 1 No. Sedimentation Basin, 1 No. Clear Water Tank/Chlorination Chamber. Dosing varies with season. The previous yearly dosage was:- Chlorine = 103 kg, Alum = 3702 kg and Soda Ash = 1890 kg.

Designed Capacity : 336 m³/day
 Treated water/Distribution system -

Area covered : km²
 Distribution mains (80mm and above): 80 mm to mm
 Total length : 4.5 km (3.5 km GI, 1km. upvc)

UFW (Estimated) : m³/d
 Consumers - Total no : 239 (1996)
 Metered :
 Unmetered : 239 (1996)

Working Meters: It seems that consumers are charged on flat rate basis.

Water production : 154 m³/d

Remark : Production availed from pumping rate of 14m³/hr.

Service area population :)
 Population served :) Information unavailable.

Financial/Revenue

O & M costs :Kshs 603,804 (1996)
 Revenue earned :Kshs)
 Revenue collected :Kshs) Information unavailable.

Rehabilitation required/costs

Kshs

- i) Not Proposed
- ii)
- iii)
- iv)
- v)
- vi)

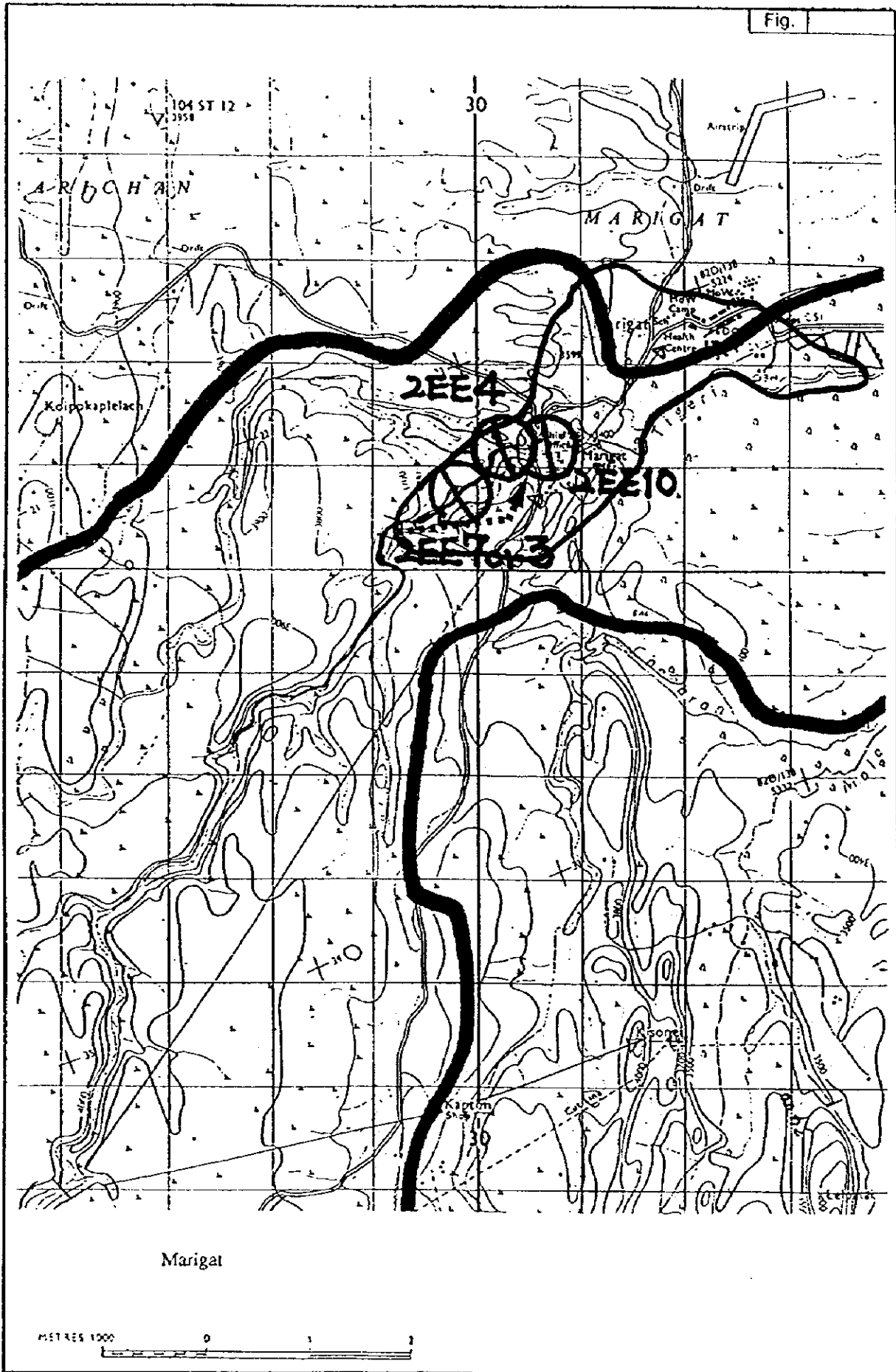
Total estimated cost

Future development plan

Source :)
 Treatment : Capacity : m³/d) New scheme proposed but
 Design year :) particulars not available.
 Design population :)

Remarks

The existing scheme was constructed by National Irrigation Board in 1956 for its staff at Perokera Irrigation Scheme. It draws raw water from Perokera River by Canal. The water is pumped by diesel-powered pumps to T/Works. The original scheme of capacity 6m³/day was expanded to 14 m³/day in 1993. At present, supply is not adequate resulting in daily rationing.



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ITEN (I/I)

**Urban Water Supply
System Survey**

General

Name of Urban Centre : *Iten*
 Organisation/Water Undertaker : *Ministry of Water Resources*
 District : *Keiyo* Location : *Iten*
 Map (1/50,000) Ref. no : *90/3* Co-ordinates X : *35° 32' E* Y : *00° 41' N*
 Drainage Sub-basin : *2CB*

Existing facilities

Source : *Kamiriny Spring and 2 No. Boreholes* Type of Intake : *Spring / Boreholes* Elevation : *2340 m AOD*
 Raw water system : *Pumping* H : *m* Dia : *80 mm PVC/GI from spring,
150 mm from Boreholes*
 Treatment Process : *Chlorine dosing only*
200 gm of chlorine is dosed in a 150m³ tank before distribution. Alum is only dosed for Kiptabus boreholes at a rate of 75kg/d.

Designed Capacity : -
 Treated water/Distribution system - Area covered : - *km²*
 Distribution mains (80mm and above): *100 mm to 150 mm*
 Total length : *3.5 km*

UFW (Estimated) : *N/A m³/d*
 Consumers - Total no : *609* Working Meters: *287 (285 metres removed due to non-payment)*
 Metered : *572*
 Unmetered : *37*

Water production : *460 m³/d - 1996* Remark :
 Service area population : *13,000 - 1996*
 Population served : *Approx. 1900*

Financial/Revenue (1996)

O & M costs : *Kshs 655,000*
 Revenue earned : *Kshs 1,064,999*
 Revenue collected : *Kshs 875,203*

Rehabilitation required/costs

	Kshs
i) <i>Construction & Equipping Laboratory</i>	<i>1,800,000</i>
ii) <i>Rehabilitation of Chebokokwa Borehole</i>	<i>500,000</i>
iii)	
iv)	
v)	
vi)	
Total estimated cost	<i>2,300,000</i>

Future development plan

Source : *Yokot Dam*
 Treatment : *Full Treatment* Capacity : *1000 m³/d*
 Design year : *1999*
 Design population : *30,000*

Remarks

The Spring Scheme was constructed in 1954. Kiptabus and Chebokokwa Boreholes were constructed in 1976 to augment the Kamiriny Spring Supply. Presently, Chebokokwa borehole is inoperational as it is under rehabilitation. The existing sources have a potential of 600 m³/day and if fully exploited, the served area can be extended. Though chlorine is being dosed, full treatment is recommended.

General

Name of Urban Centre : *Tambach*
 Organisation/Water Undertaker : *Ministry of Water Resources*
 District : *Keijo* Location : *Tambach*
 Map (1/50,000) Ref. no : *90/3* Co-ordinates X : *35° 31'* Y : *N00° 36'*
 Drainage Sub-basin : *2CB*

Existing facilities

Source : *Spring* Type of Intake : *Spring* Elevation : *2000 m AOD*
 Raw water system : *Pumping* H : *m* Dia : *50 mm*
 Treatment Process : *Chlorine dosing only*

Designed Capacity : - *300 m³/day*
 Treated water/Distribution system - Area covered : - *km²*
 Distribution mains (80mm and above): - *mm to -mm*
 Total length : - *km (Max 50 mm)*

UFW (Estimated) : *5%*
 Consumers - Total no : *90 - 1996* Working Meters: *Info. unavailable*
 Metered : *50 - 1996*
 Unmetered : *40 - 1996*

Water production : *97.3 m³/d - 1996* Remark :

Service area population : *Information unavailable*

Population served : *Information unavailable*

Financial/Revenue 1996/1997

O & M costs : *Kshs 315,520 - excluding salaries as information on this was not available.*

Revenue earned : *Kshs 209,884 - 1996*

Revenue collected : *Kshs 109,401 - 1996*

Rehabilitation required/costs

Kshs

i) *See Remarks*

ii)

iii)

iv)

v)

vi)

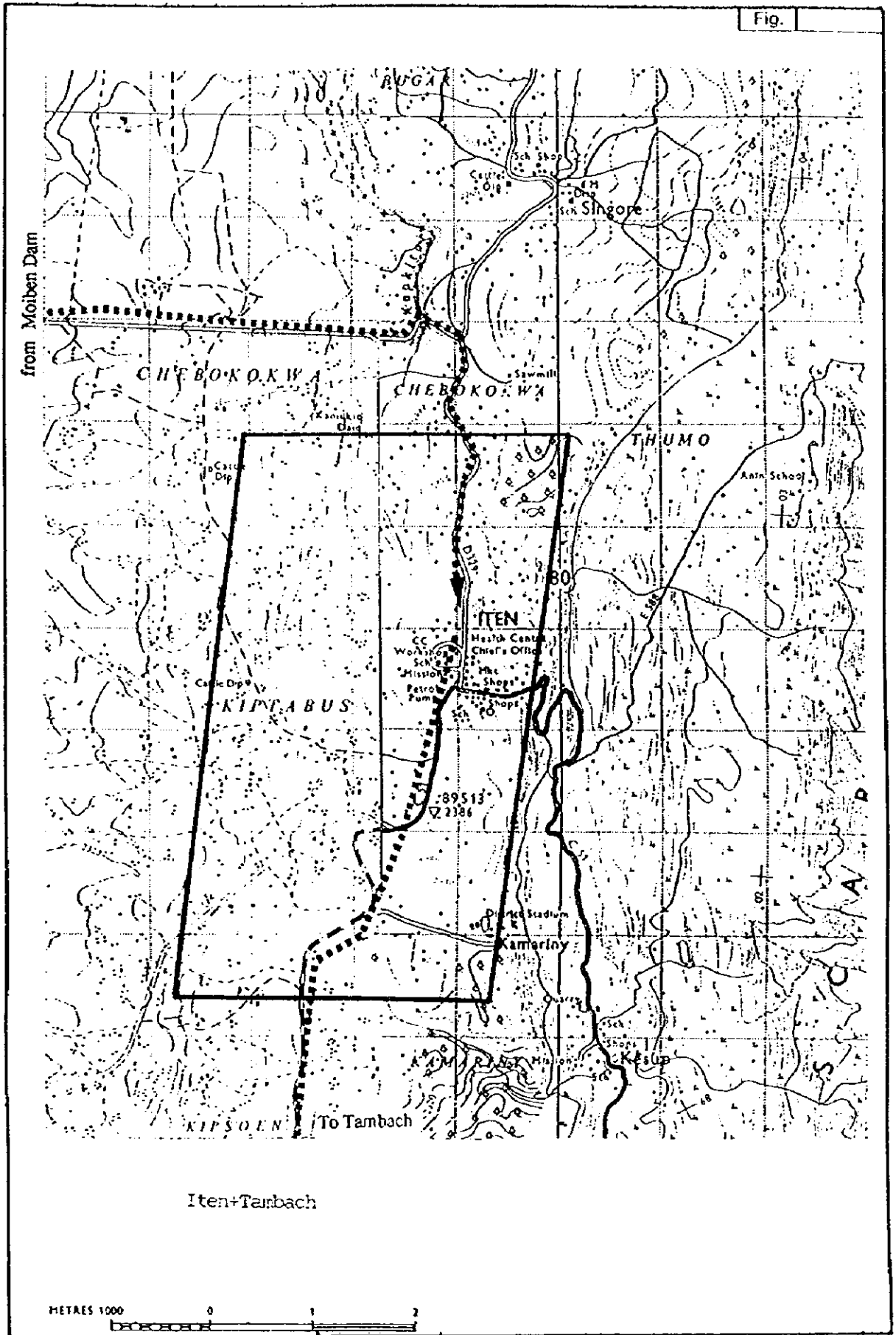
Total estimated cost

Future development plan

Source : *Spring*
 Treatment : *Full Treatment* Capacity : *1000 m³/d*
 Design year : *2010*
 Design population : *15,000*

Remarks

Scheme completed in 1958 when reticulation lines were laid. There is no treatment works - this is included in the proposal for future development alongside expansion of spring source, the cost for which is estimated K.Shs.25,500,000.



GeneralName of Urban Centre : *Nandi Hills*Organisation/Water Undertaker : *Ministry of Water Resources*District : *Nandi* Location : *Chemelil*Map (1/50,000) Ref. no : *103/3* Co-ordinates X : *35° 12'* Y : *N 00° 07'*Drainage Sub-basin : *1FD***Existing facilities**Source : *Taito River* Type of Intake : *Weir* Elevation : *m*Raw water system : *Gravity* H : *20 m* Dia : *100 mm*

Treatment Process :

There is an existing treatment works which has been abandoned. Only chlorine and Soda Ash dosing is carried out at the clear water tank/sump, dosage being 0.8 kg/d and 3.0 kg/d respectively

Designed Capacity :

Treated water/Distribution system -

Area covered : *2.0 km²*Distribution mains (80mm and above): *80mm uPVC*Total length : *1.5 km*UFW (Estimated) : *m³/d*Consumers - Total no : *150*

Metered :

Unmetered :

Working Meters:

Water production :

Remark :

Service area population :

Population served :

