9.8 Recommended Institutional Options and Legal Implications

In the light of the above analysis and the requirements of both the Government of Kenya and JICA, the registration of a trust corporation to take over the water supply and sanitation services would be the best option. This option not only meets the requirements of the two parties but also presents fewer logistical and operational problems.

The legal requirement will be as follows:-

(a) Application for registration in the prescribed form accompanied by,

(b) A statement of the objects and constitution of the trust concerned, e.g. to take over and operate the Makindu water supply service, to enter into an agreement for the lease of any assets and equipment, to impose and charge tariffs for the supply of such services, to employ such personnel or such terms and conditions as may be deemed necessary, to formulate working arrangements for the effective and efficient operation of the water supply, to acquire and hold such property as may be necessary for the discharge of its functions, etc;

(c) A statement and short description of the property or interest therein which at the date of application is held or intended to be held by the trust;

(d) A statement as to whether the trust concerned is a society registered or exempt from registration, or is incorporated under the Companies Act;

(e) The names and addresses of the trustees;

(f) The proposed title of the corporate body, of which the words "trustees" and "registered" shall form part, e.g. THE REGISTERED TRUSTEES OF ------- (TOWN) WATER SUPPLY SERVICE;

(g) The proposed device of the common seal; and

(h) The regulations for the custody and use of the common seal.

Under the constitution in (b) above, provisions can be made for the number of trustees to be registered and how these may be appointed do as to be representative of all the stakeholders.

Organizationally, the Board of Trustees will have the overall management of the trust in order to ensure efficient delivery of services to the consumers. To this extent, it will be its responsibility to hire the management staff and such other personnel as may be required. To ensure transparency and accountability, the Board of Trustees will be expected to consult regularly with the major stakeholders on the progress achieved in implementing the mandate of the Trust. This consultative process will be provided in the trust instrument.

9.9 Institutional Framework for the Proposed Makindu Urban Water Supply Service.

In this section we develop the organisational structures and operating mechanism for the Trust Corporation, which is the recommended institutional and legal option for Makindu Urban Water Supply Service.

9.9.1 Organisational Structure

The proposed institutional framework comprises the following structures:

(a) The Board of Trustees (BOT)
(b) Management

The role of these structures is now defined.

9.9.2 Board of Trustees

The Board of Trustees will be the governing body of the Trust Corporation. It will acquire and manage assets on behalf of the stakeholders; and will be responsible for policy guidance and the strategic direction of the Trust Corporation. The Board of Trustees will be appointed from the current stakeholders of Makindu Urban Water Supply. Major stakeholders are:

(a) Makindu Administrators;

(b) District Water Officer (DWO);

(c) Major consumers, especially the co-operative societies , business enterprises and institutions (educational and health);

(d) Development partners;

(e) Religious organisations;

(f) Community water projects;

(g) District Social Development Officer (DSDO)

The initial appointment will be facilitated by the Inter-Ministrial Core Team. Thereafter, replacement within the Board of Trustees shall be effected by the Trustees themselves on the basis of agreed procedure. This renewal process will be detailed in the constitution of the Trust Corporation.

Other provisions enshrined in the constitution of the Trust are:

(i) That the number of trustees shall be between 5 - 7;

(ii) That Government representation shall be provided in BOT to safeguard public interest;

(iii) That BOT can co-opt, for particular purpose, an expert on issues of relevance to the Trust or beneficial to the advancement of the interests of the Trust;

(iv) That the Board of Trustees shall convene a stakeholders consultative forum every year to keep stakeholders closely informed of the progress in the affairs of the Trust Corporation.

The specific duties of the Board of Trustees are:

(a) To lease and / or acquire and own assets on behalf of the stakeholders;

(b) To appoint the General Manager and senior managers of the Trust Corporation and to fix their remuneration;

(c) To approve the organisational structure and the establishment level of the management and operational staff;

(d) To approve policy and strategy of the organisation;

(e) To approve the capital and operating budgets of the Trust Corporation;

(f) To monitor management performance in accordance with the agreed plans;

(g) To prepare and submit reports to the Stakeholder Council in the manner provided by law and the Trust Instrument.

9.9.3 Management

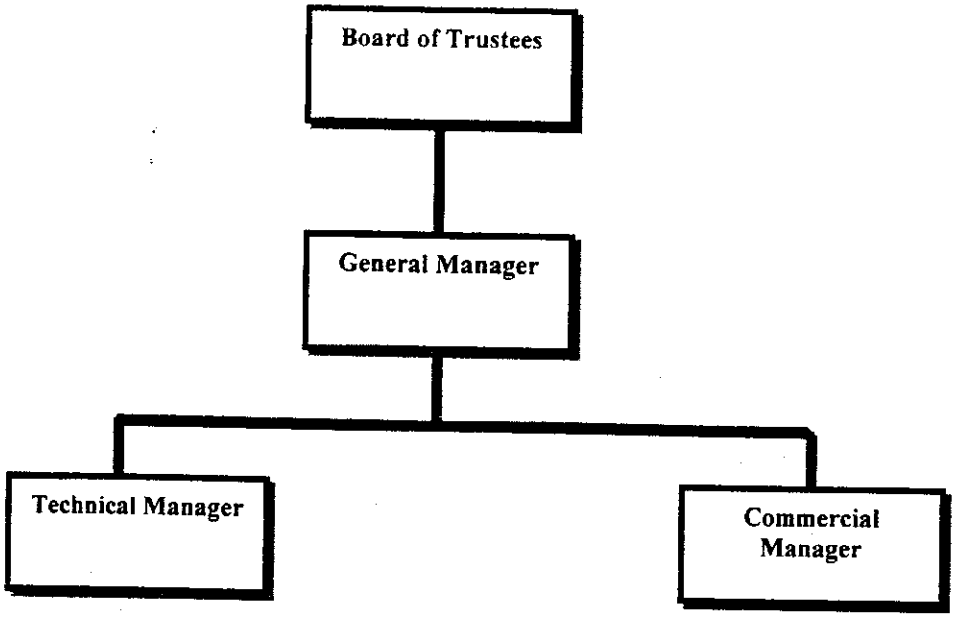
It should be noted that the Trust can operate the water supply and sewerage system in the Town. Alternatively, the Trust can contract out this function to a private operator. In the event the BOT decides to manage these services, it will appoint senior members of the Management Team.

These are:

(a) The General Manager
(b) The Technical Manager
(c) The Commercial Manager

Other positions will be approved by the BOT but will be recruited by the Management Team. The high level organisational structures of the Trust Corporation are illustrated in **Fig. 3.1.**

Fig. 3.1: High level organisational structures for Makindu Water Supply Service.



The General Manager: will be responsible for all aspects of the management and operations of the Trust Corporation. These include policy and strategy formulation for BOT approval and subsequent implementation after BOT approval.

The Technical Manager: will be responsible for operations and maintenance; and assets replacement for efficient supply of water and sanitation services.

The Commercial Manager: will be responsible for billing and revenue collection; accounting and financial management of the Trust Corporation. He / She will also approve water supply and sanitation connections and oversee customer service standards.

9.9.4 Syndication of Water Supply and Sewerage Services Management

It is quite possible that some of the smaller towns could derive economies of scale from syndication of the water supply and sewerage services management. This essentially means forming a management company to manage the water and sewerage services in two or more local towns.

The proposal to form a trust corporation on a syndicated basis must be seen against the need to ensure that stakeholders in the "catchment area" of the local town have a common interest in water and sewerage issues that directly affect them. It is unlikely that stakeholders in different local towns could show a common interest that would sustain the formation of a Water and Sewerage Services Trust Corporation encompassing these different towns. In the event, therefore, where syndication could

be a feasible option in the management of the water and sewerage services, this should be confined to the operational management aspects. In effect, therefore, Water and Sewerage Trust Corporations in the concerned local towns could contract out the operations and management of the water supply and sewerage services to a professional private sector operator. This is a feasible option in areas where expertise in the management of these essential services is limited. It is also a more practical and simpler solution than the formation of a management company by the Trust Corporation in the local towns. The latter is likely to suffer from over-politicisation of the leadership and management role of such a company.

9.9.5 Operating Mechanisms

The operations of the Trust Corporation will be as follows:

(a) The initial appointment to the Board of Trustees will be facilitated by the Interministerial Core Team. Appointment will be from current stakeholders and will include Government representation. A woman representative should also be appointment. Subsequent appointments to fill vacancies in the BOT shall be provided in the constitution of the Trust. The relevant provision should allow BOT to renew itself by appointing replacements from specified stakeholders. To obtain ownership and support of stakeholders to the proposed Trust and the appointment thereof, a sensitization and consensus building workshop involving major stakeholders should be held before the Trust Corporation is registered.

(b) The Board of Trustees will "hire and fire" the Senior Managers of the Trust Corporation. The BOT can also contract out the management of the water supply and sanitation system to a private operator. BOT must, however, ensure that the services of the Trust Corporation are not harmed by such an arrangement and will ensure that safeguards are in place to provide services in a sustainable manner. The BOT will own or lease assets and properties on behalf of the Trust Corporation and will enter into contracts with third parties. The BOT will sue and be sued on behalf of the Trust Corporation.

(c) The management (and / or management agent) will manage the day to day operations of the Trust Corporation. Management will be accountable for their performance to the Board of Trustees through regular reports and meetings of the Board of Trustees.