Financial/Revenue

O & M costs :Kshs

Revenue earned :Kshs

Revenue collected :Kshs

Rehabilitation required/costs

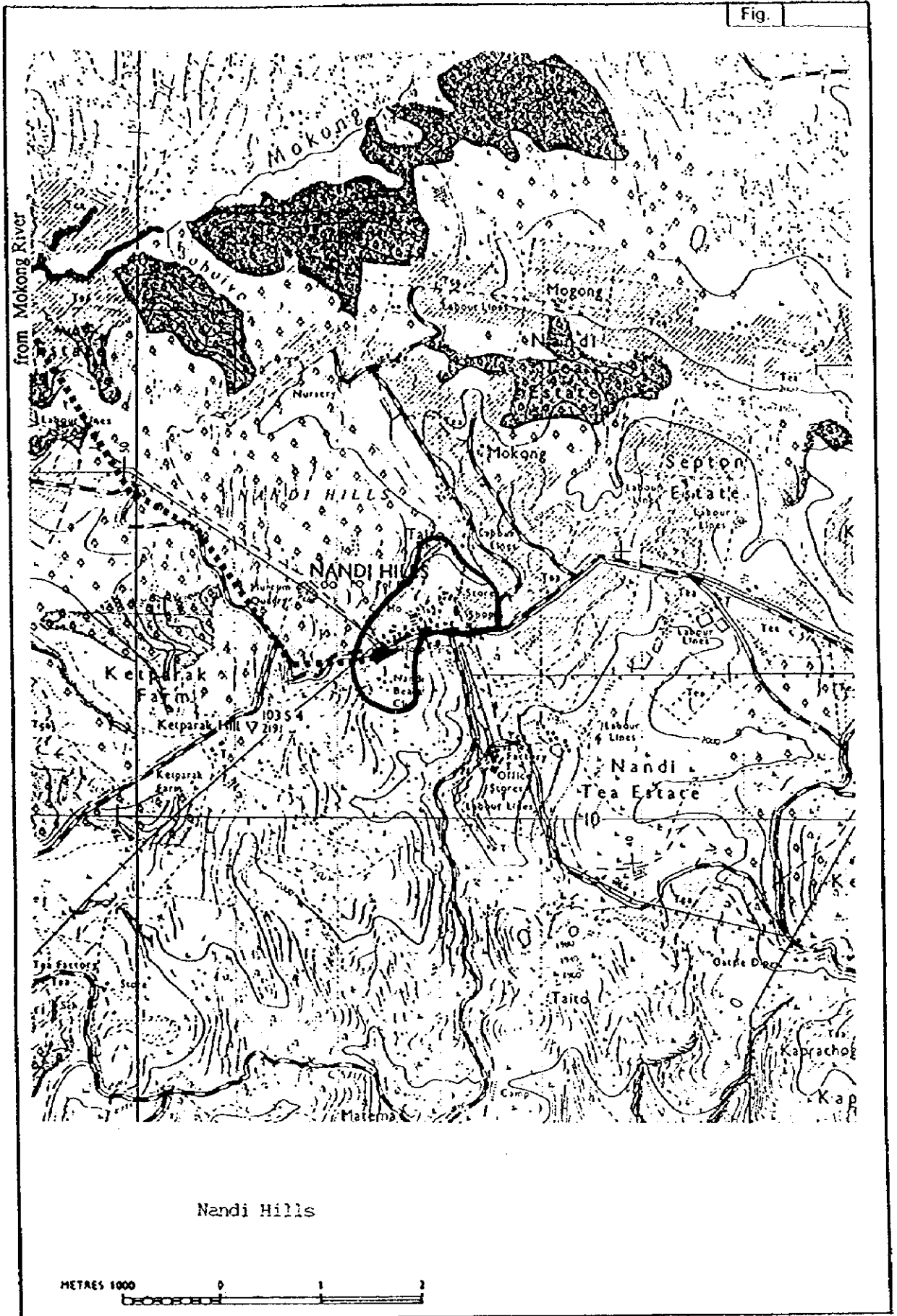
Estimated Cost

Kshs

i) *Rehabilitation of existing treatment works and installation of dosing equipment* 1,500,000ii) *Augmentation of rising main and distribution mains - approx. length 4,500m* 3,800,000iii) *Rehabilitation of intake weir* 160,000iv) *Installation of 2 No. treated water pumps* 1,000,000

Total 6,460,000

Future development planSource : *River Taito*Treatment : *Full Conventional* Capacity : *5,000 m³/d*Design year : *2022*Design population : *20,000***Remarks***Nandi Hills water supply was constructed in 1940's and comprises of an intake weir and a full conventional treatment works which has been abandoned. At present water gravitates from the intake to a clear water tank/sump from where chlorine and Soda Ash is dosed. From the sump, water is pumped to storage reservoirs for distribution*



General

Name of Urban Centre : *Kapsabet*
Organisation/Water Undertaker : *National Water Conservation & Pipeline Corporation*
District : *Nandi* Location : *8322 Chemundu*
Map (1/50,000) Ref. no : *103/3* Co-ordinates X : *35° 08'* Y : *N 00° 13'*
Drainage Sub-basin : *1FC*

Existing facilities

Source : *Kabutie River* Type of Intake : *Weir* Elevation : *m*
Raw water system : *Gravity* H : *m* Dia : *150 mm*
Treatment Process :

Full Conventional Treatment, Coagulation, Sedimentation, Filtration, Disinfection/Chlorination. Dosing using FRO dosers at rates of - Chlorine = 5 kg/d, Alum = 50 kg/d and Soda Ash = 10 kg/d

Designed Capacity : *624 m³/d*
Treated water/Distribution system - Area covered : *3.0 km²*
Distribution mains (80mm and above): *80 mm to 100 mm*
Total length : *9.1 km*

UFW (Estimated) :
Consumers - Total no : *1030* Working Meters: *Data not available*
Metered : *840*
Unmetered : *190*

Water production : *1100 m³/d* Remark :
Service area population : *20,000*
Population served : *7,000*

Financial/Revenue

O & M costs :Kshs *Details not available*
Revenue earned :Kshs *2,425,912*
Revenue collected :Kshs *2,188,049*

Rehabilitation required/costs

	Estimated Cost	Kshs
i) <i>Rehabilitation of raw water main and treatment works</i>		<i>2,018,525</i>
ii) <i>Repairing 1 No. pumping unit</i>		<i>500,000</i>
iii) <i>Supply of laboratory equipment</i>		<i>40,000</i>
iv) <i>Rehabilitation of staff houses</i>		<i>60,000</i>
	Total	<i>2,618,525</i>

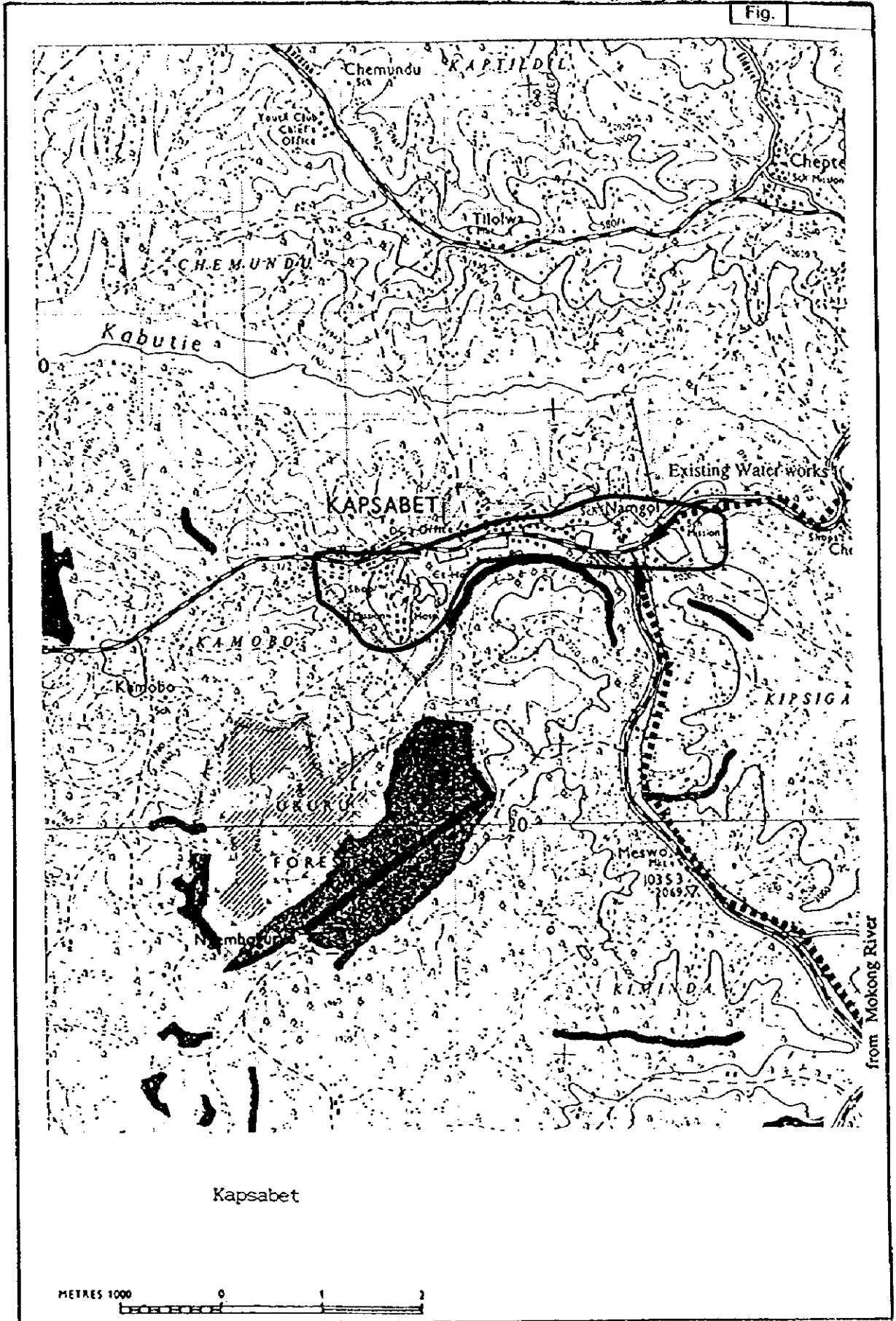
Future development plan

Source : *Kimondi River*
Treatment : Capacity : *m³/d*)
Design year :) *Details not available*
Design population :)

Remarks

The Kapsabet water supply is not adequate to meet the demand of the growing Urban population.

Note: The Scheme Manager clarified that Baraton Water Supply is an Institutional Supply. In this respect Summary Sheet for Baraton Water Supply is under Rural Water Supply Schemes Summary Sheets.



General

Name of Urban Centre : *Maralal*
Organisation/Water Undertaker : *Ministry of Water Resources*
District : *Samburu* Location : *Maralal*
Map (1/50,000) Ref. no : *78/3* Co-ordinates X : *35° 41'* Y: *01° 05' N*
Drainage Sub-basin :

Existing facilities

Source : *Nundoto Earth Dam (Storage capacity 230,000 m³)* Type of Intake : Elevation : *1940 m*
Raw water system : *Pumping* H: *m* Dia : *150 mm*
Treatment Process :

Full Conventional Treatment - Coagulation, Sedimentation, Filtration, Disinfection/Chlorination. Dosage Rates:- TCL = 12 kg/d, Alum = 50 kg/d, Soda Ash = 30 kg/d. Whilst TCL and Soda Ash are dosed using FRO doser, Alum solution is pumped.

Designed Capacity : *m³/d*

Treated water/Distribution system - Area covered : *6.0 km²*
Distribution mains (80mm and above): *100 mm to 200 mm*
Total length : *km*

UFW (Estimated) : *m³/d*

Consumers - Total no : *426* Working Meters:
Metered : *415*
Unmetered : *11*

Water production : *529 m³/d*

Remark :

Service area population : *23,053*

Population served : *Details not available*

Financial/Revenue - 1996/97

O & M costs :Kshs *1,522,909*

Revenue earned :Kshs *2,177,107*

Revenue collected :Kshs *1,652,038*

Rehabilitation required/costs - N/A

Estimated Cost	Kshs
i) <i>Chemical solution pump replacement</i>	<i>100,000</i>
ii)	
iii)	
iv)	
v)	
Total	<i>100,000</i>

Future development plan - N/A

Source : *Construction of another dam*

Treatment : *Full Conventional* Capacity : *2,000 m³/d*

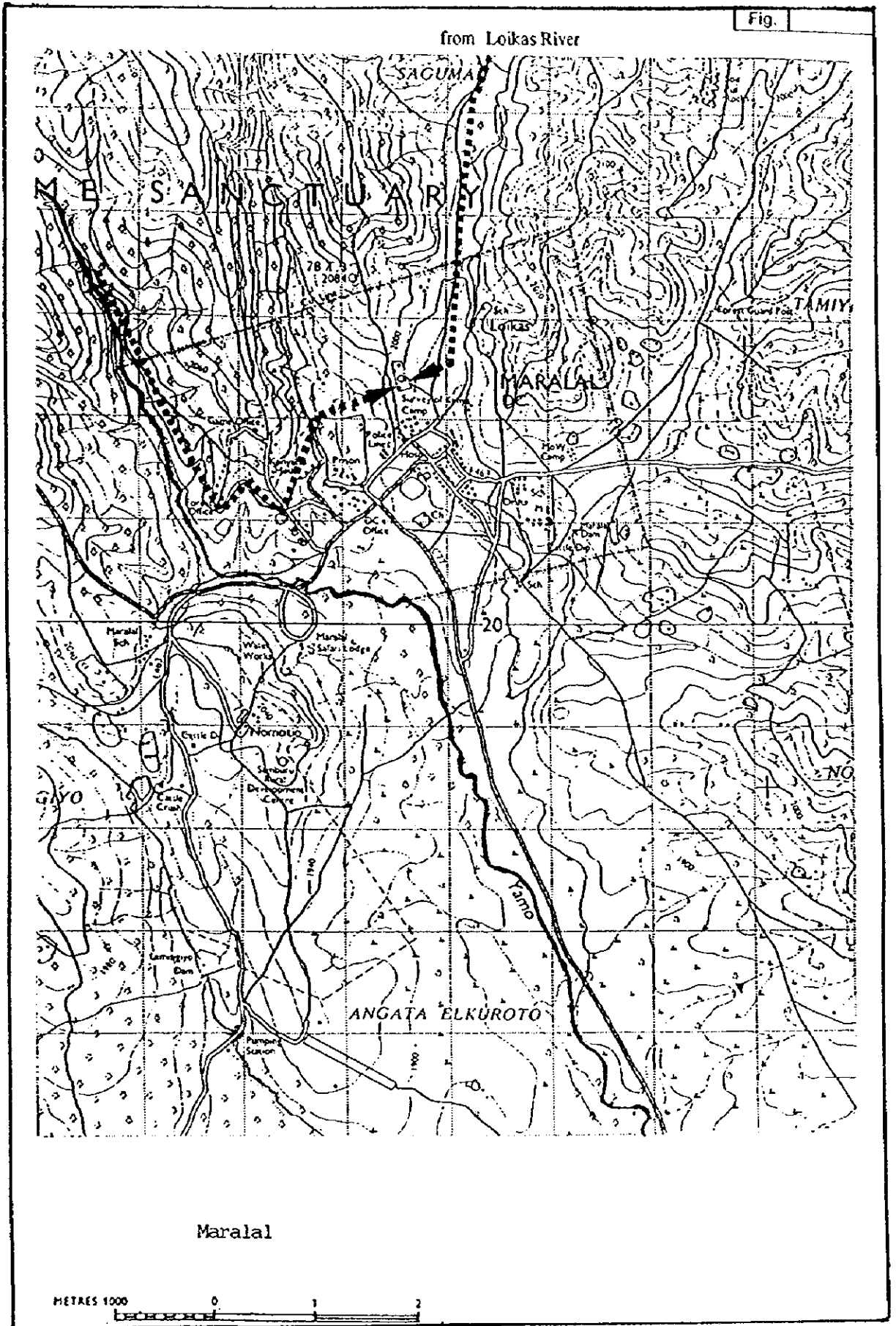
Design year : *2020*

Design population : *50,000*

Remarks

The existing scheme is the 1st phase, completed in 1985. The 2nd phase is yet to be implemented and comprises of:-

- i) Expansion of treatment works*
- ii) Dredging and expansion of existing dam*
- iii) Provision of 850 m³ storage tank*



General

Name of Urban Centre : *Wamba*

Organisation/Water Undertaker : *Ministry of Water Resources*

District : *Samburu* Location : *Wamba*

Map (1/50,000) Ref. no : *93/2*

Co-ordinates X : *37° 19' E* Y : *00° 59' N*

Drainage Sub-basin :

Existing facilities

Source : *Spring and 1 No. Borehole*

Type of Intake :

Elevation : m

Raw water system : *Gravity / Pumping*

H : m Dia : *50 mm*

Treatment Process :

No treatment to borehole water and chlorination for spring water only

Designed Capacity : *m³/d*

Treated water/Distribution system -

Area covered : *1.0 km²*

Distribution mains (80mm and above): mm to mm

Total length : *km - Details not available*

UFW (Estimated) : *m³/d*

Consumers - Total no : *126*

Working Meters:

Metered : *Nil*

Unmetered : *126*

Water production : *m³/d*)

Remark :

Service area population :)

Population served :) *Details not available*

Financial/Revenue)

O & M costs :Kshs)

Revenue earned :Kshs)

Revenue collected :Kshs)

Rehabilitation required/costs - *N/A*

Estimated Cost Kshs

i)

ii)

iii)

Total

Future development plan - *N/A*

Source :

Treatment : Capacity : *m³/d*

Design year :

Design population :