10 FINANCIAL, ECONOMIC AND SOCIAL EVALUATION

10.1 INTRODUCTION

This section provides the financial, economic and social evaluation of Makindu Urban Water Supply. The financial viability analysis is only useful for indicative purposes only. It is contended that projects of this nature should rely more on economic and social viability. These two aspects are given more emphasis in the evaluation.

10.2 INSTITUTIONAL MANAGEMENT COSTS

To obtain the desired results from the rehabilitation of the Makindu water supply, there will be need for new institutional arrangement. This will be supported by a change in management style. This involves substantial investment, which is taken as part of the cost of the project. The financial costs of undertaking this exercise are summarized in Table 10.1.

Table 10.1: Institutional Development Costs for Makindu Town Water Supply

No.	Activity	Bases of cost estimate	Estimated cost (Ksh.)
1	Hold consensus building workshop	(a) Travel refreshments and honorarium for 50 participants at SH. 5,000 /= per participant	250,000
		(b) Consultants facilitation costs and travel	700,000
		(c)Transport and related expenses for ministry staff	200,000
2	Develop and register the trust instrument	Legal and follow up effort	50,000
3	Management Contract	Appoint local expert to support the institutional rehabilitation process for the 3 year period	39,600,000
4	(a)Identify water supply and sewerage infrastructure and estimate cost (b) Identify and value other assets.	Standard infrastructural valuation procedures	5,000,000
5	Develop staffing and financial plans for the new organization	25 working days at Sh. 40,000 per w/day	1,000,000
6	Develop operations manual	20 working days at Sh. 30,000 per day	600,000
7	Operational Support	Vehicles, motor cycles, computers and software, office equipment	-
8	Provide initial working capital to the new organization	Average annual billings for the last 3 years	2,000,000
Sub -total			49,400,000
Contingency (10%)			4,940,000
Total			54,340,000

It is contended that the key problem in the town's water supply system is management weakness. Institutional support is recommended as the foundation for improving the nature and efficiency of management.

10.3 WATER TARIFFS

Makindu water supply scheme is subject to the tariff regime legally set by the Minister of Water. The legal tariffs are as indicated in Table 10.2.

Table 10.2: Urban Water Tariffs

PART I - GENERAL	Charge (Kshs.)
(a) Where no meter is installed, a monthly charge of	200
(b) Where a meter installed, the charges will be as follows:	
(i) Where the amount of water sold through the meter in any one month does not exceed 10 cubic metres (minimum charge)	200
(ii) Where the amount of water sold through the meter in any one month is more than 10 cubic metres but does not exceed 20 cubic metres, the charge per cubic metre in excess of 10 cubic metres	25
(iii) Where the amount of water sold through the meter in any one month is more than 20 cubic metres but does not exceed 50 cubic metres, the charge per cubic metre in excess of 20 cubic metres	30
(iv) Where the amount of water sold through the meter in any one month is more than 50 cubic metres but does not exceed 100 cubic metres, the charge per cubic metre in excess of 50 cubic metres	45
(v) Where the amount of water sold through the meter in any one month is more than 100 cubic metres but does not exceed 300 cubic metres, the charge per cubic metre in excess of 100 cubic metres	75
(vi) Where the amount of water sold through the meter in any one month is more than 300 cubic metres the charge per cubic metre in excess of 300 cubic metres	100
c) Where water is sold through a meter at a kiosk, the charge per cubic metre	15
d) Where water is sold by retail at a kiosk per unit of 20 litres or part thereof, the charge per	2
e) For the bulk sales to an undertaker for resale, the charge per cubic metre	15
PART II - BOARDING SCHOOLS	Charge
1. A school with a permissible water demand not exceeding 600 cubic metres per month, the charge per cubic metre	20
2. A school with a permissible water demand not exceeding 1200 cubic metres per month, the charge per cubic metre	25
3. Any other learning institution with a permissible water demand of 1200 cubic metres per month, the charge per cubic metre	25
4. The charge per cubic metre of water consumed in excess of permissible water demand	45

Source: Kenya Subsidiary Legislation, 1999: Legal Notice No. 174

The tariffs apply only to those who have formal access to water. Those with no access to water and who acquire water from vendors pay about Ksh10.00 per 20-litre or Kshs. 500 per m^3. This, for all practical purposes, is a very high charge and has a dramatic effect on the household

disposable income. A computation based on the water consumers' distribution and billing in Makindu gives an average billing rate of Kshs. 38.63 per m^3.

10.4 FINANCIAL COSTS OF REHABILITATION

The financial costs for rehabilitation works for Makindu water supply amounts to Kshs.203 million. These are composed of the cost of rehabilitation water supply amounting to Kshs.149 million and that of institutional reform amounting to Kshs.54 million (Table 10.1).

10.5 ECONOMIC COSTS OF REHABILITATION

The economic costs for the rehabilitation of Makindu water supply have been taken to be the total financial costs plus the incremental costs of households to connect to the mains. An average of 950 additional households will be connected at the cost of Kshs.1,500 per household. The resulting additional costs will be Kshs.1,425,000 bringing total economic costs to Kshs.205 million.

10.6 FINANCIAL BENEFITS FROM REHABILITATION

The main benefit of the rehabilitation plan will be institutional strengthening of the town's water supply system. This will result in enhancement of management. The observable outcomes will be increased water supply, reduction of water losses and improvement in the revenue collection efficiency. The benefits will accrue under the following assumptions:

1. The management Consultant is in place at the beginning of Year 1 and involved for it period of 36 months.

2. The distribution network and metering would be rehabilitated/replaced during the first year of the management involvement.

3. Staff levels, remuneration and requirements are as proposed by the recommended Makindu organization chart.

4. The working capital to kick-start the process is available.

5. The appropriate infrastructure to support operations (transport, computers and software requirements and office space) is available.

The benefits will occur as summarized in the following paragraphs.

10.6.1 Revenue from Extra Water Sold

The scheme is designed to produce an average of 480 m^3 per day. It currently produces 406 m^3 per day. Projected demand will reach 1,269 m^3 per day in 10 years. Increased management efficiency with rehabilitation will improve water production to design capacity from the third year of rehabilitation. This will improve water revenues by an average of Kshs.1 million per annum.

10.6.2 Reduction in Unaccounted for Water (UfW)

The average UfW has been determined to be 41.00%. Assuming that the management consultant has the reticulation system replaced/repaired and the billing under control within the first year, this should result in UfW being reduced to 25% during year 1 and 2 and then sustained at a level not exceeding 20% during years 3 – 7, then to 10% during years 8 to 10.

Reduction in UfW will result in revenue improvement averaging Kshs.1.5 million per annum using the current average tariff rate of Kshs.38.63 per m^3 for Makindu.

10.6.3 Improvement in Collection Efficiency

Collection efficiency averages 24.12%. No change is anticipated in the first year. Improved collection efficiency to 87% in year 2 is expected as a result of improved services. The efficiency will change to 95% as the billing system is enhanced through computerization from year 3 to 10.

Improved collection efficiency will improve cash flows by an average of Ksh. 2.4 million per annum.

10.6.4 Improvement in Sewerage Coverage Revenue

No benefits are calculated from this source because Makindu town does not have waterborne sewerage.

10.7 ECONOMIC BENEFITS FROM REHABILITATION

In identifying the benefits, the way to be consistent and accurate is to look at all people conceivably affected by the program and ask how much better off they will be as a result of the expected water and sanitation rehabilitation exercise in the town. In order to give a precise estimation of the social benefits accruing to each individual category, a number of assumptions are made in each approach.

The major focus for this study is on three broad categories of social benefits that are assumed to accrue to the household within a situation of an improved water and sanitation system. These are:

- Social/economic benefits (hereby referred to as opportunity costs) of alternative uses of time previously used for fetching water by the household over along distance.

- Social benefits enjoyed by the household due to better health for water users and their families.

- Social benefits accruing from a reduction in health costs

(1) Valuation of economic benefits of time saved.

The methodology used in the calculation of these benefits is founded on a number of assumptions. These assumptions include:

i. The minimum amount of water required by each household to meet basic sanitary requirement is 100L per day. Therefore at the cost of Kshs 10 per a 20L-jerrican of raw water, they would have to spend an average of Kshs 50 per day on water.

ii. Assuming that the water source is one km away, it means that it would take on average a minimum of 30 minutes per trip to fetch a 20L-jerrican of water. Consequently, to get the minimum daily water requirement of 100L (i.e. 5x20L-jerricans) it would take 2.5 hours.

iii. Assuming that a household earns an average minimum daily wage rate of Kshs 150 for an eight-hour normal working day, it is then possible to calculate the opportunity cost of fetching water in terms of man-hours spent and converting this to money units. The loss is (2.5/8 x Kshs 150) = Ksh.47 per household per day. The annual total loss per household is Ksh.47x365 days = Ksh.17,155.

(2) Economic benefits of better health for users and their families.

In analyzing the benefits accrued to an individual, the study considered the opportunity cost of falling sick due to a water and sanitation-related problem.

Given the health data on Makindu (the study however from the outset acknowledges lapses in data capture), on average, each household losses 50 productive days due to the debilitating effects of water related ailments. Assuming a mean daily average wage rate of Kshs.150 per person per day, it then follows that the total loss per household will be

Kshs.150*50 = Kshs.7,500 per annum. This is the benefit that would accrue to the users with improvement in water delivery.

(3) Economic benefits from reduction in Health costs.

According to the findings of the Welfare Monitoring Survey II of 1994, the budget share of household income spent on health care is 1.8%. Assuming that 80% of this income goes to sanitation related ailments, and given that the average mean monthly household income for Makindu is Kshs.8,520.10, it implies that each household spends Kshs.122.70 on this type of ailments per month. The total expenditure per household in the town is Kshs.122.70 x 12 = Kshs.1472.40 per annum.

(4) Summary of Economic Benefits derived for Makindu Town

Nature of Benefits	Derived Benefits in Kshs Per Household per annum
Economic benefits of time saved from fetching water from source	17,155
Economic benefits of better health for users and their families	7,500
Economic benefits in reduced health cost	1,472
Total benefits per household per annum	26,127

10.8 ABILITY TO MEET O&M COSTS

The water supply will be able to raise enough incremental revenue to cover operating and maintenance costs. The net contribution margin is projected to average Kshs.3.7 million per annum.

10.9 FINANCIAL EVALUATION

Preliminary project evaluation of the proposed Water Supply rehabilitation project should be undertaken in compliance with the financial and economic viability of the project. The overall results of the financial evaluation of Makindu Town Water Supply Schemes are summarized in **Table 10.3.** An average discount rate of about 4%, which reflects the current cost of soft loans to Kenya, is used for the evaluation. The base evaluation is for a period of 10 years.

Table 10- 3 Financial Evaluation Makindu Town Water Supply

Table 10- 3 Financial Evaluation Makindu Town Water Supply					
Financial Evaluation					
FIRR		**NPV**		**RER**	
Rate	**Viability**	**Kshs.**	**Viability**		**Viability**
#NUM!	N/V	(159,133,086)	N/V	0.204	N/V
N/V =		Not Viable			

The results of the financial evaluation given in Table 10.3 indicate that Makindu town water supply is not financially viable, based on the current tariff and a 10-year project life. The NPV of Kshs.(159,133,086) shows that even after rehabilitation of the waterworks the supply will not be able to recover the initial cost of the Investment by year 10.

The financial internal rate of return (FIRR) cannot be determined and is way below the hurdle rate of 4%. The revenue – expenditure ratio (RER) is 0.204 indicating the project is not able to cover its investment costs.

10.9.1 Financial Sensitivity Analysis

It is generally agreed that evaluation a water utility over a ten-year period may be too ambitious. Most water utility investments are expected to indicate positive returns from 25 to 30 years after investment. In this case the project was financially evaluated using the following scenarios:

Case 1: The project is has a life of 15 years

Case 2: The project is has a life of 15 years but costs (Investment + O&M) increase by 15%

Case 3: The project is has a life of 15 years and is financed by Grant

In carrying out the above analysis we assume that the cash flow at the end of year 10 is maintained in the additional periods.

The results of this analysis are presented in Table 10.4

Table 10.4: Financial Sensitivity Analysis Makindu Town Water Supply

	Base Case	Case1	Case2	Case3
	Project has a life of 10 years	Project has a life of 15 years	Project has a life of 15 and Investment Cost and O&M increase by 15%	Case 1 but Project financed by Grant
FIRR	ND	ND	ND	ND
NPV	(159,133,086)	(147,542,673)	(177,012,156)	(148,712,280)
RER	0.2037	0.3120	0.2713	0.3120
	N/V	N/V	N/V	FV
N/V	=	Not Viable		
ND	=	Not Definable		
FV	=	Financially Viable		

The project is not financially viable even when financed by Grant.

10.10 ECONOMIC EVALUATION

The results of the economic evaluations are summarized in Table 10.5, which shows that the rehabilitation costs for Makindu Town Water Supply are justifiable with a fair acceptable economic rate of return. An average discount rate of about 4%, which reflects the current cost of soft loans to Kenya, is used for the evaluation.

The project is evaluated using:

(a) a rate of EIRR (Economic Rate of Return)
(b) a value of NPV (Net Present Value)
(c) a ratio of CBR (Cost Benefit Ratio)

Table 10. 5 Economic Evaluation Makindu Town Water Supply

Table 10- 5 Economic Evaluation		Makindu Town Water Supply			
Economic Evaluation					
EIRR		**NPV**		**CBR**	
Rate	**Viability**	**Kshs.**	**Viability**		**Viability**
5%	EV	3,712,734	EV	0.859	EV

EV = Economically Viable

The project is economically viable with a high EIRR against the hurdle rate of 4%.

The positive NPV value of Kshs.3.7 million makes the project economically very attractive. The project is also able to cover its costs comfortably with a cost-benefit ratio (CBR) of 0.859.

10.10.1 Economic Sensitivity Analysis

An economic sensitivity analysis was performed to determine whether changed circumstances would affect the viability of the project. The following assumptions have been made for the sensitivity analysis.

Case 1: Investment costs increase by 15%
Case 2: O&M costs increase by 15%
Case 3: Both investment costs and O&M increase by 15%

The results of the sensitivity analysis are presented in Table 10.6.

Table 10.6: Economic Sensitivity Analysis Makindu Town Water Supply

Table 10.6: Economic Sensitivity Analysis Makindu Town Water Supply				
	Base Case	Case1	Case2	Case3
		Increase Investment Cost by 15%	Increase O&M by 15%	Increase both costs by 15%
EIRR	5%	0%	4%	0%
NPV	3,712,734	(24,617,700)	2,836,206	(25,494,227)
CBR	0.859	0.984	0.864	0.988
	EV	EV	EV	EV
EV = Economically Viable				

The project is sensitive to change in investment costs.

10.11 Social Evaluation

There is no doubt that society values water due to its effect on social welfare. In this study the two main issues considered were full time availability of clean water and the impact of water on public sanitation and health. Residents in the urban area were requested, through a rapid assessment survey, to specify the relative importance they attach to each of these two aspects.

In all the cases, full time availability of clean water was considered to be of very great importance, with weighting of 94% by residents surveyed. The residents were willing to pay a higher tariff to have availability of water guaranteed. This means that it might be probable for tariff increases to be justified and hence enhance the financial viability of the project.

The residents were quite clear in their minds that clean water impacts positively on public sanitation and health. On health issues, the response indicated that 92% of disease incidences suffered at the local level should be eliminated by the supply of clean water. Again, residents were willing to pay a premium to mitigate against the health effects of non-availability of clean water.

11 IMPLEMENTATION PROGRAMME FOR PROPOSED PLANS

11.1 WATER SUPPLY REHABILITATION

The proposed implementation schedule for rehabilitating the Makindu water supply system is given in Figure 11.1.

The projected duration of each activity is considered to be optimum and is based on experience of similar projects and the proposed scope of the rehabilitation works.

11.2 WASTEWATER AND SANITATION REHABILITATION

There are no recommendations for rehabilitation of the current on – plot sanitation facilities.

11.3 UTILITY MANAGEMENT PLAN

The proposed implementation schedule for utility management plan for Makindu water supply system is given in figure 11.1

11.4 LEGAL AND INSTITUTIONAL FRAMEWORK

The transitional arrangements from the current ownership and operation of the Urban Water Supply to the operations of the Trust Corporation will be structured as follows;

(a) Develop consensus among important stakeholders on the proposed approach to the operations of Makindu Urban Water Supply Service (the Trust Corporation). This is best achieved through a stakeholder workshop.

(b) Appoint members of the Trust from identified stakeholders

(c) Prepare the constituting instrument for Makindu Urban Water Supply Service. This can be done concurrently with activities (a) and (b) above. Registration, however, must await stakeholder consensus. On achievement of consensus on the proposed approach, present the Trust Instrument and registration forms to the Registrar of Trusts at AGs Chambers and ensure registration of the Trust Corporation.

(d) Concurrently with (a), (b) and (c) above, carry out an inventory of the water supply system infrastructure of Makindu Urban Water Supply System. Assign estimated value to these assets. Carry out a valuation of all other assets of Urban Water Supply including equipment, vehicles, furniture, fittings and loose assets.

(e) Develop organisational structures and staffing plans for the new organisation;

(f) Complete the financial plan for the new organisation;

(g) Agree on:

(i) Lease, transfer or sale of infrastructural assets and other assets by GOK and Makindu administration to the Trust Corporation;
(ii) Transfer or recruitment of the existing staff to the new organisation. Agree also on the retirement package or the transfer within the Ministry of staff not absorbed in the new organisation;
(iii) Arrange financial support to the new organisation.

(g) Develop the operations manual for Makindu Urban Water Supply Service;

(h) Ensure all the assets, staff and financial resources are in place in the new organisation (necessary transfers / acquisitions made)

These activities and time frames are illustrated in **Table 11.1**

Table 11.1: Makindu Water Supply Service – Transitional arrangements and time frame.

No.	Activity	Month	1	2	3	4	5	6	7	8	9	10	11	1
1.	Hold consensus building workshop		●	- - -	- - -	- - - ▶	★							
2.	Appoint Board of Trustees		●	- - -	- - -	- - -	- - - ▶	★						
3	Develop and present for registration the Trust Instrument		●	- - -	- - -	- - -	- - -	- - - ▶	★					
4.	Identify and make an inventory of water and sanitation infrastructure assets and estimate their value. Identify and estimate the value of other assets.					●	- - -	- - -	- - - ▶	★				
5.	Develop structures and staffing plans						●	- - -	- - - ▶	★				
6.	Prepare financial plan for the Trust						●	- - -	- - - ▶	★				
7.	Agree on: (i) Lease, transfer or sale of assets (ii) Transfer or recruitment of staff (iii) Financial support					●	- - -	- - -	- - -	- - -	- - - ▶	★		
8.	Develop operations manuals							●	- - -	- - - ▶	★			
9.	Assets, staff and financial resources in place										★			
10.	Makindu Water Supply Service operational											★		

Key:	Event ● - - - ▶	Event deadline ★

11.5 FINANCIAL PLAN

11.5.1 Business Plan

The summarized business plan for Makindu town is given in Table 11.2. The specific feature of interest is that the utility will be able to fully cover its operating and maintenance costs. The achievements of the predictions indicated in this business plan are strictly contingent upon there being the appropriate institutional framework for the town. This will call for a change in management style and structures that will facilitate the delivery of the set intent.