Remarks

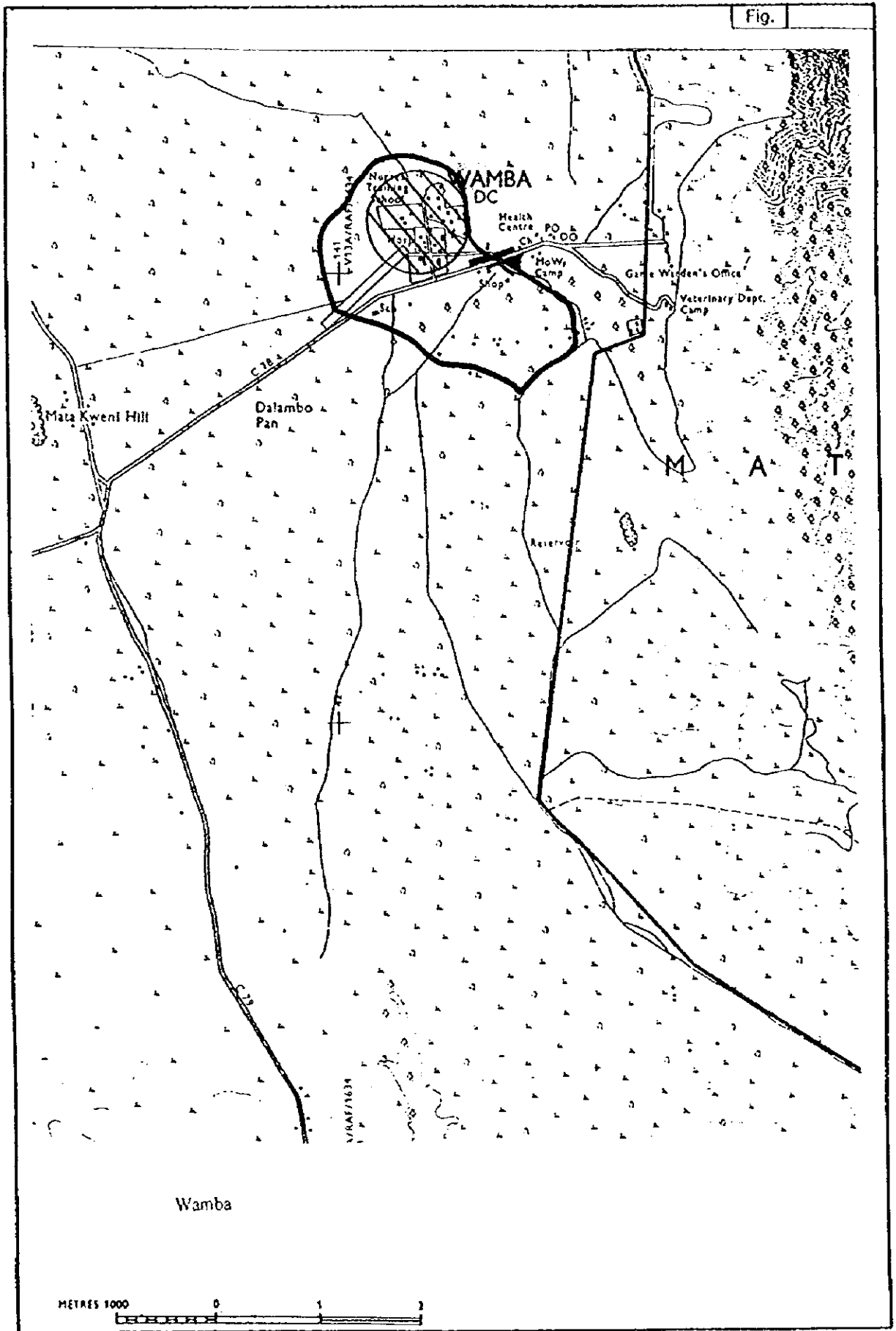
The present water supply system comprises of two schemes/sources which use spring water and ground water.

The spring source was constructed between 1987 and 1990, while the boreholes were drilled in 1978 and equipped in 1979.

The spring scheme is a gravity scheme serving majority of the consumers. 4 No. reservoirs with a total capacity of 245 m³ form a part of the distribution network.

The borehole primarily serves the Hospital which is also supplemented by the spring scheme since the borehole yield is only 1.5 m³/hr.

Shortfall of supply is felt during the dry season and rationing effected.



General

Name of Urban Centre : Baragoi

Organisation/Water Undertaker : Ministry of Water Resources

District : Samburu Location : Elbarta

Map (1/50,000) Ref. no : 65/2

Co-ordinates X : 36° 47' E Y: 01° 47' N

Drainage Sub-basin : 2D

Existing facilities

Source : 2 No Boreholes

Type of Intake :

Elevation : m

Raw water system :

H: m Dia : 50 mm

Treatment Process :

No treatment done

Designed Capacity : m³/d

Treated water/Distribution system -

Area covered : 1.0 km²

Distribution mains (80mm and above): mm to mm

Total length : km - Distribution mains less than 50mm

UFW (Estimated) : m³/d

Consumers - Total no : 63

Working Meters:

Metered :

Unmetered :

Water production : 15 m³/d

Remark : There are 63 No. connections and

Service area population :

2 No. communal water points

Population served :

(kiosks)

Financial/Revenue

O & M costs :Kshs)

Revenue earned :Kshs) Details not available

Revenue collected :Kshs)

Rehabilitation required/costs - N/A

Estimated Cost Kshs

i) Installation of 1 No. submersible pump and accessories for borehole No. C-3855 1,500,000

ii) Replacement of 1 No. air valve 25,000

iii)

iv)

v)

Total 1,525,000

Future development plan

Source : Earth Dam

Treatment : Full Conventional Capacity : 1000 m³/d

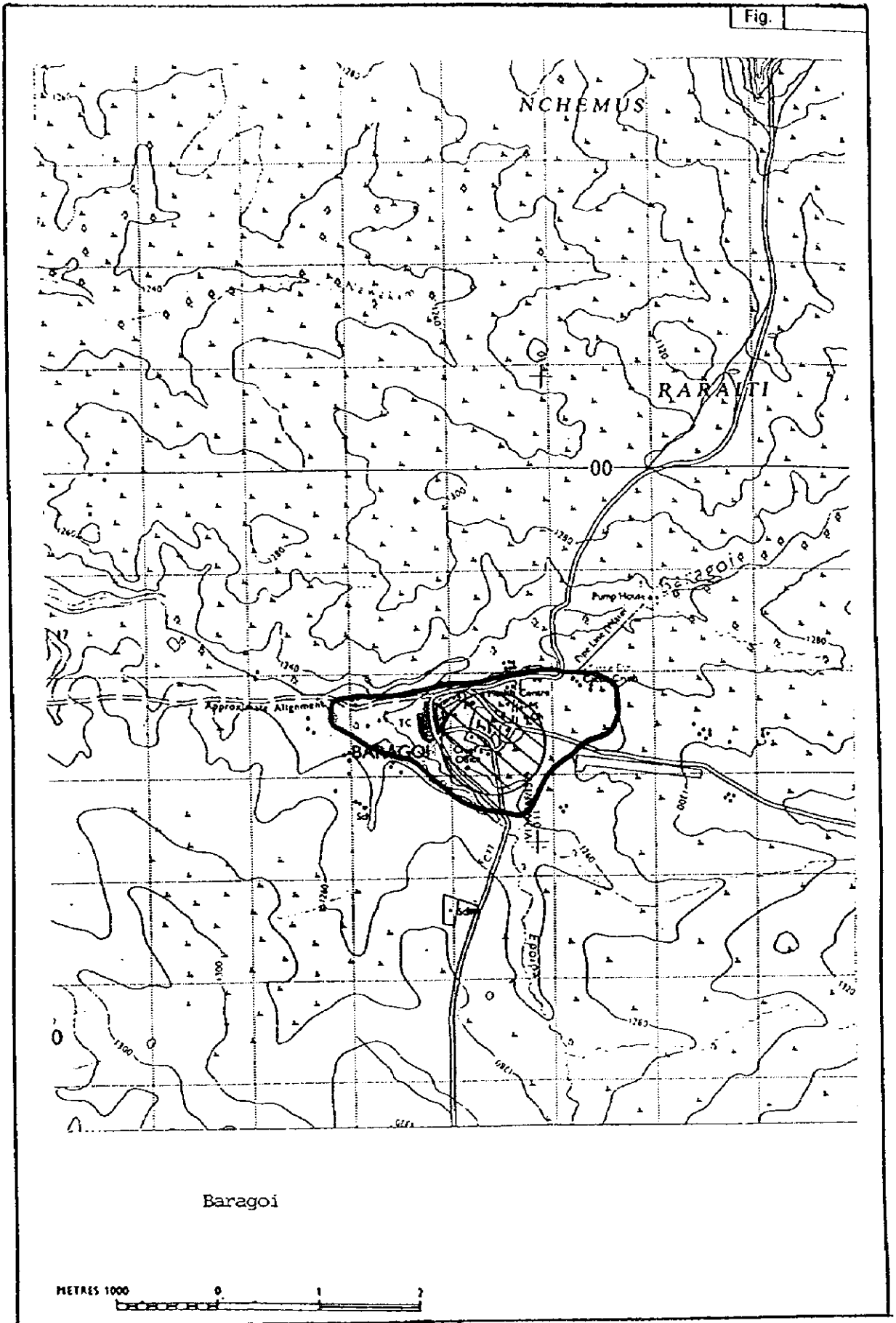
Design year : 2010

Design population : 20,000

Remarks

The present water supply system is run and managed by the local community. The District Water Engineer (DWE) only assists the community on technical matters. According to the DWE there is need to train the community in the area of operation and maintenance to effectively manage the scheme.

Borehole water is pumped to a ground level tank from where it gravitates to the consumers.



General

Name of Urban Centre : Lodwar
 Organisation/Water Undertaker : Ministry of Water Resources
 District : Turkana Location : Lodwar
 Map (1/250,000) Ref. no : NA-36-4 Co-ordinates X : 35° 32' Y : 003° 08'
 Drainage Sub-basin : 2BD

Existing facilities

Source : Boreholes 3 Nos. Type of Intake : Elevation : 1790 m AOD
 Raw water system : Pumping H : 60 m Dia : 150 mm
 Treatment Process : No Treatment
 Only Chlorination is done at a rate of 2kg/d, using a positive displacement doser.

Designed Capacity : -

Treated water/Distribution system - Area covered : 3.0 km²
 Distribution mains (80mm and above): 80 mm to 225 mm
 Total length : 19.1 km

UFW (Estimated) : - m³/d

Consumers - Total no : 1677 Working Meters: Info. unavailable
 Metered : 1652
 Unmetered : 25

Water production : 1506 m³/d

Remark :

Service area population : 40,000

Population served : 30,000

Financial/Revenue 1996-1997

O & M costs :Kshs 430,000

Revenue earned :Kshs 3,477,266

Revenue collected :Kshs 2,681,626

Rehabilitation required/costs

Kshs

i) Repair of 1 No. Storage Tank including external and Internal Plastering & Fencing	130,000
ii) Augmentation of Rising Main	6,800,000
iii) River Bank Protection (see Remarks)	3,072,000
iv) Augmentation of Distribution System Approximate Length 3200 m.	2,445,276
v)	
vi)	
Total estimated cost	12,447,276

Future development plan

Source : Additional 2No. Boreholes

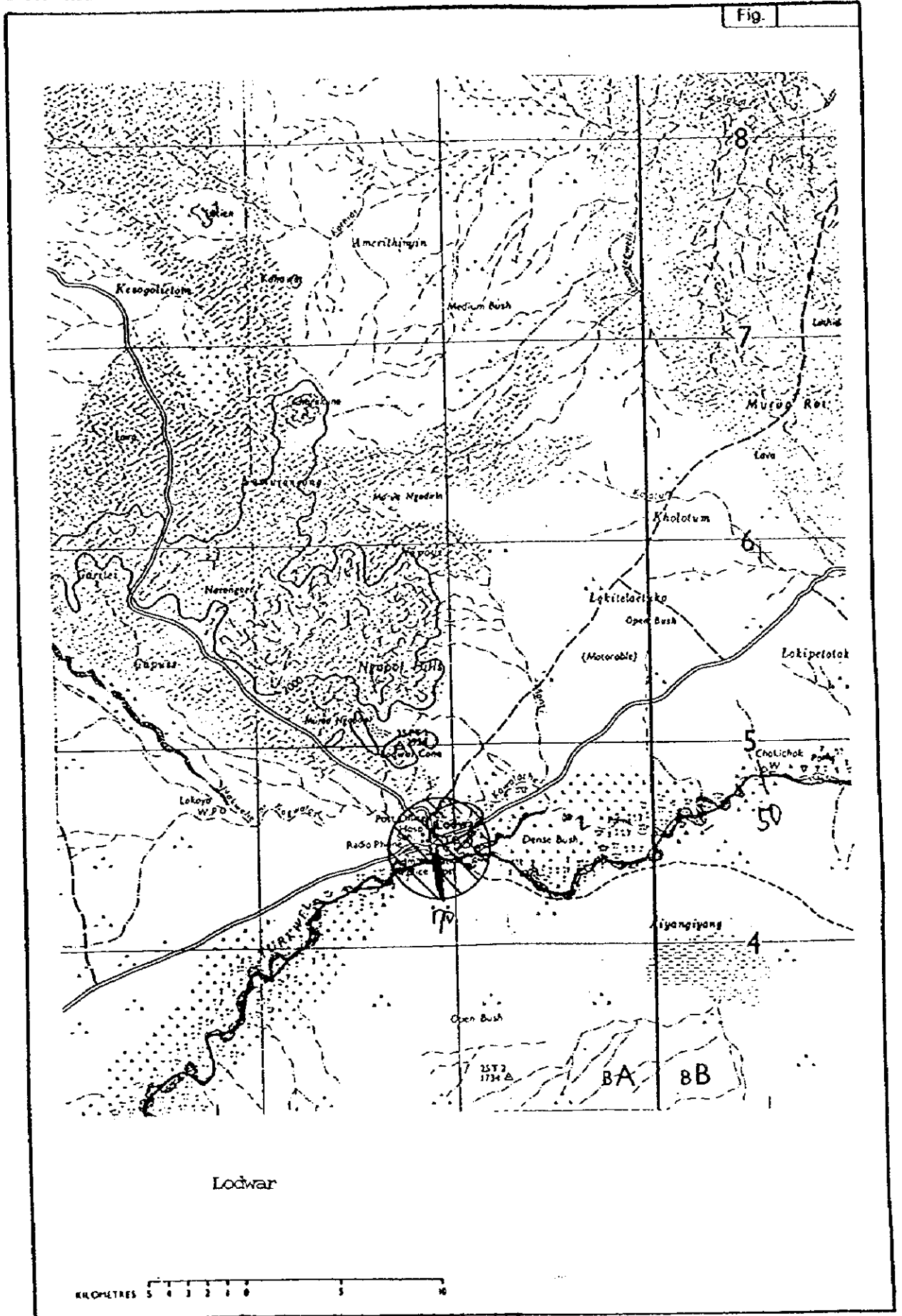
Treatment : Chlorination Capacity : 2500 m³/d

Design year : 1998

Design population : 35,000

Remarks

The Lodwar Water Supply System has been adversely affected by the recent heavy rains. Section of Turkwell River Adjacent to the major boreholes has been badly eroded threatening to wash away the pumping equipment, sections of the Distribution Mains has been washed away. The reticulation system was undertaken by NORAD and subsequent extensions carried out by Ministry of Water Resources. To command high area of supply, MOWR operates 13 No. water kiosks. High levels of contamination is recorded largely resulting from people using leaked water which forms pools. Water from these pools infiltrates back into network.



General

Name of Urban Centre : Kapenguria
Organisation/Water Undertaker : Ministry of Water Resources
District : West Pokot Location : Kapenguria
Map (1/50,000) Ref. no : 75/3 Co-ordinates X : 35° 07' E Y : 01° 16' N
Drainage Sub-basin : 2BC

Existing facilities

Source : Kapolet River Type of Intake : (sump) Elevation : 1950 m
Raw water system : Pumping 25m³/hr H : 85 m Dia : 100 mm
Treatment Process : Full Conventional Treatment
comprising of Coagulation/Flocculation, Sedimentation, Filtration and Disinfection. Dosage rates: Chlorine - 1kg/day and Alum 20kg/day.

Designed Capacity : 15 m³/hr. Area covered : 2 km²
Treated water/Distribution system - Distribution mains (80mm and above): 80 mm to 100 mm
Total length : 4.8 km

UFW (Estimated) : m³/d Working Meters:
Consumers - Total no : 557
Metered : 21
Unmetered : 536

Water production : 247 m³/d Remark :
Service area population : 6,500
Population served : 5,500

Financial/Revenue

O & M costs :Kshs 250,000 (1996)
Revenue earned :Kshs 802,487
Revenue collected :Kshs 526,817

Rehabilitation required/costs

	Kshs
i) Pumping Units - complete	500,000
ii) Replacement of a section of pipeline	1,500,000
iii)	
iv)	
v)	
vi)	
Total estimated cost	2,000,000

Future development plan

Source :
Treatment : Capacity : m³/d
Design year :
Design population :

Remarks

This scheme was constructed in early 1950s and since then no expansion has taken place. The pumping units have aged and frequent breakdowns and reduced efficiency is noted. Also, dirty water at consumers' taps has been reported.