11.5.2 Financing Plan

It is assumed that the rehabilitation costs will be composed of four components: Institutional Strengthening, Professional Input for works, Water Supply and Sanitation. These financial costs of the project are assumed to be incurred as follows:

Table 11-2: Financing Plan Makindu Town Water Supply

Years	1	2	3	4	Total
	Kshs	Kshs	Kshs	Kshs	Kshs
Institutional Development Costs	10,780,000	14,520,000	14,520,000	14,520,000	54,340,000
Consultancy Fees for Works (20% of works)	7,452,000	12,420,000	4,968,000	-	24,840,000
Water Supply Rehabilitation	37,260,000	62,100,000	24,840,000	-	124,200,000
Sanitation Rehabilitation	-	-	-	-	-
Total Overall Project Cost	**55,492,000**	**89,040,000**	**44,328,000**	**14,520,000**	**203,380,000**

The total cost of rehabilitation is Kshs.203 million approximately. These costs are spread over a four-year period.

The working capital and the institutional set-up costs must be availed at the beginning of the rehabilitation plan.

It should be noted that the financial evaluation has been based strictly on the cost of rehabilitation.

Table 11.2: BUSINESS PLANS Makindu Town Water Supply

CASH FLOWS

Year	1	2	3	4	5	6	7	8	9	10
REVENUE GENERATED										
Revenue from Extra Water Sold	626,038	730,377	1,043,396	1,043,396	1,043,396	1,043,396	1,043,396	1,043,396	1,043,396	1,043,396
Revenue from Unaccounted for Water	915,933	915,933	1,202,162	1,202,162	1,202,162	1,202,162	1,202,162	1,488,391	1,488,391	1,488,391
Savings from Collection Efficiency	-	2,093,263	2,359,581	2,359,581	2,359,581	2,359,581	2,359,581	2,359,581	2,359,581	2,359,581
Revenue from Sewerage Charges	-	-	-	-	-	-	-	-	-	-
Total	1,541,971	3,739,573	4,605,139	4,605,139	4,605,139	4,605,139	4,605,139	4,891,368	4,891,368	4,891,368
Expenditures (Kenya Shilling)										
Transport & Staff Related Expenses	277,555	673,123	828,925	828,925	828,925	828,925	828,925	880,446	880,446	880,446
O&M	308,394	747,915	921,028	921,028	921,028	921,028	921,028	978,274	978,274	978,274
Postage	5,859	14,210	17,500	17,500	17,500	17,500	17,500	18,587	18,587	18,587
Telephone	14,032	34,030	41,907	41,907	41,907	41,907	41,907	44,511	44,511	44,511
Purchase of meters	25,288	61,329	75,524	75,524	75,524	75,524	75,524	80,218	80,218	80,218
Stationery	16,807	40,761	50,196	50,196	50,196	50,196	50,196	53,316	53,316	53,316
Fuel & Gas	77,870	188,848	232,560	232,560	232,560	232,560	232,560	247,014	247,014	247,014
Current O&M Costs	(1,264,846)	(1,264,846)	(1,264,846)	(1,264,846)	(1,264,846)	(1,264,846)	(1,264,846)	(1,264,846)	(1,264,846)	(1,264,846)
Incremental O&M Costs	**(539,040)**	**495,371**	**902,793**	**902,793**	**902,793**	**902,793**	**902,793**	**1,037,521**	**1,037,521**	**1,037,521**
Sulplus(Deficit)	**2,081,011**	**3,244,202**	**3,702,346**	**3,702,346**	**3,702,346**	**3,702,346**	**3,702,346**	**3,853,847**	**3,853,847**	**3,853,847**
Average Tariff (Kshs/m3)	38.63	38.63	38.63	38.63	38.63	38.63	38.63	38.63	38.63	38.63
Investment Costs										
Net Cash Flow	**2,081,011**	**3,244,202**	**3,702,346**	**3,702,346**	**3,702,346**	**3,702,346**	**3,702,346**	**3,853,847**	**3,853,847**	**3,853,847**
Cumulative Cash Flow	**2,081,011**	**5,325,213**	**9,027,559**	**12,729,905**	**16,432,251**	**20,134,597**	**23,836,943**	**27,690,791**	**31,544,638**	**35,398,485**

12 CONCLUSIONS AND RECOMMENDATIONS

12.1 WATER SUPPLY REHABILITATION

12.1.1 Operational performance of existing system

The operational performance of the existing water supply system is acceptable but there is room for improvement once the basic infrastructure is rehabilitated as recommended in this report. The supply to Makindu town and its environs depends solely on pumped arrangements and it is considered vital that the transmission capacity and reliability is guaranteed under the proposed rehabilitation works. Storage volume is of critical importance in a pumped supply system and this is reflected in the proposal to immediately expand storage tank installations.

There is no bulk metering of the treated water at the intake facility and accurate production figures are not available. It is therefore essential that a bulk meters be installed during rehabilitation works.

The quality of water delivered within the distribution system has a direct bearing on the health and welfare of the Makindu population. It is therefore critical that sampling and water analyses are continuously monitored. Laboratory facilities will be rehabilitated, equipped and stocked immediately and suitable members of staff identified for training as laboratory technicians. A schedule of tests will be prepared (daily, weekly, etc.). Physical tests will be carried out on site at the treatment works and, in the absence of suitable equipment, samples of raw and treated water will be sent periodically to Nairobi for bacteriological analyses.

Water is rationed in Makindu which would indicate that a high percentage of volume produced is lost as unaccounted for water(UFW).

Installation of zonal bulk meters in the distribution network will greatly assist in identifying major causes of leaks and in monitoring UFW.

12.1.2 Recommendations for rehabilitation requirements

The recommended rehabilitation measures with preliminary cost estimates are summarised in table 12.1

The total cost estimate for rehabilitation works is Kshs 149,040,000. This estimate is inclusive of preliminary and general items, contingencies and consultancy fees.

12.1.3 Future expansion

The estimated value of the proposed expansion works is Kshs 203 million (including preliminary and general items, contingencies and consultancy fees).

Table 12.1: Cost estimate for rehabilitation works for Makindu water supply

Description	Unit	Quantity	Rate (KShs)	Amount (KShs)
Intake works site facilities and raw/treated water pumps				
New intake chamber, raised pump station structure& store	Sum			2,000,000
Allow for extension to power mains	Sum			1,750,000
New 30 HP electrical pump set	nr	1	1,500,000	1,500,000
New standby 30 HP diesel engine and pump set	nr	1	2,000,000	2,000,000
Allow for addition and modification to existing control panel	Sum			400,000
Refurbish staff houses and new septic tank	Sum			1,200,000
subtotal				***8,850,000***
Water treatment and rising main				
Replace in-line chlorination facility	Sum			1,200,000
Replacement and realignment of rising main with 100 mm diameter GI pipe	m	3,820	10,000	38,200,000
Aerial crossing along rising main	m	180	15,000	2,700,000
subtotal				***42,100,000***
Access road to intake				
Rehabilitate at mudholes and grade with earth drain	Sum			4,500,000
Construct drift with 450 mm diameter culverts at river crossing	Sum			1,750,000
subtotal				***6,250,000***
Distribution system				
New 500m^3 elevated storage tank on 12m high tower plus site works	Sum			7,500,000
Rehabilitation and augmentation of ND 50 to 150mm uPVC distribution pipework	m	3,000	2,500	7,500,000
New bulk water meters, AVs, NRVs, SVs, etc	Sum			4,500,000
Laboratory equipment and materials	Sum			1,750,000
Tool kits	nr	2	250,000	500,000
subtotal				***21,750,000***
Logistical facilities and equipment				
New office and laboratory building facilities	m^2	150	25,000	3,750,000
4WD twin-cab pickups	nr	2	2,500,000	5,000,000
Motorcycles	nr	3	250,000	750,000
Multi-geared mountain bikes	nr	2	25,000	50,000
Desk top computer setups	nr	2	200,000	400,000
Printers	nr	2	100,000	200,000
Licensed standard computer software	Sum			300,000
Standard office equipment, furniture and fittings	Sum			600,000
subtotal				***11,050,000***
Overall Total				**90,000,000**
Add 20% P&G				18,000,000
sub-total				***108,000,000***
Add 15% Contingencies				16,200,000
sub-total				***124,200,000***
Add 20% consultancy design fees				24,840,000
GRAND TOTAL				**149,040,000**

12.2 SANITATION REHABILITATION AND FUTURE EXPANSION

With the anticipated rise in population of Makindu and the peri urban areas which depend on its water supply, there will be added pressure to develop a centralised sewage collection and treatment facility. Until population densities and plot sub-divisions reach such critical levels, the current on – plot sanitation facilities are deemed to suffice with plot owners being encouraged to design and construct VIP type pit latrines to approved standards.

12.3 LEGAL AND INSTITUTIONAL FRAMEWORK

Makindu water supply, like the other nine towns covered in this study, is served by the Ministry of Environment and Natural Resources. The water operator is the District Water Officer (DWO).

In recommending a viable institutional and legal framework for Makindu Urban water Supply, the following guidelines were utilized: Government policy on the water sector Government policy on the restructuring and privatisation of public enterprises and the eligibility criteria for grant funding within the sector by Government of Japan. Other considerations include; sustainability of water supply and sanitation services; improved access to community, especially women; community participation and involvement; speed of incorporation in view of current strict deadlines and consistency with existing incorporation laws; - public orientation as opposed to private sector orientation.

The legal framework for water sector management in Kenya include: The Water Act, Cap. 372; The National Water Policy set out in Sessional Paper No. 1 of 1999; and the National Water Master Plan. The institutional framework for the water sector involves: the Ministry of Environment and Natural Resources; the National Water Conservation and Pipeline Corporation; the five River Basin Development Authorities; private sector operators and non governmental organisations;

12.3.1 Options for Makindu Urban Water Supply

Applying these guidelines, various institutional and legal options for Makindu Urban Water Supply were listed and expounded upon. They were:

(a) State corporation
(b) Limited liability company
(c)Co-operative society
(d) Trust corporation

After weighing the advantages and disadvantages of each option, and evaluating their conformance with Government of Kenya and JICA requirements, the formation of a Trust Corporation for Makindu Urban Water Supply Service was proposed as the best option.

12.3.2 Legal Requirements And Institutional Framework For A Trust Corporation

The legal requirements for creating the proposed Trust Corporation for Makindu Urban Water Supply Service were outlined, together with an institutional framework. The following two structures were recommended:

(a) A Board of Trustees (BOT)

The Board of Trustees will be the governing body of the Trust Corporation. It will acquire and manage assets on behalf of the stakeholders; and will be responsible for policy guidance and the strategic direction of the Trust Corporation. The proposed Board of Trustees will be appointed from the current stakeholders of Makindu Urban Water Supply.

(b) Management structures

The Trust can operate the water supply and sewerage system in the Town or alternatively, the Trust can contract out this function to a private operator. In the event the BOT decides to manage these services, it can appoint senior members of the Management Team.

These are:

(a) The General Manager
(b) The Technical Manager
(c) The Commercial Manager

12.3.3 Implementation and recommended institutional form.

The transitional arrangements from the current ownership and operation of the Urban Water Supply to the operations of the proposed Trust Corporation were outlined. The arrangements were:

Developing consensus among important stakeholders on the proposed approach to the operations of Makindu Urban Water Supply Service (the Trust Corporation); appointing members of the Trust from identified stakeholders; Preparing the constituting instrument for Makindu Urban Water Supply Service; carrying out an inventory of the water supply system infrastructure of Makindu Urban Water Supply System and assigning values to these assets; developing organisational structures and staffing plans; completing the financial plan for the new organisation; agreeing on transfer modalities; developing an operations manual for Makindu Urban Water Supply Service; and ensuring all the assets, staff and financial resources are in place in the new organisation.

12.4 OVERALL FINANCIAL AND ECONOMIC EVALUATION

Table 12.2 Makindu - Overall Financial and Economic Evaluation (Without Sensitivity Analysis)

Financial Evaluation			Economic Evaluation			Social Concerns		Overall Evaluation
FIRR	NPV	RER	EIRR	NPV	CBR	Health needs	Water needs	
N/V	**N/V**	**N/V**	**V**	**V**	**V**	**V**	**V**	**ESV**

N/V = Not Viable
V = Viable
ESV = Socio-economically Investment Justifiable

Table 12.3 Makindu - Overall Financial and Economic Evaluation (With Sensitivity Analysis)

Financial Evaluation			Economic Evaluation			Social Concerns		Overall Evaluation
FIRR	NPV	RER	EIRR	NPV	CBR	Health needs	Water needs	
N/V	**N/V**	**N/V**	**V**	**V**	**V**	**V**	**V**	**ESV**

V = Viable
ESV = Socio-economically Investment Justifiable

12.4.1 Financial Evaluation

The project has been assessed not to be financially viable under current tariff regime if a 10-year or 15-year period is used.

12.4.2 Economic Evaluation

The project is economically viable. It is nevertheless sensitive to change in investment costs.

12.4.3 Social Evaluation

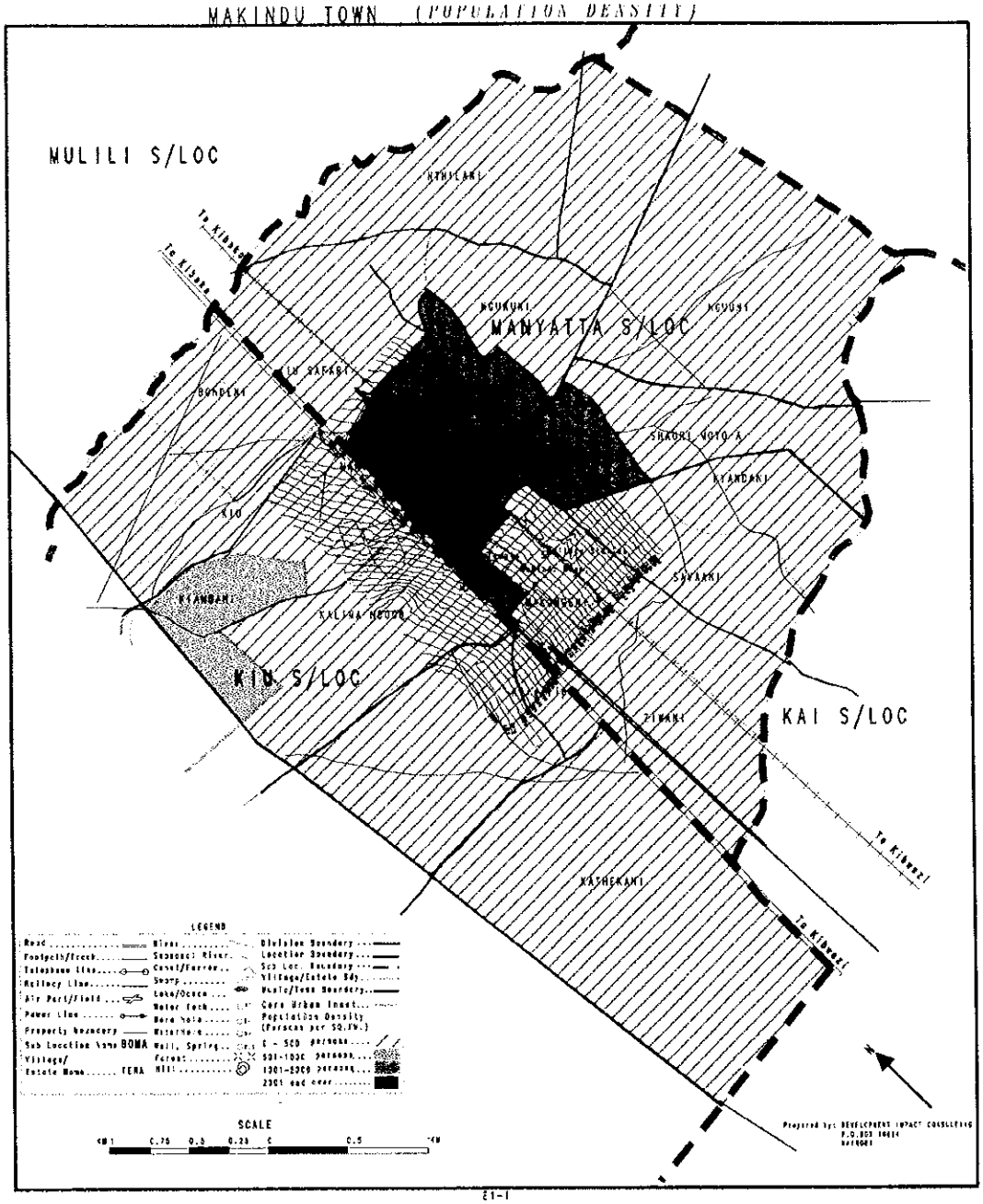
It was found that 92% on average of the residents consider supply of clean water a higher priority that other social infrastructure. They would also be willing to pay a higher tariff to obtain the social benefits arising from a clean and constant water supply system. The project is therefore socially justified