Kapolet River is considered to be sufficient for future expansion, but as of date, no plans have been formulated.

**Aftercare Study on
the National Water Master Plan**

MAKUTANO (1/1)

**Urban Water Supply
System Survey**

General

Name of Urban Centre : Makutano
 Organisation/Water Undertaker : Ministry of Water Resources
 District : West Pokot Location : Kapenguria
 Map (1/50,000) Ref. no : 75/3 Co-ordinates X : 35° 07' E Y : 01° 16' N
 Drainage Sub-basin : 2BC

Existing facilities

Source : River (Kapenguria stream) Type of Intake : Weir Elevation : 1960 m
 Raw water system : Pumping @ 30 m³/hr H : 20 m Dia : 100 + 150 mm
 Treatment Process : Full Treatment
 Comprising of Coagulation, Flocculation, Sedimentation, Filtration and Chlorination. Dosage rates: Chlorine - 2kg/day, Alum 20kg/day, Soda Ash 6kg/day on daily basis.

Designed Capacity : 432 m³/d
 Treated water/Distribution system - Area covered : 41 km²
 Distribution mains (80mm and above): 100 mm to 100 mm
 Total length : 1.2 km

UFW (Estimated) : m³/d
 Consumers - Total no : 456 (1996) Working Meters:
 Metered : 107
 Unmetered : 349

Water production : 262 m³/d Remark :
 Service area population : 6,500
 Population served : 5,200

Financial/Revenue

O & M costs :Kshs 320,000 (1996)
 Revenue earned :Kshs 648,321 (1996)
 Revenue collected :Kshs 217,421 (1996)

Rehabilitation required/costs

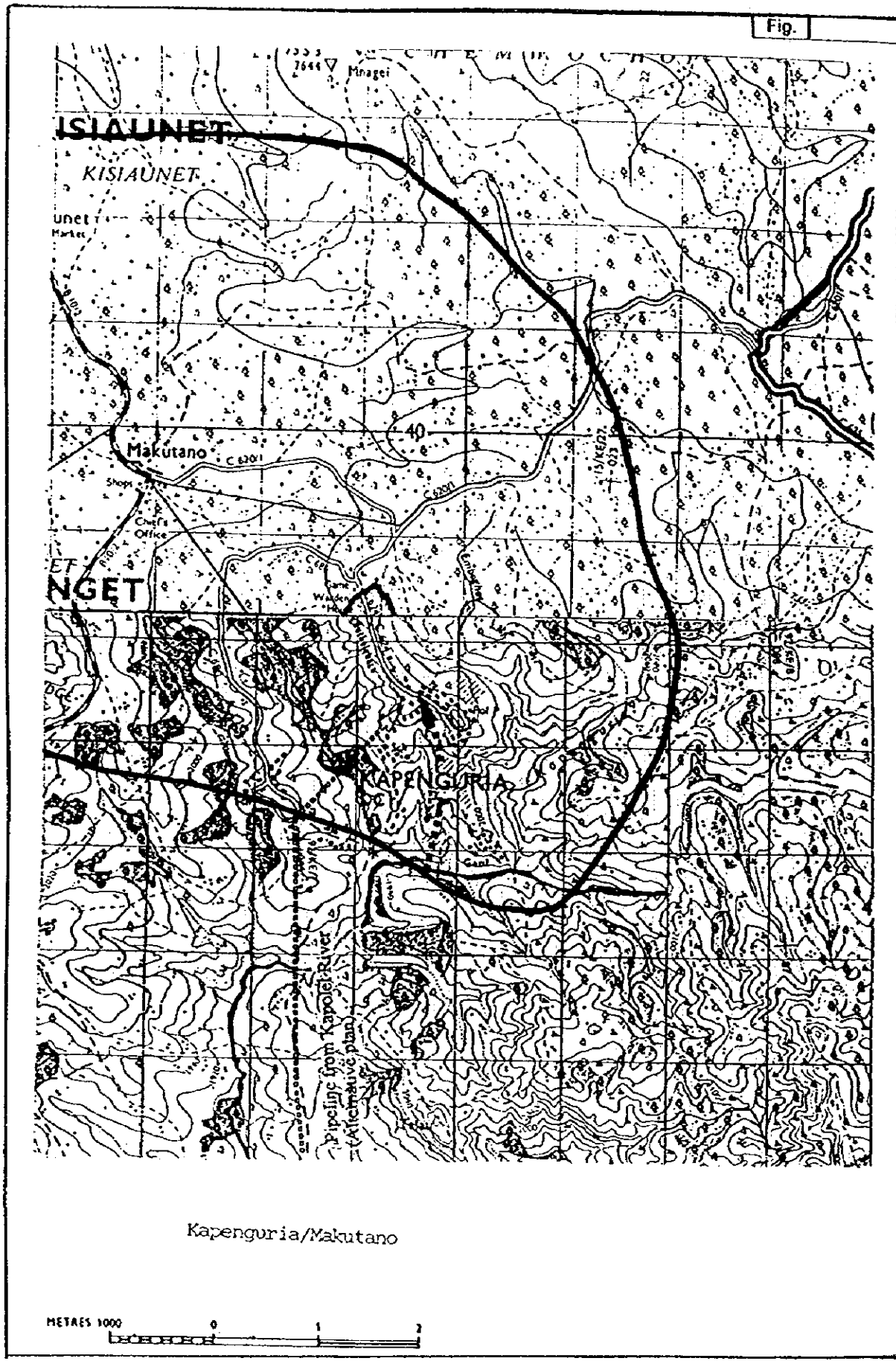
	Kshs
i) Complete Pumping Unit	500,000
ii) Replacement of section of distribution network	1,500,000
iii)	
iv)	
v)	
vi)	
Total estimated cost	2,000,000

Future development plan

Source : Sivoi River
 Treatment : Full treatment Capacity : 5,720 m³/d
 Design year : 2015
 Design population : 10,000

Remarks

This river intake system was constructed in 1972 and is currently unable to serve the demand. Pumps are aged and their efficiency reduced.



**Aftercare Study on
the National Water Plan**

MALAKISI (1/1)

**Urban Water Supply
System Survey**

General

Name of Urban Centre : *Malakisi*

Organisation/Water Undertaker : *Ministry of Water Resources*

District : *Bungoma* Location : *Malakisi*

Map (1/50,000) Ref. no : *87/4*

Co-ordinates X : *34° 27' E* Y : *00° 42' N*

Drainage Sub-basin : *1AB*

Existing facilities

Source : *River*

Type of Intake : *Weir*

Elevation : *1380 m*

Raw water system : *Gravity*

H : *50 m* Dia : *150/100 mm*

Treatment Process :

Full Conventional Treatment. Dosage Rates:- Chlorine = 6 kg/d, Alum = 120 kg/d

Designed Capacity : *100 m³/hr*

Treated water/Distribution system -

Area covered : *45 km²*

Distribution mains (80mm and above): *100 mm to 150 mm*

Total length : *km*

UFW (Estimated) : *m³/d*

Consumers - Total no : *900*

Working Meters:

Metered : *500*

Unmetered : *400*

Water production : *m³/d*

Remark :

Service area population :

Population served :

Financial/Revenue

O & M costs :Kshs

Revenue earned :Kshs

Revenue collected :Kshs

Rehabilitation required/costs

Estimated Cost

Kshs

i)

ii)

iii)

iv)

v)

Total

Future development plan

Source :

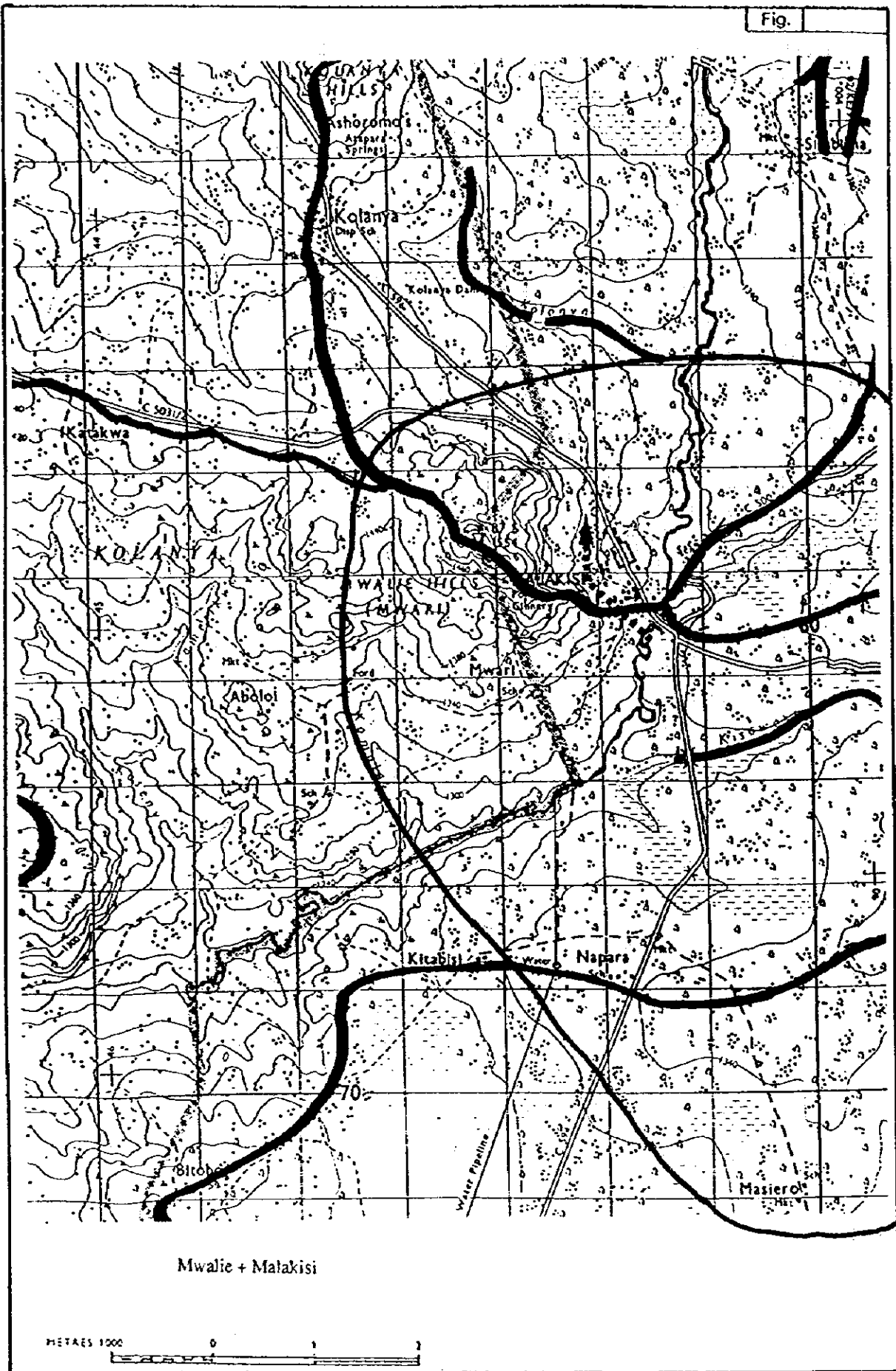
Treatment : Capacity : *m³/d*

Design year :

Design population :

Remarks

Operation and maintenance require to be strengthened and all consumers metered. Records on water production and finance are not available / kept.



**Aftercare Study on
the National Water Plan**

BUNGOMA (1/1)

**Urban Water Supply
System Survey**

General

Name of Urban Centre : *Bungoma*

Organisation/Water Undertaker : *National Water Conservation & Pipeline Corporation*

District : *Bungoma* Location : *Musinoma*

Map (1/50,000) Ref. no : *88/3*

Co-ordinates X : *34° 34' E* Y : *00° 35' N*

Drainage Sub-basin : *14G*

Existing facilities

Source : *Kuywa River and 6 No. boreholes but only 3 No. boreholes are being used at present as other 3 No. are not equipped*

Raw water system : *Pumping*

Type of Intake : *Sump*

Elevation : *m*

Treatment Process :

H : *25 m* Dia : *250 mm*

Full Conventional Treatment - Dosing carried out using pumps

Designed Capacity : *3000 m³/d*

Treated water/Distribution system -

Area covered : *km²*

Distribution mains (80mm and above): *80 mm to 250 mm*

Total length : *34 km*

UFW (Estimated) : *50% m³/d*

Consumers - Total no : *3035 (1997)*

Working Meters *283 (approx. 10%)*

Metered : *2830*

Unmetered : *205*

Water production : *2620 m³/d*

Remark :

Service area population : *57,600*

Population served : *36,000*

Financial/Revenue

O & M costs : *Kshs*

Revenue earned : *Kshs*

Revenue collected : *Kshs 3,244,358*

Rehabilitation required/costs

Estimated Cost

Kshs

i) *Intake and treatment works*

55,000,000

ii) *Transmission main*

320,000,000

iii) *Staff housing*

8,000,000

iv) *Storage*

50,000,000

v) *Distribution network*

200,000,000

Total

633,000,000

Future development plan

Source : *Kuywa River*

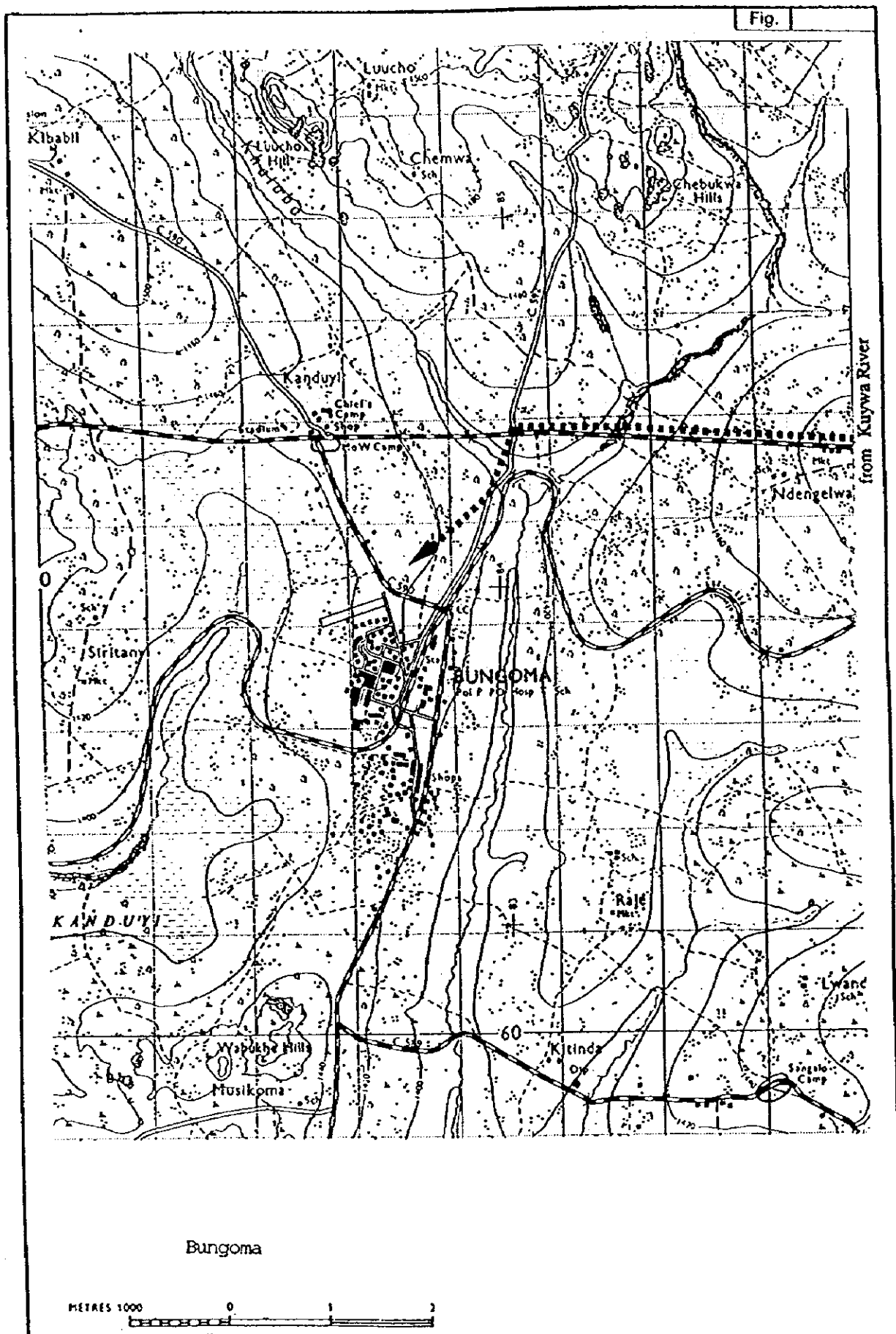
Treatment : *Full Treatment* Capacity : *4,000 m³/d*

Design year : *2020*

Design population : *80,000*

Remarks

In addition to Kuywa River intake, there are 3 No. boreholes. Two of them supply directly to consumers, while 1 No. supplies to the District Hospital. Operation and maintenance require to be strengthened for efficient operation of the scheme. Majority of the consumer meters are not working.



**Aftercare Study on
the National Water Plan**

KIMILILI (1/1)

**Urban Water Supply
System Survey**

General

Name of Urban Centre : *Kimilili*

Organisation/Water Undertaker : *Ministry of Water Resources*

District : *Bungoma*

Location : *Kimilili*

Map (1/50,000) Ref. no : *88/1*

Co-ordinates X : *34° 44' E*

Y : *00° 48' N*

Drainage Sub-basin : *108*

Existing facilities

Source : *River*

Type of Intake : *Weir*

Elevation : *m*

Raw water system : *Gravity*

H : *m* Dia : *150/100 mm*

Treatment Process :

Conventional Full Treatment

Designed Capacity : *2200 m³/d*

Treated water/Distribution system -

Area covered : *km²*

Distribution mains (80mm and above): *80 mm to 200 mm*

Total length : *90 km*

UFW (Estimated) : *m³/d*

Consumers - Total no : *1760*

Metered : *670*

Unmetered : *1090*

Working Meters:

Remark :

Water production : *4123 m³/d*

Service area population : *113,100*

Population served : *93,800*

Financial/Revenue

O & M costs :Kshs *2,328,504 - 1996*

Revenue earned :Kshs *1,549,285 - 1996*

Revenue collected :Kshs *1,392,613 - 1996*

Rehabilitation required/costs

i) *Intake and treatment works*

ii) *Storage*

iii) *Staff housing*

iv) *Distribution network*

v) *Meters*

Estimated Cost

Kshs

13,500,000

2,500,000

800,000

17,000,000

2,000,000

Total

35,800,000

Future development plan

Source :

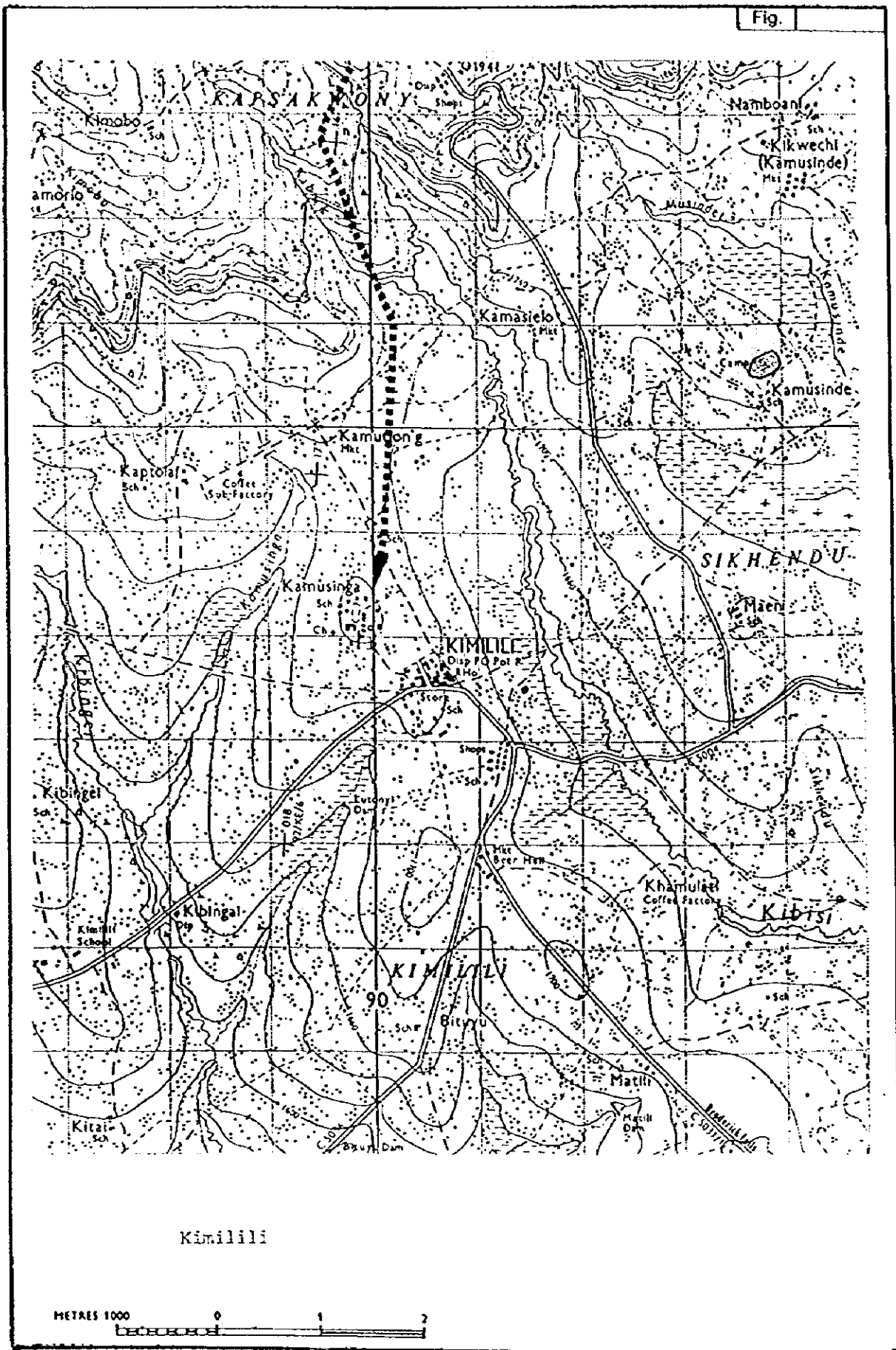
Treatment : *Conventional Full* Capacity : *4,000 m³/d*

Design year :

Design population :

Remarks

Raw water intake is facing sitation and the raw water main is inadequate to cater for the present demand.



**Aftercare Study on
the National Water Plan**

WEBUYE (1/1)

**Urban Water Supply
System Survey**

General

Name of Urban Centre : *Webuye*

Organisation/Water Undertaker : *Ministry of Water Resources*

District : *Bungoma* Location : *Webuye*

Map (1/50,000) Ref. no : *88/4*

Co-ordinates X : *34° 47' E* Y: *00° 37' N*

Drainage Sub-basin : *1DA*

Existing facilities

Source : *River*

Type of Intake : *Weir/Sump*

Elevation : *1520 m*

Raw water system : *Pumping*

H: *m* Dia : *250 mm*

Treatment Process :

Conventional Full Treatment - TCL and Alum dosed at 5.5 kg/d and 113 kg/d respectively. High level of Alum dosage due to high turbidity

Designed Capacity : *1800 m³/d*

Treated water/Distribution system -

Area covered : *km²*

Distribution mains (80mm and above): *80 mm to 250 mm*

Total length : *43 km*

UFW (Estimated) : *m³/d*

Consumers - Total no : *2106*

Metered : *1552*

Unmetered : *554*

Working Meters:

Water production : *1700 m³/d*

Remark :

Service area population : *52,000*

Population served : *40,000*

Financial/Revenue

O & M costs :Kshs

Revenue earned :Kshs *1,790,000*

Revenue collected :Kshs *1,959,996*

Rehabilitation required/costs

Estimated Cost

Kshs

i) *Intake and treatment works (composite)*

13,500,000

ii) *Storage*

1,200,000

iii) *Staff housing*

1,400,000

iv) *Distribution network*

10,000,000

v) *Meters*

4,500,000

Total

30,600,000

Future development plan

Source :

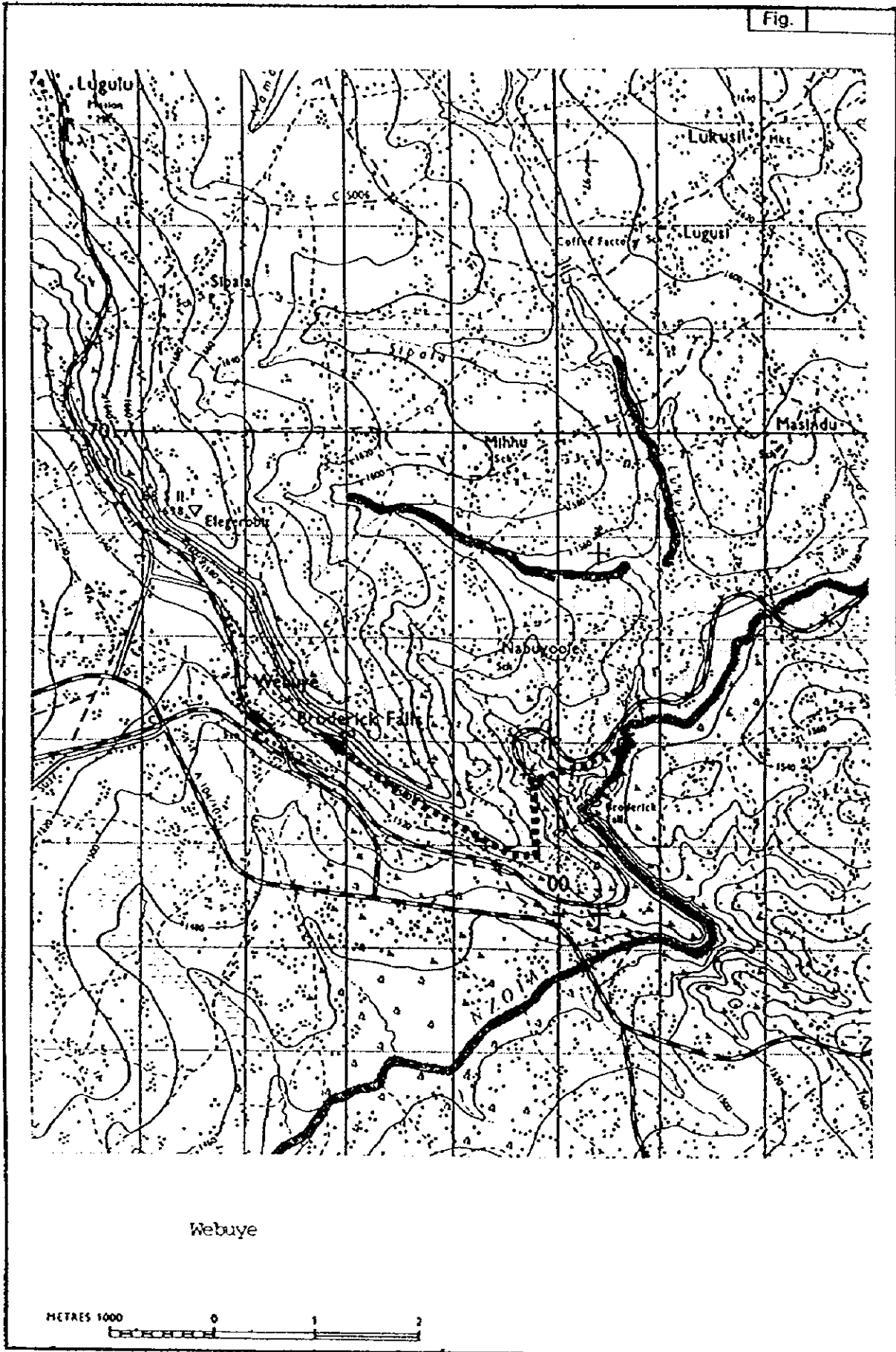
Treatment : *Conventional Full* Capacity : *4,500 m³/d*

Design year :

Design population :

Remarks

Power supply interruptions and inadequate chemicals supply affect the supply adversely. Tools and equipment are inadequate and the operation and maintenance does not have transport.



**Aftercare Study on
the National Water Master Plan**

CHEPTAIS (1/1)

General

Name of Urban Centre : *Cheptais*
 Organisation/Water Undertaker : *Ministry of Water Resources*
 District : *Mt. Elgon* Location : *Cheptais*
 Map (1/50,000) Ref. no : *87/2* Co-ordinates X : *34° 29' E* Y : *00° 50' N*
 Drainage Sub-basin : *1AA*

Existing facilities

Source : *Malikisi River* Type of Intake : *Weir* Elevation : *2135 m*
 Raw water system : *Gravity* H : *50 m* Dia : *150/100 mm*
 Treatment Process : *Full Conventional Treatment*
Chlorine and alum are dosed at rates of 6 kg/day and 30 kg/day respectively. Soda Ash is not used. The dosage varies with seasons.

Designed Capacity : *100 m³/hr*
 Treated water/Distribution system -

Area covered : *1 km²*
 Distribution mains (80mm and above): *60 mm to 100 mm*
 Total length : *6.3 km*

UFW (Estimated) : *m³/d*
 Consumers - Total no :
 Metered :
 Unmetered :

Working Meters:

Water production : *m³/d*
 Service area population :
 Population served :

Remark :

Financial/Revenue

O & M costs : *Kshs*
 Revenue earned : *Kshs 152,731/=*
 Revenue collected : *Kshs 100,864/=*

Kshs

Rehabilitation required/costs

- i)
- ii)
- iii)
- iv)
- v)
- vi)

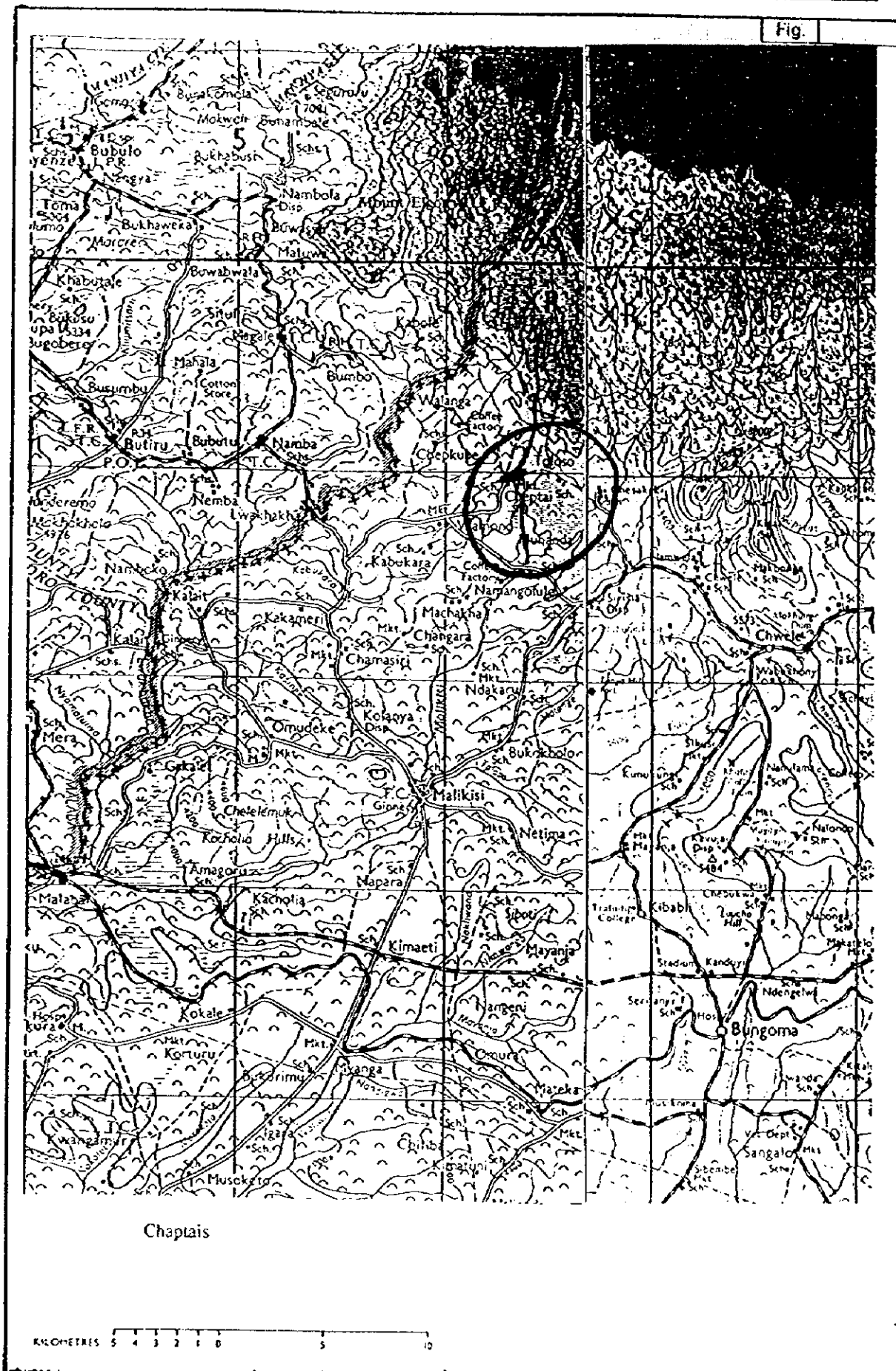
Total estimated cost

Future development plan

Source :)
 Treatment : Capacity : *m³/d*) *No data available.*
 Design year :)
 Design population :)

Remarks

Cheptais W/S not only serves Cheptais township, but beyond too. From the same T/Works, another 150 mm dia. main serves Sirisia. To overcome the persistent water shortages in Cheptais Township, a 75 mm dia. pipeline was extended from the nearby Lwakuokho Luandenyi Water Supply.