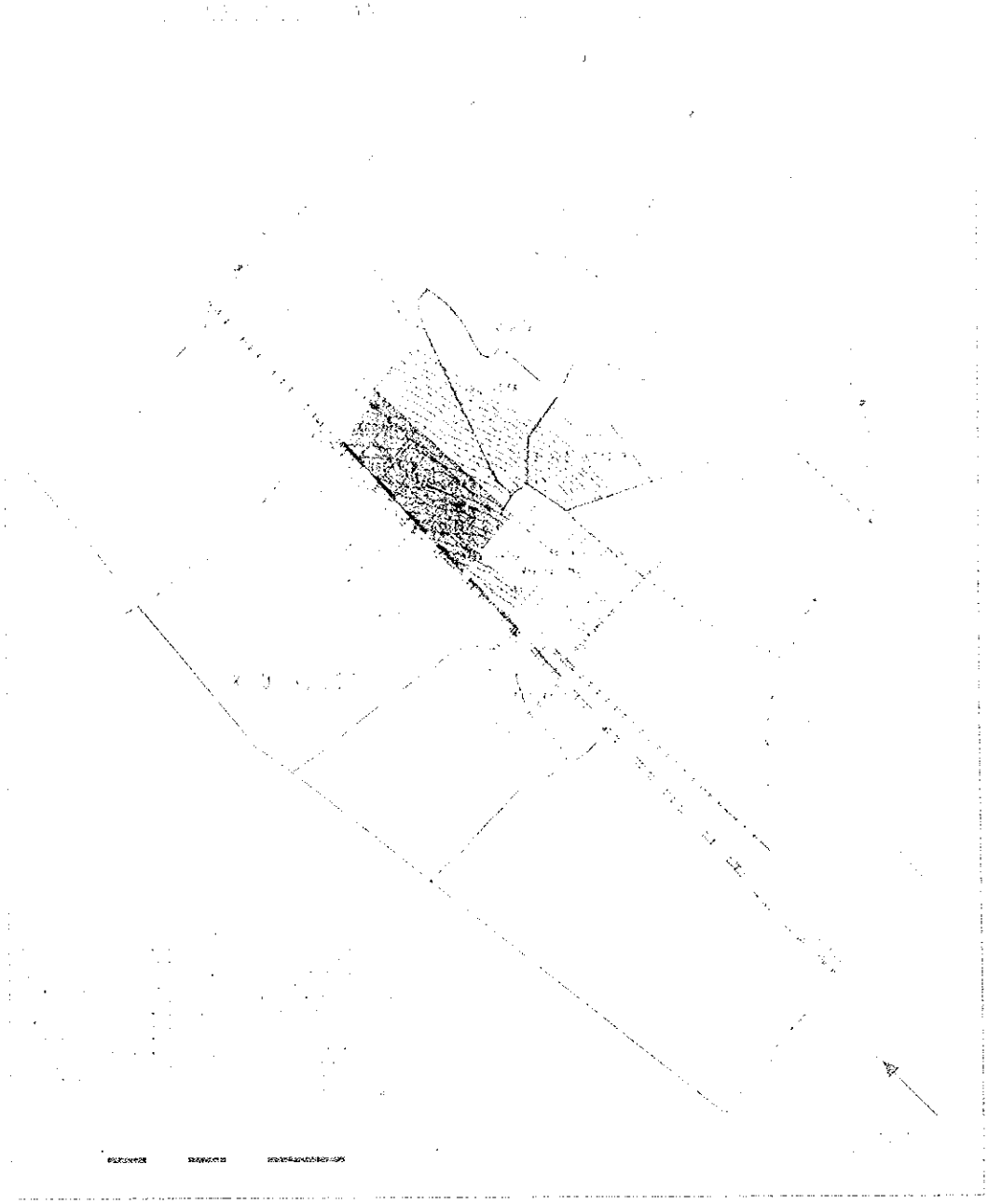
12.4.4 Overall Evaluation

The project is socio-economically justified as provided in Table 12.3

APPENDIX E1
MAKINDU TOWN

MAKINDU TOWN (POPULATION DENSITY)



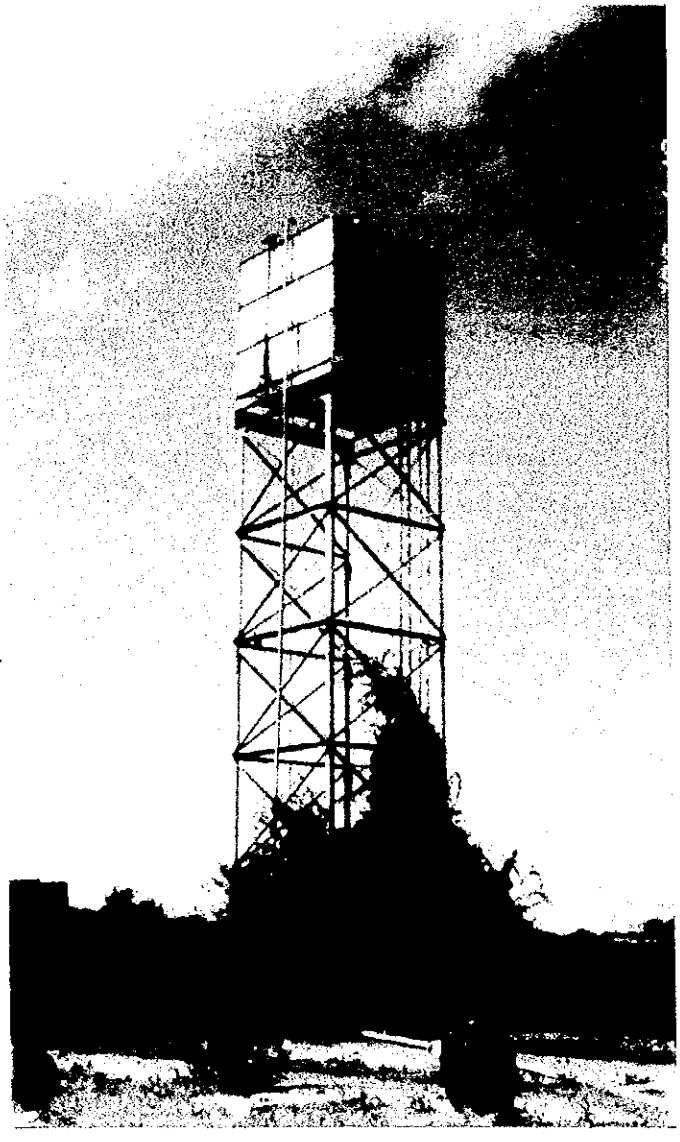


E1-3 1999 POPULATION DATA FOR MAKINDU TOWN

LOCATION	SUB-LOCATION	AREA	NO. OF HOUSEHOLDS	MALE	FEMALE	TOTAL
MAKINDU	MANYATTA	NGUUNI	14	23	39	62
		SHAURI MOYO 'A'	31	77	90	167
		SHAURI MOYO 'B'	163	257	301	558
		KYANDANI	60	151	168	319
		SAVAANI	79	195	199	394
		ZIWANI	33	119	103	222
		KIU SAFARI	23	62	66	128
		MANYATTA	304	493	479	1623
		NGUKUNI	58	145	129	274
		MAKONGENI	844	1235	1264	2499

APPENDIX E2
MAKINDU TOWN

ACCESS ROAD TO INTAKE SITE AT RIVER CROSSING



50m^3 ELEVATED STORAGE TANK
AT RAILWAY STATION SITE

APPENDIX A2 - ENGINEERING PRINCIPAL DESIGN CRITERIA

The following principal design criteria are used, with reference to the appropriate sections of the 1986 Design Manual prepared by the Ministry of Water.

(a) Water quality

(i) Bacteriological quality of water

No faecal coliforms (1986 Design Manual, section 5.2.2, subsection A.1). Following the 1994 WHO guidelines for drinking water quality, this can be achieved by disinfection:

- with a free chlorine residual of 0.5 mg/l (8.12.4 of the 1986 Manual gives 0.3 mg/l to 0.5 mg/l);
- at a pH less than 8, and
- a turbidity less than 1 NTU;
- for at least 30 minutes.

Section 138 of the draft Water Act states:

"All water undertakers must ensure that any water for human consumption shall be disinfected using approved disinfectants and the required residual levels maintained at the reservoirs, distribution lines and end points."

The word "any" means that all potable water must be disinfected, even groundwater. The word "residual" implies that the approved disinfectants will be limited to chlorine compounds or other halogens. It would not cover UV radiation, ozone, etc.

(ii) Chemical quality of water

- Fluoride to be less than 1.5 mg/l, or 3 mg/l in exceptional cases (1986 manual, section 5.3.1).
- Colour to be less than 15 TCU (5.3.2) or up to 50 TCU in exceptional cases (5.3.3).
- Turbidity to be less than 1 NTU for disinfection (1994 WHO guidelines).
- pH to be between 6.5 and 8.5 (5.3.2) or up to 9.2 in exceptional cases (5.3.3), but less than 8.0 during disinfection (1994 WHO guidelines).

- Iron to be less than 0.3 mg/l (5.3.2), or 1.0 mg/l in exceptional cases (5.3.3).
- Manganese to be less than 0.1 mg/l (5.3.2), or 0.5 mg/l in exceptional cases (5.3.3).
- Water should not attack concrete or ferrous products (5.3.4). This requirement imposes further limitations on pH.

(b) Treatment

(i) General

The works should be designed for continuous operation (8.1.4).

(ii) Pre-settlement

Section 8.4.1 of the 1986 Design Manual recommends pre-settlement ahead of slow sand filters when raw water turbidity is between 20 and 100 NTU. Pre-settlement tanks may also be used ahead of clarifiers when the turbidity exceeds 1,000 NTU.

(iii) Aeration

Not required for surface waters (Section 8.6.1). May be required for groundwater (8.6.2) to be followed by sedimentation or filtration when carried out to oxidise iron and manganese.

(iv) Treatment chemicals

Coagulant	:	aluminium sulphate (8.7.4)
pH correction	:	soda ash (8.7.4)
Disinfectant	:	tropical chloride of lime or calcium hypochlorite (8.12.2)

(v) Sedimentation

Section 8.9.3 of the 1986 Design manual requires horizontal flow tanks with a design surface loading of 1 m/hr.

Section 8.9.4 states that the operational requirements of vertical-flow, sludge blanket clarifiers are so strict that they should not be used except under very exceptional circumstances.