Chaptais

KILOMETRES 5 4 3 2 1 0 5 10

Aftercare Study on
the National Water Master Plan

BUSIA (1/1)

Urban Water Supply
System Survey

General

Name of Urban Centre : *Busia*
 Organisation/Water Undertaker : *Ministry of Water Resources*
 District : *Busia* Location : *9215 - South Teso*
 Map (1/50,000) Ref. no : *101/1* Co-ordinates X : *34° 07'* Y : *N 00° 29'*
 Drainage Sub-basin :

Existing facilities

Source : *Sio River / 8 No. Boreholes* Type of Intake : *Weir* Elevation : m
 Raw water system : *Pumping* H : m Dia : *200 mm*
 Treatment Process :

*Full Conventional Treatment - Coagulation, Sedimentation, Filtration and Disinfection by Chlorination (TCL).
 Dosing of chemicals is done on daily basis. However, delays in purchase/delivery of chemicals result in water
 supply interruption or supply of untreated water.*

Designed Capacity :

Treated water/Distribution system - Area covered : *3.0 km²*
 Distribution mains (80mm and above): *60 mm to 100 mm*
 Total length: *9.0 km*

UFW (Estimated) : *m³/d*

Consumers - Total no :

Working Meters: *Details not available*

Metered :

Unmetered :

Water production : *2072 m³/d*

Remark : *Details of the consumers not
 available at District Water Engineer's
 Office*

Service area population : *50,000*

Population served :

Financial/Revenue - 1996/97

O & M costs :Kshs *5,891,251*

Revenue earned :Kshs *1,860,952*

Revenue collected :Kshs *2,148,362*

Rehabilitation required/costs

Estimated Cost Kshs

i) *Augmentation of Existing Treatment Works and Treated Water Pumps*

Total *35,000,000*

Future development plan

Source : *Expansion of Existing Treatment Works*

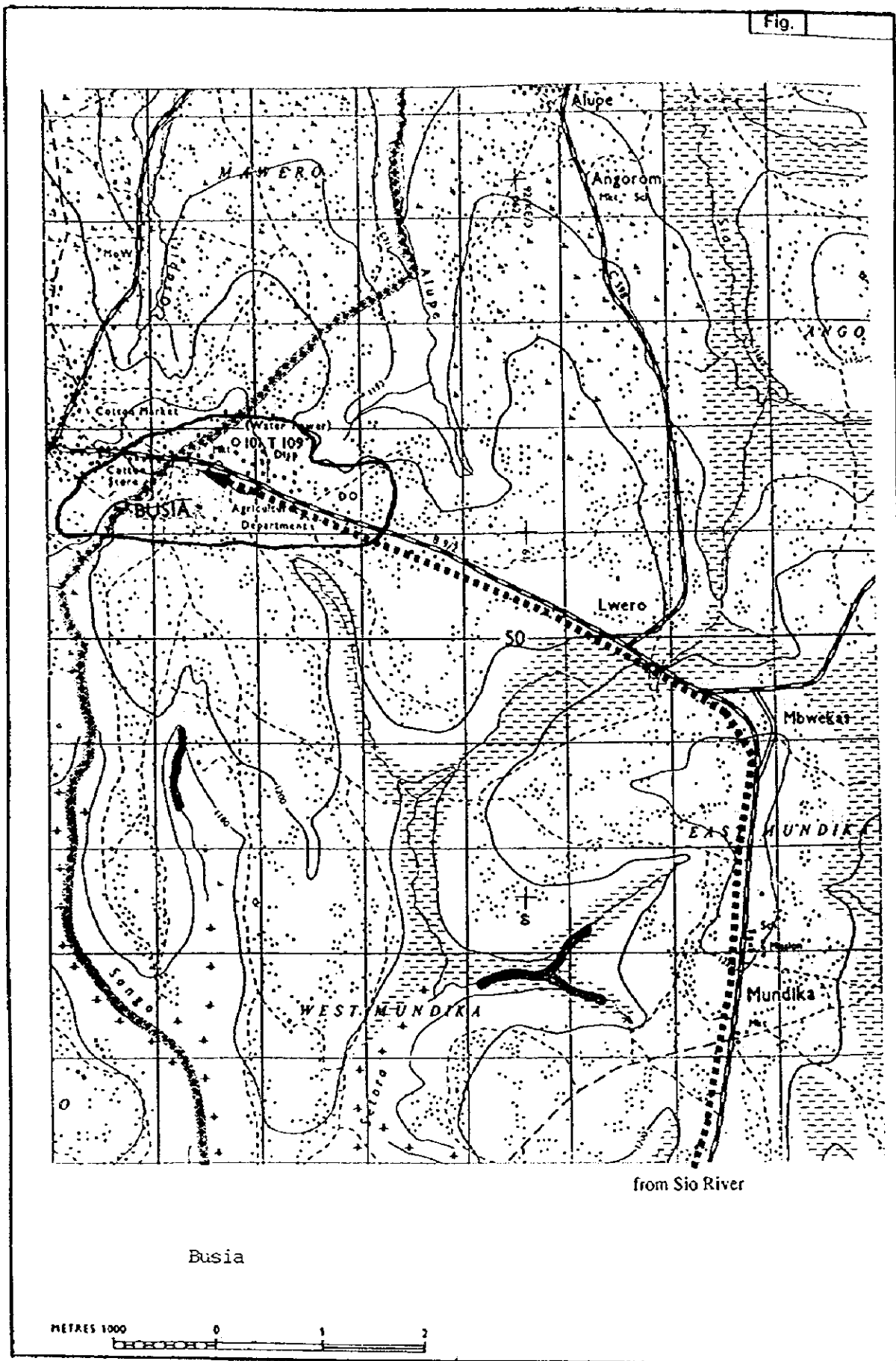
Treatment : *Full Conventional* Capacity : *3100 m³/d*

Design year : *2005*

Design population : *70,000*

Remarks

The existing water supply system is not adequate to meet the demand of the growing urban population. There are no records available/kept of service connections. Operation and maintenance requires to be strengthened for efficient operation of the water supply system.



**Aftercare Study on
the National Water Master Plan**

NAMBALE (1/1)

**Urban Water Supply
System Survey**

General

Name of Urban Centre : *Nambale*

Organisation/Water Undertaker : *Ministry of Water Resources*

District : *Busia*

Location : *922.2 Central Bukhayo*

Map (1/50,000) Ref. no : *101/2*

Co-ordinates X : *34° 16'*

Y : *N 00° 28'*

Drainage Sub-basin :

Existing facilities

Source : *Boreholes - 4 No.*

Type of Intake :

Elevation :

m

Raw water system : *Pumping*

H :

m

Dia : *100mm*

Treatment Process :

No Treatment. Most consumers do complain about the quality of water being supplied. Waterborne diseases are common in this area.

Designed Capacity :

Treated water/Distribution system -

Area covered : *20 km²*

Distribution mains (80mm and above): mm to mm

Total length : km - *Details not available*

UFW (Estimated) : m³/d

Consumers - Total no :

Working Meters:

Metered :

Unmetered :

Water production : *159 m³/d*

Remark :

Service area population :

Population served :

Financial/Revenue

O & M costs :Kshs *608,025*

Revenue earned :Kshs *426,179*

Revenue collected :Kshs *392,228*

Rehabilitation required/costs

Estimated Cost

Kshs

i)

ii)

iii)

iv)

v)

vi)

Total

Future development plan

Source : *Sinking 1 No. Borehole*

Treatment : *Chlorination* Capacity : *200 m³/d*

Design year : *2005*

Design population : *3,500*

Remarks

Nambale Water Supply was constructed in 1957 and rehabilitated / augmented in 1988 and 1992. According to the District Water Engineer the existing source and distribution system is not adequate to meet the water demand of the growing Urban population. River Sio is a possible source of water for Nambale Urban. There are no records available, kept of service connections.

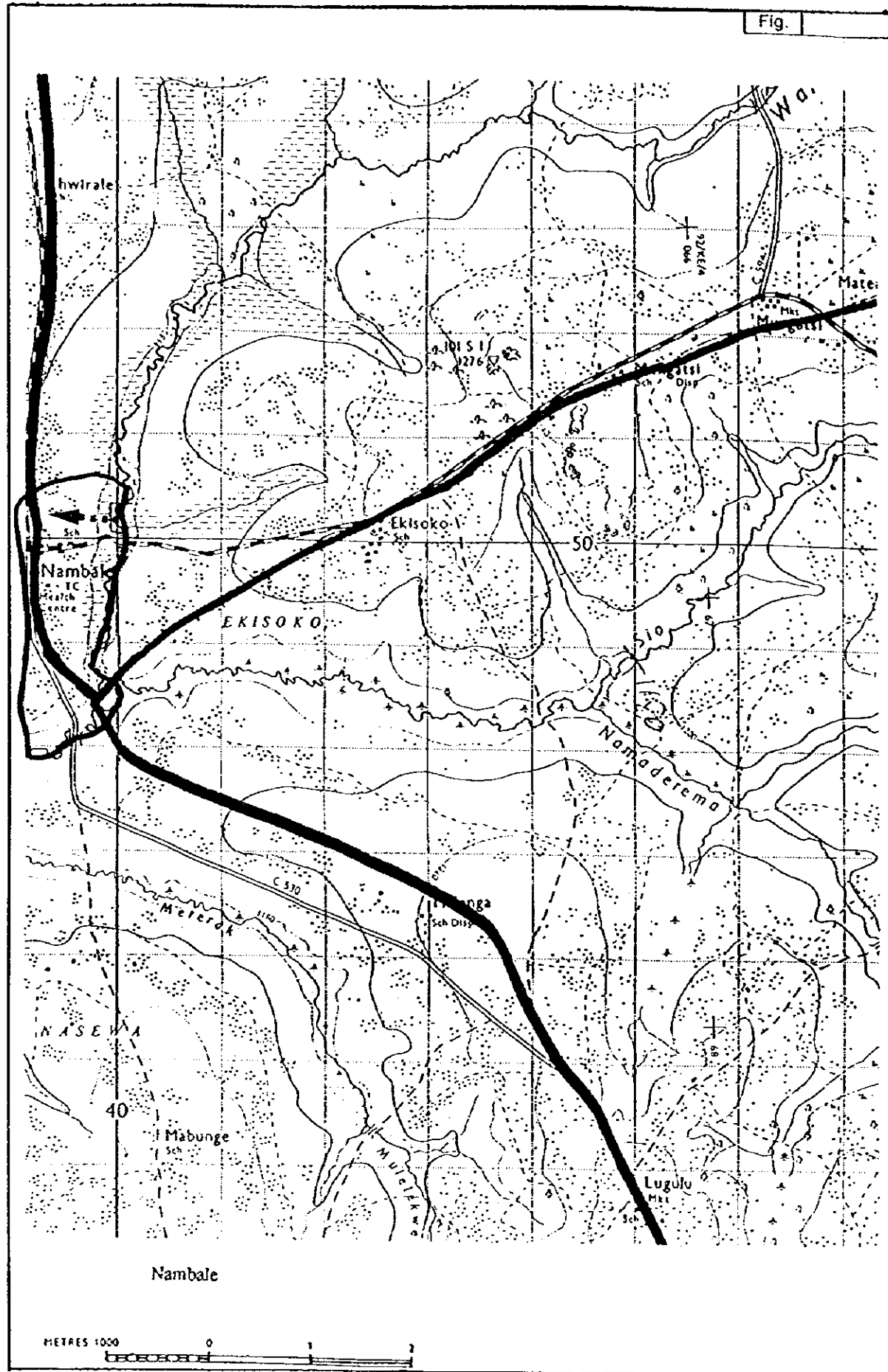


Fig.

Aftercare Study on
the National Water Master Plan

MASENO/LUANDA (1/1)

Urban Water Supply
System Survey

General

Name of Urban Centre : Maseno / Luanda
 Organisation/Water Undertaker : Ministry of Water Resources
 District : Vihiga Location : 931.3 West Bunyole
 Map (1/50,000) Ref. no : 102/3 Co-ordinates X : 34° 36' Y : N 00° 02'
 Drainage Sub-basin :

Existing facilities

Source : Open Furrow Type of Intake : Weir Elevation : m
 Raw water system : Pumping H : m Dia : 225 mm
 Treatment Process :

Full Conventional Treatment - Coagulation, Sedimentation, Filtration and Disinfection by Chlorine (TCL).
 Dosing of chemicals is done on daily basis. Chemicals dosed are Chlorine (TCL), Alum and Soda Ash. Dosage rate of the chemicals is not known.

Designed Capacity :

Treated water/Distribution system - Area covered : 1.5 km²
 Distribution mains (80mm and above): 100 mm to 150 mm
 Total length : 31 km

UFW (Estimated) : m³/d

Consumers - Total no : 1750

Metered : 750

Unmetered : 1000

Working Meters:

Water production : 1192 m³/d

Remark :

Service area population : 71,400

Population served : 68,400

Financial/Revenue

O & M costs :Kshs

Revenue earned :Kshs 2,924,489

Revenue collected :Kshs 2,128,817

Rehabilitation required/costs

	Estimated Cost	Kshs
i) Rehabilitation of Intake Weir		300,000
ii) Installation of 3 No. Treated Water Pumps and Electrical Control Panel		5,700,000
iii) Augmentation of the Rising Main (250mm dia.)		30,000,000
iv) Rehabilitation of Sedimentation Tanks and Furrow		12,000,000
v) Construction of 1 No. Storage Tank		1,500,000
Total		109,500,000

Future development plan

Source : Not identified

Treatment : Full Conventional Capacity : 7,200 m³/d

Design year : 2018

Design population : 144,089

Remarks

Maseno Water Supply was constructed in 1957 and expanded in 1978 and 1987. The scheme has been adversely affected by the recent heavy rains with section of the furrow washed away and filters clogged. Some section of distribution system has also been washed away. The existing water supply is not adequate to meet the demand of growing urban population.

Aftercare Study on
the National Water Master Plan

VIHIGA/MAJENGO (1/1)

Urban Water Supply
System Survey

General

Name of Urban Centre : *Vihiga / Majengo*

Organisation/Water Undertaker : *Ministry of Water Resources*

District : *Vihiga* Location : *932.5 Central Maragoli*

Map (1/50,000) Ref. no : *102/3* Co-ordinates X : *34° 44'* Y : *N 00° 03'*

Drainage Sub-basin :

Existing facilities

Source : *Spring* Type of Intake : _____ Elevation : _____ m

Raw water system : *Pumping* H : _____ m Dia : *50 mm*

Treatment Process :

No Treatment except disinfection by chlorination (TCL). Sometimes water is supplied to consumers without disinfection as a result of delays in purchase/delivery of chlorine.