(vi) Rapid gravity filtration

The principal criteria for rapid gravity filters are:

- design surface loading to be 5 m/hr (8.10.1);

- filter bed thickness 0.7 m to 1.0 m (8.10.2);
- filter media to be quartz sand, 0.5 mm to 1.0 mm, with a uniformity coefficient less than 1.5 (8.10.2);
- backwash rate to be 50 m/hr minimum (8.10.4);
- air scour only in exceptional cases (8.10.4).

(vii) Chemical dosing for disinfection

The World Health Organisation recommends that water intended for potable use should be disinfected with 0.5 mg/l of free available chlorine for at least thirty minutes at a pH less than 8. This recognises that germicidal efficiency is dependent on both the free chlorine concentration and the time of contact.

To achieve a free chlorine residual, sufficient chlorine must be dosed to react with any dissolved ammonia, iron, manganese, etc. The required doses are:

- 7.6 g of chlorine to react with 1 g of ammonia;
- 0.54 g of chlorine to react with 1 g of ferrous iron, and
- 1.5 g of chlorine to react with 1 g of manganese.

(c) Transmission systems

Transmission systems should be designed for:

- twenty-four hour operation (implied in 12.7.1 for clear water pumps, explicit in 12.7.2 for raw water pumps and 12.7.3 for borehole pumps);
- one standby pump (12.8.1);
- diesel generators to provide 50% cover (12.8.2);
- a minimum head of 4 m in the transmission main (9.3.7).

(d) Storage

Section 11.3.1 of the 1986 Design Manual requires balancing storage to be fifty per cent of the daily demand. Section 11.3.2 requires the following emergency storage:

- 12 hours for gravity supply to storage;
- 18 hours for pumped supply;
- 8 hours for supplies from more than one independent system.

(e) Distribution

The principal criteria are as follows:

Minimum head at consumer connections to be 10 m;
Maximum head generally not greater than 60 m.

(f) Water demand in urban areas

People with individual connections	high class housing	250lcd
	medium	150
	low	75
People without connections	low	20

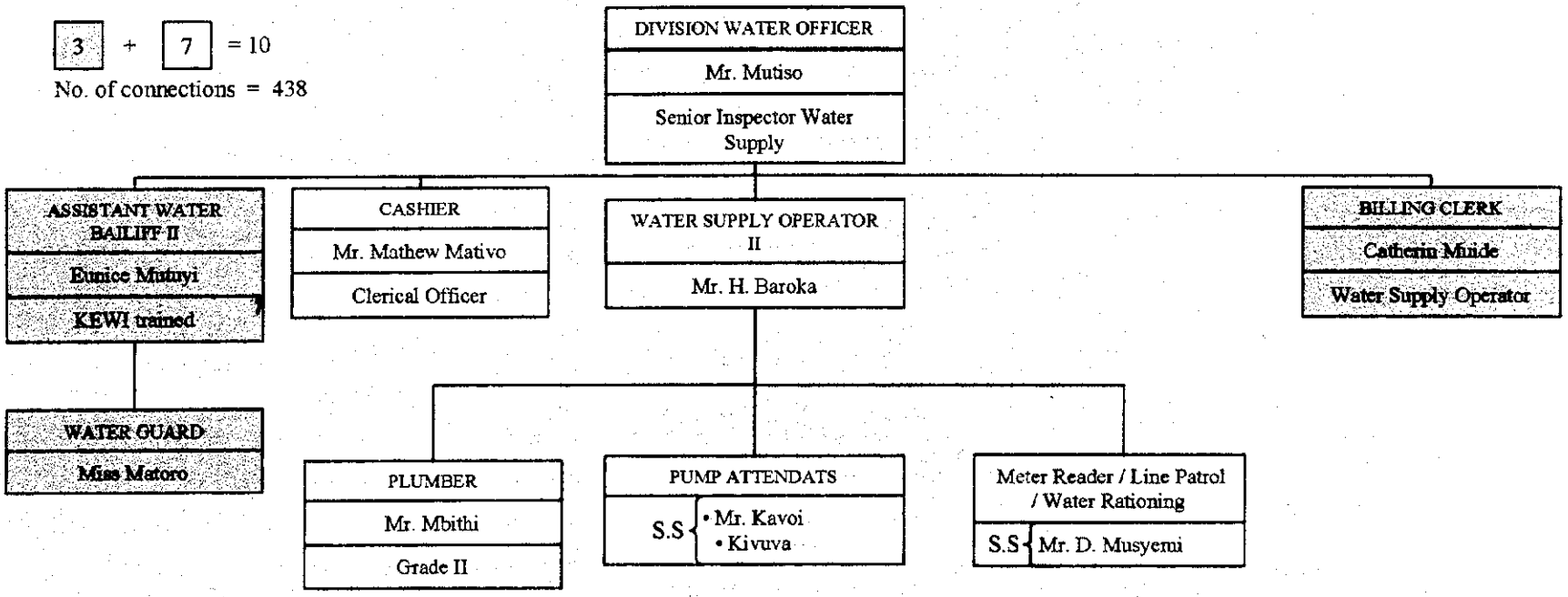
APPENDIX E3
MAKINDU TOWN

MAKINDU

MAKINDU WATER SCHEME ORGANISATION CHART

FIGURE: 8.1.5

STUDY OF INSTITUTIONAL IMPROVEMENT ON REHABILITATION OF WATER SUPPLY SYSTEMS FOR TEN(10) LOCAL TOWNS IN KENYA



Development Impact Consulting

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LAWGIBB Group Member

Gibb Eastern Africa Ltd.

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CONSORTIUM

Study of Institutional Improvement and Rehabilitation of Water Supply Systems for Local Towns in the Republic of Kenya

Location: Makindu WS&S System DIVISION
Date: 23.-25.10.2000

Interviewer: LEK and CK

Discussion/Interview with: Divisional Water Officer: Mr. Steven Mutiso
Billing & Revenue Clerk: Katherine .....

And Officer in Charge of O&M at District Level Wote: Mr. Eric Moki
Tel. Wote office: 0144-33389

Mr. Moki had been the Divisional Water Officer for Makindu for nine years before he was transferred t the District office

No telephone, message through Wote office

Makindu office:
P.O.Box 188
Makindu

Note: Securicor does not deliver parcels there, as no office there

No.	Question:	*Answer:*
A.	**Utility System**	
1.	**Office Set-up**	
	Office space?	*4 offices (incl. 1 store)for Billing,DWO,Cashier*
	Office equipment?	*NIL, even stationary is bought by DWO, then refund claim*
	Tel.lines?	*C.O.N.P. 4 yrs ago use call box and reverse call facility*
	Fax?	*No*
	E-mail?	*No*
	Reliable Power supply?	*No power connected, but line next to office*
	Rationing?	*N/A*
	Other comments?	*2 personal calculators*
	Hardware, Software and skill: separate questionnaire !!	*N/A*
2.	**Staffing Set-up**	
	Total number of staff?	*10 (2 retrenched: Mason,Surface Water Assistant)*
	Male/Femal ratio?	
	Fluctuation? Due to?	
	Average years within the system?	*perhaps 3-4 yrs, then "things" happen and they are transferred to other stations*
	Orga chart in place?	*No*
	Job description available?	*They say yes, but nothing available and mixed up with a discription available for the job category they are in*
	Level of skill?	*Yes, on technical level*
	Overdue staff promotion?	*Not seen any promotion in the last 9 years, apart from one Inspector to Senior Inspector*
		Forms are filled every year, but nothing happens
	Training facilities offered?	*N/A*
	Used facilities?	
	Technical Administration Management	*??????????*
	Qualification Station Manager	
	Recruitment statistics	*Only when people are transferred, they ask for replacement*
	Remuneration and benefits	*Refer to HQ*
3.	**Transport and Logistics**	
	Cars? Which? Number:	*Nil*
	Motorbike? Which? Number:	*1 Yamaha 125, grounded and 10 yrs old (they borrow from German Agr Action if possible)*
	Bicycle? Number:	*1*
4.	**Institutional Frame**	
	MENR: Line of command	*Everything through District Water Office in Wote, approx. 65 km away, Matau fare 250-300 Kshs*