Designed Capacity :

Treated water/Distribution system -

Area covered : *1.0 km²*

Distribution mains (80mm and above): *80 mm to N/A mm*

Total length : *1.5 km*

UFW (Estimated) : _____ m³/d

Consumers - Total no : *245*

Metered : *185*

Unmetered : *60*

Working Meters: *147 - Based on survey carried out for 10 No. connections*

Water production : *63 m³/d*

Remark :

Service area population : *15,000*

Population served : *12,000*

Financial/Revenue - 1996/97

O & M costs :Kshs

Revenue earned :Kshs *276,635*

Revenue collected :Kshs *371,296*

Rehabilitation required/costs

Estimated Cost

Kshs

i) *Installation of 1 No. standby pump - 65 m³/day*

300,000

ii) *Augmentation of existing distribution system*

850,000

Total

1,150,000

Future development plan - N/A

Source :

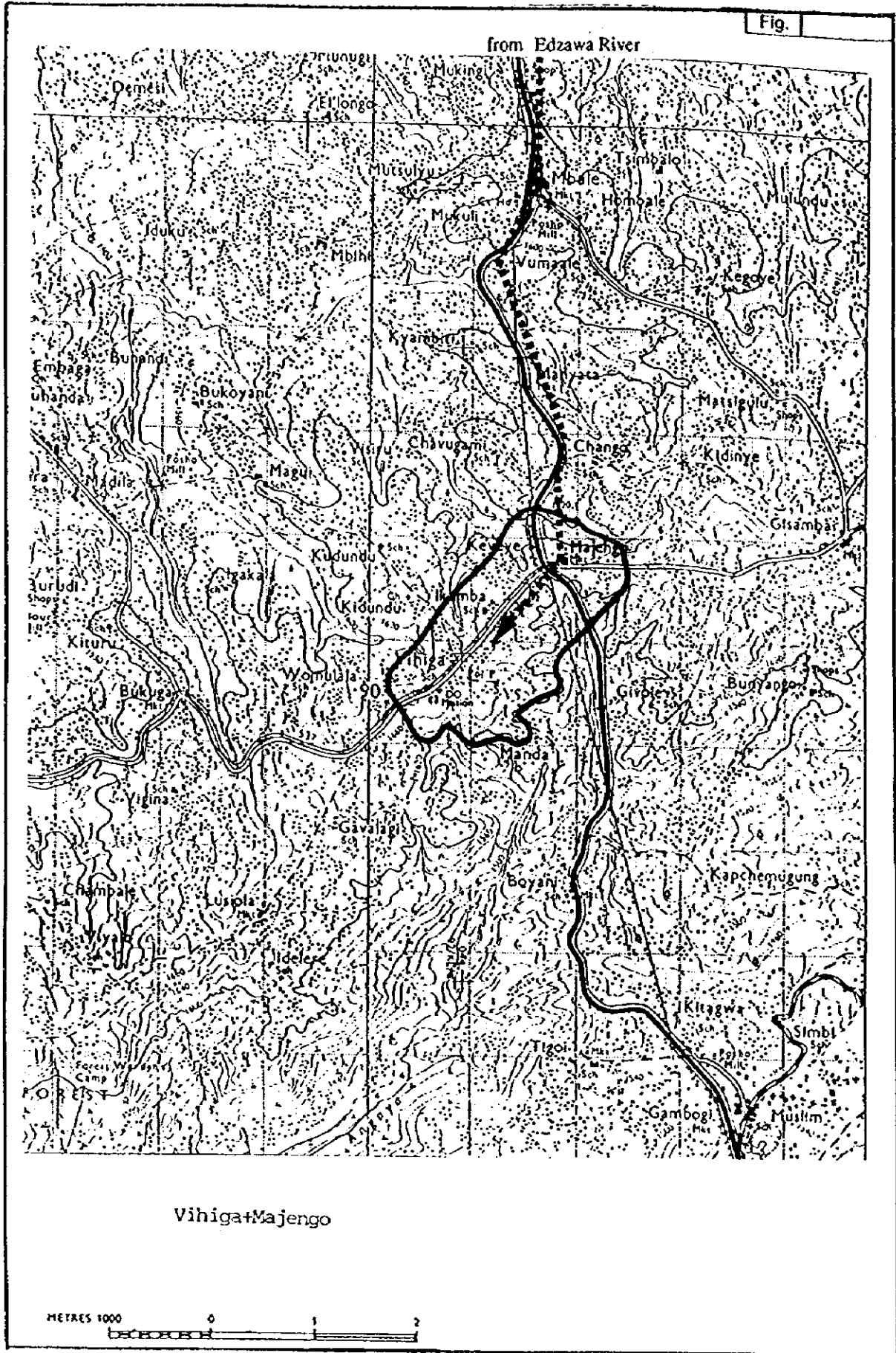
Treatment : Capacity : _____ m³/d

Design year :

Design population :

Remarks

The water source for Vihiga/Majengo Urban Water Supply is from a spring which was constructed in 1947. According to the District Water Engineer the supply is not adequate to meet the water demand of the growing urban population. All consumers should be metered and existing faulty meters repaired in order to control wastage of water and enhance revenue collection. Alternative source with full conventional treatment should be considered.



**Aftercare Study on
the National Water Master Plan**

KAIMOSI (1/1)

**Urban Water Supply
System Survey**

General

Name of Urban Centre : *Kaimosi*

Organisation/Water Undertaker : *Ministry of Water Resources*

District : *Vihiga*

Location : *933.1 Shamakhokho*

Map (1/50,000) Ref. no : *10214*

Co-ordinates X : *34° 51'*

Y : *N 00° 08'*

Drainage Sub-basin :

Existing facilities

Source : *Dam*

Type of Intake : *Furrow* Elevation : *1700 m AOD*

Raw water system : *Gravity*

H : *m* Dia : *200 mm*

Treatment Process : *Full Conventional Treatment - Coagulation, Sedimentation, Filtration and Disinfection by Chlorine (TCL). Dosing of chemicals (ALum, Soda Ash and Chlorine) is carried out on daily basis. However, delays on delivery/purchase of chemicals result in water supply interruption or supply of untreated water to consumers*

Designed Capacity :

Treated water/Distribution system -

Area covered : *4.0 km²*

Distribution mains (80mm and above): *80mm to 150mm*

Total length : *30 km*

UFW (Estimated) : *m³/d*

Consumers - Total no : *1350*

Working Meters:

Metered : *450*

Unmetered : *900*

Water production : *597 m³/d*

Remark :

Service area population : *70,000*

Population served : *52,500*

Financial/Revenue - 1996/97

O & M costs :Kshs *6,116,660*

Revenue earned :Kshs *2,616,221*

Revenue collected :Kshs *912,910*

Rehabilitation required/costs

- i) *Rehabilitation of Intake Works / Spillway*
- ii) *Desilting of the Furrow*
- iii) *Grading of Existing Access Road*
- iv) *Installation of 2 No. Treated Water Pumps*
- v) *Rehabilitation of 2 No. Elevated Tanks*

Estimated Cost

Kshs

Total

24,000,000

Future development plan

Source : *Idzava River*

Treatment : *Full Conventional* Capacity : *2880 m³/d*

Design year : *2018*

Design population :

Remarks

The Kaimosi Water Supply was constructed by Friends Mission Church in 1957 and was handed over to the Ministry of Water Resources in 1960. According to the District Water Engineer the present water production is 597 m³/day and the demand of the area served stands at approximately 3,200 m³/day. 66% of the consumers are not metered. In order to control wastage of water, ensure equitable distribution of water to more consumers and enhance revenue collection, all consumers should be metered and all existing faulty meters repaired.

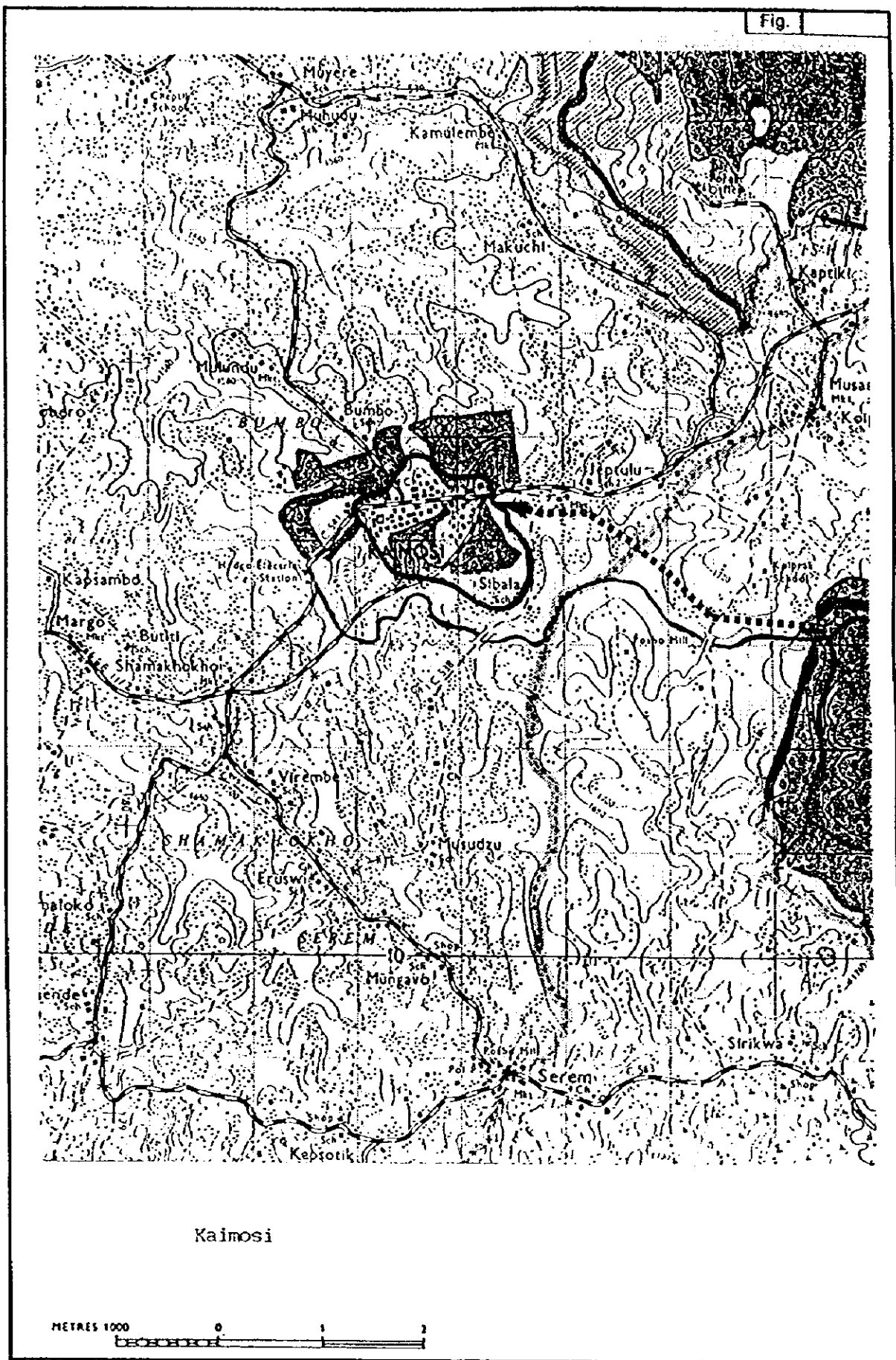
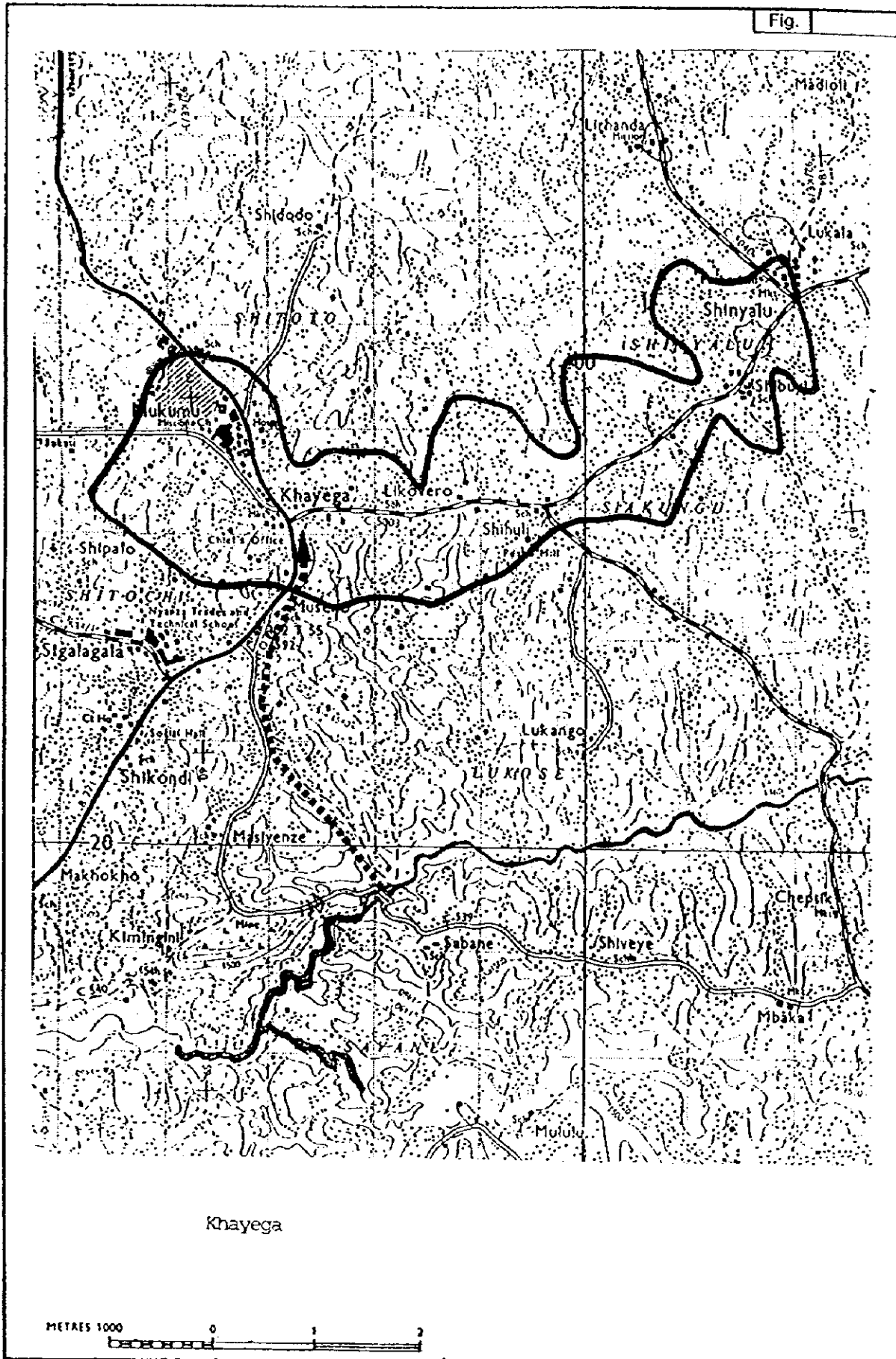


Fig.



**Aftercare Study on
the Natloani Water Master Plan**

KAKAMEGA (1/1)

**Urban Water Supply
System Survey**

General

Name of Urban Centre : Kakamega

Organisation/Water Undertaker : National Water Conservation & Pipeline Corporation

District : Kakamega

Location : Kakamega Municipality

Map (1/50,000) Ref. no : 102/2

Co-ordinates X : 34° 46'

Y : N 00° 18'

Drainage Sub-basin : 1EB

Existing facilities

Source : Isukhu River and Boreholes - 4 No.

Type of Intake : Weir

Elevation : 1510 m

Raw water system : Pumping - 7 No. Pumps

H : m Dia : 150 & 250 mm

(5 No. operational)

Treatment Process :

Full Conventional Treatment - Coagulation, Sedimentation, Filtration and Disinfection by Chlorine (TCL).

Chemicals are dosed on daily basis. Chemical dosed are Alum, Soda Ash and Chlorine. Dosage rate of the chemicals varies and is not known

Designed Capacity :

Treated water/Distribution system -

Area covered : 3.0 km²

Distribution mains (80mm and above): 80 mm to 250 mm

Total length : km - Details not available

UFW (Estimated) : m³/d

Consumers - Total no : 5,456

Metered : 5,422

Unmetered : 34

Working Meters:

Data not available

Water production : m³/d

) Remark :

Service area population :

)

Population served :

)

Financial/Revenue

) Details not available

O & M costs :Kshs

)

Revenue earned :Kshs

)

Revenue collected :Kshs

)

Rehabilitation required/costs

Estimated Cost

Kshs

i) Augmentation of Existing Distribution System

2,000,000

ii) Construction of 1 No. Storage Tank

500,000

Total

2,500,000

Future development plan

Source : Isukhu River

Treatment : Full Conventional Treatment

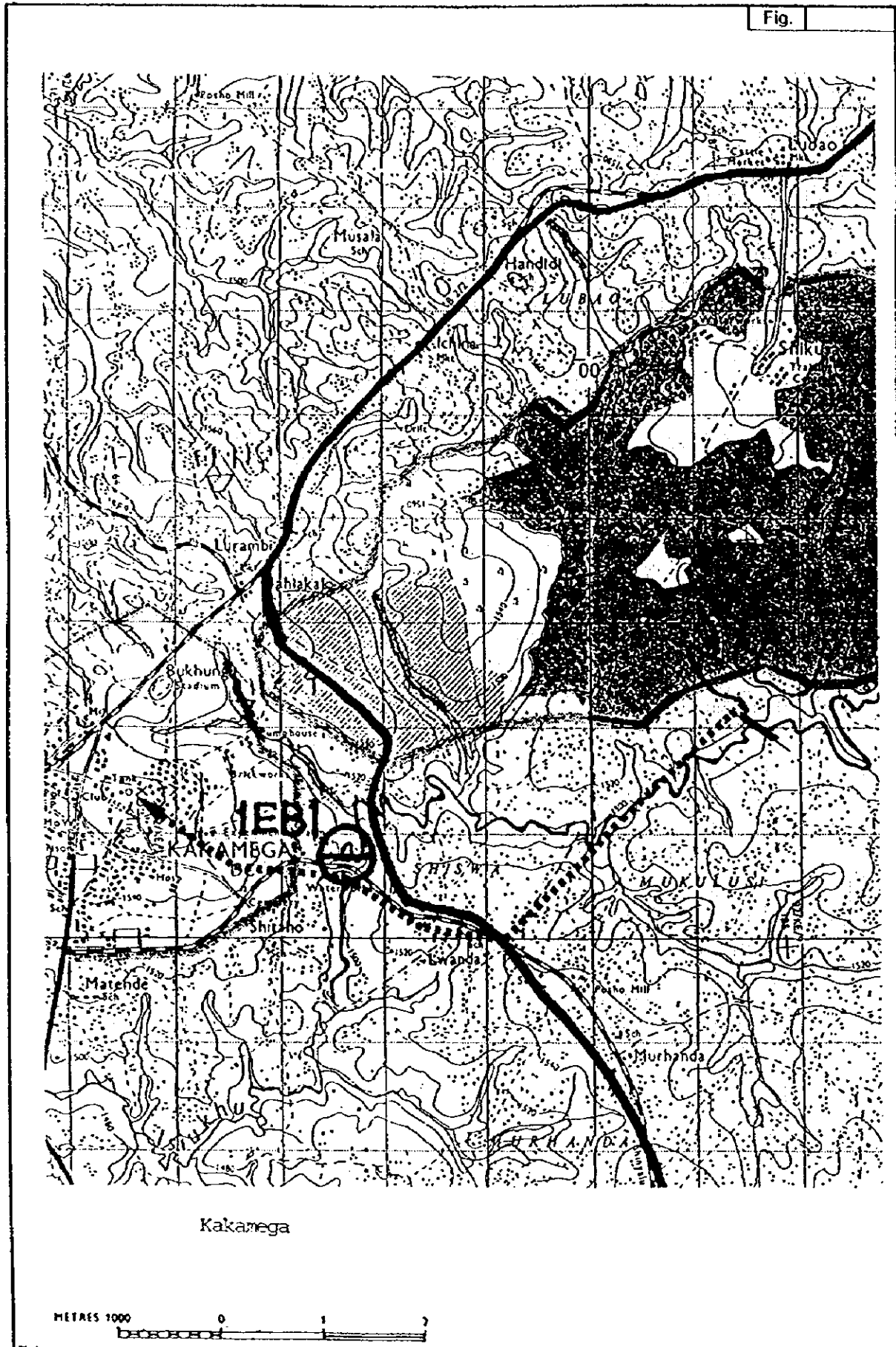
Capacity : 8,500 m³/d

Design year : 1997

Design population : 250,000

Remarks

The present water supply system comprises of two schemes/sources which use both surface water and ground water. Production/financial details are not available/kept by the Scheme Manager.



**Aftercare Study on
the National Water Master Plan**

BUTERE (1/1)

**Urban Water Supply
System Survey**

General

Name of Urban Centre : Butere

Organisation/Water Undertaker : Ministry of Water Resources

District : Kakamega

Location : 939.2 Central Marama

Map (1/50,000) Ref. no : 101/4

Co-ordinates X : 34° 30' Y: N 00° 13'

Drainage Sub-basin :

Existing facilities

Source : 3 No. Boreholes

Type of Intake : Borehole Elevation : 1320 m AOD

Raw water system : Pumping

H : Dia : mm

Treatment Process : Disinfection by chlorination only at the elevated storage tank. Dosing of chlorine is done manually and sometimes the operators are not willing to climb up 6m high elevated tank with a bucket of chlorine solution. However, dosing is supposed to be done on daily basis.

Designed Capacity :

Treated water/Distribution system -

Area covered : 3.0 km²

Distribution mains (80mm and above): 80mm to 100mm

Total length : 1.35 km

UFW (Estimated) : m³/d

Consumers - Total no : 303

Metered : 204

Unmetered : 99

Working Meters:

120 - Based on survey carried out for ten connections - 4 meters out of 10 not working -40%

Water production : 264 m³/d

Remark : Production data based on volumetric test at the storage tank and bulk meter readings

Service area population :

Population served : 5,000

Financial/Revenue - 1996/97

O & M costs :Kshs

Revenue earned :Kshs 889,766

Revenue collected :Kshs 386,112

Rehabilitation required/costs

- i) Construction of 4 No. Storage Tanks
- ii) Rehabilitation of Existing Staff Houses
- iii) Rehabilitation of Existing Distribution System
- iv) Repairing Valves, Washouts, etc.

Estimated Cost Kshs

Total Costing not yet worked out

Future development plan

Source : Drilling Additional 2 No. Boreholes

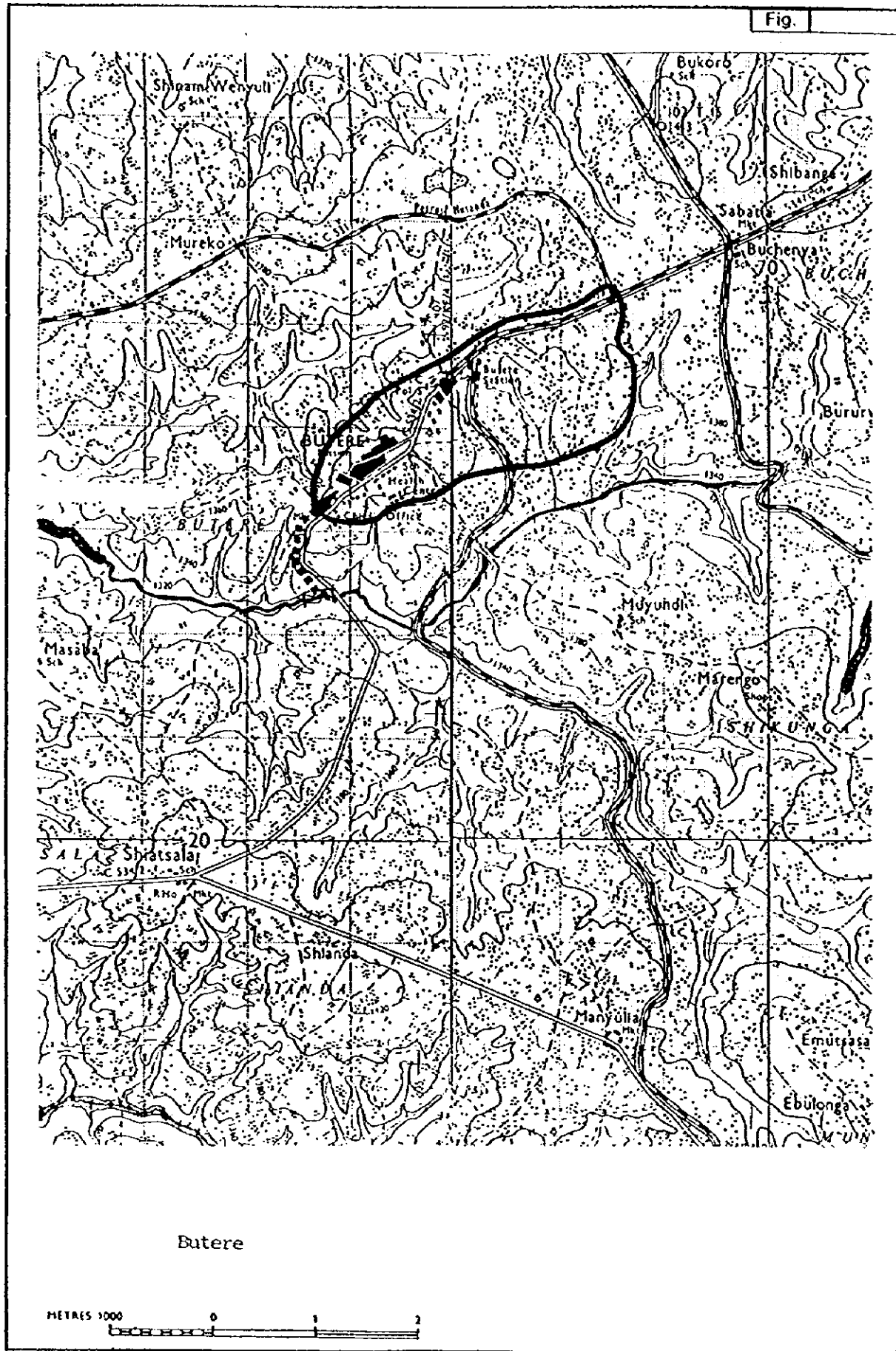
Treatment : Capacity : m³/d

Design year :

Design population :

Remarks

Butere Water Supply comprise of 3 No. Boreholes and the supply is not adequate to meet the demand of the area served. The scheme suffers from frequent power interruption which sometimes cause damage to Submersible Pumps and water supply interruption. Chlorine dosing equipment and pumps should be installed and all consumers metered and faulty meters repaired.



**Aftercare Study on
the National Water Master Plan**

MUMIAS (1/1)

**Urban Water Supply
System Survey**

General

Name of Urban Centre : *Mumias*
 Organisation/Water Undertaker : *Ministry of Water Resources*
 District : *Kakamega* Location : *93A.4 Central Wang*
 Map (1/50,000) Ref. no : *101/2* Co-ordinates X : *34° 30'* Y : *N 00° 21'*
 Drainage Sub-basin :

Existing facilities

Source : *Lusumu River / Borehole - 1 No.* Type of Intake : *Weir* Elevation : *1340 m AOD*
 Raw water system : *Gravity* H : *m* Dia : *200 mm*
 Treatment Process :

Full Conventional Treatment - Coagulation, Sedimentation, Filtration and Disinfection by Chlorination.
Dosing of chemicals is done on daily basis.

Designed Capacity :

Treated water/Distribution system - Area covered : *6.0 km²*
 Distribution mains (80mm and above): *80mm to 225 mm*
 Total length : *24 km*

UFW (Estimated) : *m³/d*

Consumers - Total no : *944*

Metered : *814*

Unmetered : *130*

Working Meters: *Most Meters are buried and unserviceable*

Water production : *1498 m³/d*

Remark :

Service area population : *20,000 - 1994 Census Data*

Population served : *12,440*

Financial/Revenue - 1996/97

O & M costs : *Kshs*

Revenue earned : *Kshs 5,785,106*

Revenue collected : *Kshs 4,506,799*

Rehabilitation required/costs

Estimated Cost

Kshs

- i) *Augmentation of Existing Treatment Works*
- ii) *Rehabilitation of the Rising Main Replacing Existing uPVC with GMS Pipe*
- iii) *Construction of Staff Houses and Installation of Office Equipment*
- iv) *Installation of Laboratory Equipment for Chemical Testing*

Total

11,022,000

Future development plan

Source : *Expansion of Existing Source*

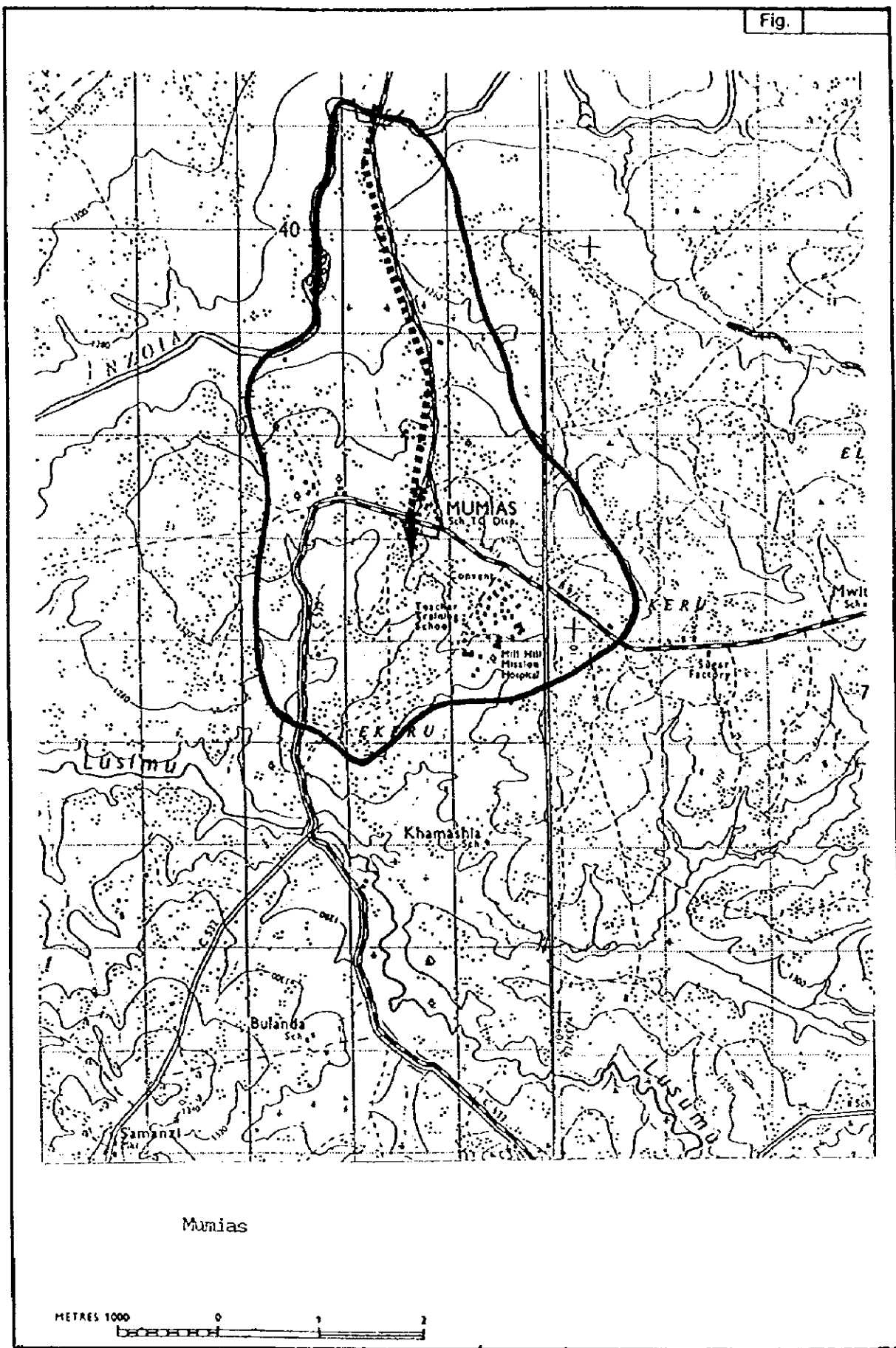
Treatment : *Full Conventional* Capacity : *m³/d*

Design year : *2000*

Design population :

Remarks

KEFIMCO Programme carried out rehabilitation of Existing Water Supply System in 1992 which comprised of augmentation of the rising main, installation of 3 No. treated water pumps and sinking and installing equipment for 1 No. borehole. However, the scheme is not yet able to meet the demand of the area served of the growing urban population.



Mumias

METRES 1000 0 1 2