B.	Utility Indices	
1.	**Billing** **Consumption Actual vs Estimate**	*Refer to Table 8.2.5*
	Consumption Billed per month	
	Consumption Billed for the last 3 years	
	Billing Efficiency: Water billed/ Water supplied	*Refer to Table 8.2.5*
	Billing Effectiveness: How many out of 100 bills are wrong or returned for reason	
2.	**Revenue & Collection** **Revenue Billed vs Revenue Collected per month**	*Refer to Table 8.3.5*
	For the last 3 years monthly and annual figures	*Available for the period July 99 to June 2000*
	Collection efficiency: Total billed/ Total collected	*Not calculated but refer to Table 8.3.5*
3.	**UfW** **1 - Recorded consumption/Production (supply efficiency) per month** **Or production vs billed consumption**	*Refer to Table 8.2.5 calculated average from Jan,2000 to June 2000 is 18.90 %*
	For the last 3 years, monthly and annually	*Not available*
	Value of UfW: **loss x average tariff rate of system per month** **2000:**	*Not calculated as available records are very uncertain.*
	1999:	
	1998:	
4.	**Tariff**	
	What is the average tariff rate per cbm? **Total billed water/Total water**	*Can not be calculated with available records*

	supplied Tariff structure? Current Last 3 years: Additional charges? Additional sources of income?	*In line with gazette, when flat rate, they assess, but flat rate only on KR accounts* *Meter Test*
5.	Funding Required Funding per month? Salary Procurements Power Chemicals Others	*64 % A.I.E. based on total Revenue Collected* *Meter Test: 100.00 Kshs*
6.	Cost Total per month Salary Power O&M Administration Others	*Not available*
7.		
8.	Debt Arrears Debt Arrears Situation in Kshs Increase per month Total FY 99/00 98/99 97/98 Debtors Totals/Billed Revenue Debtors Totals/Collected Revenue	*Refer to table 8.3.5. Comment available is that Kenya Railways is a major contributor to the debt as they do not pay(used to run the system,no clear details on ownership)* *Not calculated as figures uncertain*
C.	Utility Procedures	
1.	Staff Recruitment	*No procedure, as staff asked for in replacement for transferred staff*
2.	Defaulters Handling Illegal consumption	*Disconnect from the main T, if suspected that illegal re-connection* *If they know from when illegal consumption, they calculate and assess, call the consumer and demand payment* *Last month 2 consumers paid 3,000 Kshs: Consumer had done a bypass* *and 3,015 Kshs: consumer had removed meter after meter reading and fixed before next meter reading*
3.	Administration Are debtors maintained monthly? Is an aging analysis available? Debtors lists for different Consumer categories?	*No* *No* *No*

	Accounting **Manual or computerised? If manual elaborate:** **Double Book keeping done** **Ledger cards**	*Manual* *No* *Everything at Wote*
4.	**Funding**	*Procurement provided through Wote* *A.I.E. procedure* *No imprest and the Divisional WO has to pre-finance on pressing needs* *Additional assistance from NGO's(GAA and Amref)*
5.	**Installment Payment**	*No*
6.	**Meter Reading & Billing:**	*Meter reading commences on 24th of every month* *2 MR go into the field with a plain piece of paper, they know their accounts by heart. Meter location known to MR and Div.WO* *Reading for 3 days each, one on Upper Zone, one on the Lower Zone. Railway line is the separating line.* *Connection in the consumer ledger:* *IN 04 L12 168* *Institution / Zone / distribution line / account number* *In most cases missing* *Only for the old Kikumbuli* *Supply line* *Coming from the field, information is transferred into the Meter Reading books. Problem when old MR books transferred into new ones, they are partly split into upper and lower zone, and when transferred, then only the name is transferred, other vital information is missing..* *Bills issued on plain paper, cut and given to consumer with stamp only. Only institutions get a bill !!*
	New Connection	*DWO does survey and connection to ensure quality control.* *Consumer has to provide a new meter and no meter rent is charged. Changed in 1993/94* *3,500.00 for new meter* *200.00 for labour*
7.	**Disconnection**	*Failure to pay within 3 months, a cut-off list is prepared by billing clerk.* *Division Water Officer usually requests for the list. However the actual disconnections are very few because consumers are alerted before the exercise and are given chance to pay. This results in loss of reconnection fee.*
	Burst Repairs	*Materials have to be requested for through District office. If too long delayed or emergency, they approach GAA or community system for help.* *There is nothing else to do*
	Network Appurtenances Attendance / Repairs	*They try when there is a problem*

8.	Meter Servicing	*As from July2000 they gave consumers 3 months notice, that their meter is not moving and needs service. The service has to be paid for.* *Consumer comes to the office, because if they do not come, they are given notice of disconnection.* *Plumber services on site. Consumer requested to buy a new one if the old meter cannot be repaired!!*
9.	HQ Reporting	*Reporting to the District office in Wote, in line with monthly report, submitted monthly*
10.	Procedure Manuals	*Not available*
11.	Financial Control	*Consumer payments:* *Original Receipt -> Consumer* *Copy Receipt -> District Water Accountant* *Copy Receipt -> Office file. Collector from District Water Office comes without notice* *Cheques only from Makindu Hospital* *The cashier prepares form FO 17 to surrender all monies collected from the consumers. Wote District Water Office sends revenue collector to Makindu, checks the money, issues a receipt to the cashier and later surrenders to the District Treasury.*
12.	Cash/Cheque Un-accounted for cash advances? Consumer payments into consumer accounts? Cash/Bank book maintained and up to date?	*No imprests* *Payments are made at Makindu Division Office and the amount paid is then inserted in the consumer ledger by the billing clerk* *Problem of lack of receipt books result to sending consumer away with money.* *No, not required*
13.	Reconciliation For Cash? For Bank?	*Not done* *Cash and cheques collected are later handed over to the revenue collector who comes regularly from Wote District Water Office.*
D.	Discussions	
1.	Staff Awareness of operation and financing cost vs turnover? Job satisfaction and expectation? Existing constraints? Physical Financial Institutional Political	*No* *Ok, but constraints* *Yes, many* *No transport at all, only borrow motor bike from GAA if possible* *Zero imprest , but upto 95/96 they got* *Delays for everything* *Minimal, but during barasas politicians like to criticise the staff*

	Personnel **Efforts made to overcome the constraints?** **Consumer relationship?** **Relationship with DWO?** **Relationship with Ministry?** **Relationship with LA? Planning Department?** **With other utility providers?** **External influence affecting the performance?** **Working environment?** **What is the opinion about PSP?**	*DWO uses his own money only to be refunded much later* *Borrow pipes from GAA, or diesel from Hospital* *Only when material or special problem, or when called to the District. Before they had meetings, now No, because of financial constraints. Since 1995/96 situation has gotten worse* *Only personnell issues* *No,the only connection is that all councillors from the 4 locations fall under the County Council Makueni, but all located in Wote. In Makindu only collectors and sweepers!!* *No* *Leaking high level tank could be repaired with 8,000.00 Kshs, but instead of money they would ask for other help, because of fear that politicians might use it against them.* *Only the financial problems, otherwise it would be ok. Imagine you are called to take care of the next division, while the colleague is on leave, but there is no transport, neither money to get transport, i.e. one is expected to use his own money to look after the next division ?!* *Welcome* *Recommended:* 1. *Salary up by 300 %* 2. *Have transport and tools* 3. *Imprest to – hire vehicle if neede, get casuals, transport* 4. *Allow procurement from within, i.e. let people who are supposed to use those procurements be involved for quality control. When Amref line was done, Divisional Water Officer was there when procurement was done to check that material complies with what had been quoted for* 5. *Allow autonomy to a certain ceiling*
2.	**Consumers** **Comments on:** **Reliability** **Quality** **Billing** **Price** **Consumer requests on:**	*No discussions held*

	Coverage **Reaction Time** **Proposed changes** **Service rating** **Cost in relation to service provided?** **Tapped vs kiosk?** **View and understanding of PSP?** **What does the consumer expect?** **What does the consumer propose?** **What is his/her situation on rationing?**	
3.	**Stakeholders**	*No discussions held*
4.	**Community Projects:**	*Kikumbuli Community: (136 (ref. Table8.1.6) accounts taken over in 1992)* *Connections which were originally supplied from the 3" line, off the 4" raising main between pumping station and main reservoir, were separated from Makindu WSS, because they received water from Umani Springs. No information how it is managed.* *Kai Water Project: -operational since 7 months* *Serves sub-location with approx.: 3.800 people* *Financed by Amref, trained by MENR staff (artisans,books)and training included formulation of the by-laws* *5.5 km line of size 4",3"and 2", 3 tanks of 25cbm each and 3 water kiosks.* *2" master meter to control consumption.Stalls at times, but record keeping of the committee is very good and is then used for billing purpose of the Makindu WSS staff.* *Community has bank account with money. Chairman is lecturer at University with interest in the supply as area extremely dry, Committee has 3 women members. Maintenance of the line is responsibility of the community, no problems so far. Chairman and artisans were cleaning one tank when visited (without being informed in advance), daily meter reading book was up-to-date.* *No arrears on payment to Makindu WSS* *Artisans and Kiosk attendants are from within the community and receive salary for the work they do. Operator gets 1,200.00 Kshs per month.* *Treasurer receives money daily, banks weekly.* *Supply is restricted to the community until the raising main is rehabilitated, which is manifested in the By-Laws. Currently rationed but such, that the tanks are sufficient for the community until next supply flows.* *Community plans to use the money on the account for maintenance and to reach further (Primary school another 3 km away).*

		Amref conditions were the involvement of the community in trenching and laying of the pipes, construction of the tanks for which the trained artisans from within the community were used. *Pricing: 20 liter sold at 2 Kshs, while charged 0,50 Kshs by Makindu WSS* *By-Laws* *Nzumi Water Project:* *-operational since 7 months* *Serves sub-location with approx.: 3.600 people* *Financed by Amref, trained by MENR staff* *Same principle as Kai Water Project, running smooth with no problems for Makindu WSS !!* *7.0 km line of size 2 ½ ", 1 tank of 60cbm at the end of the line, 4 water kiosks.* *2" master meter to control consumption.* *Mulili Water Project:* *- operational just recently* *Serves sub-location with approx.: 3.700 people* *Financed by German Agro Action* *4" Master meter had just been installed last month, no reading yet in the Makindu WSS records* *7.0 km line of size 3",2 ½" and 1 ½", one Kiosk along the line, tank of 50 cbm at the end of the line currently under construction.* *Bulk supply from Makindu WSS to all communities at Kshs 15,00/cbm*
5.	**ElNino:**	*No information about ElNino involvement*
E.	**Consumers**	
1.	**Consumer Portfolio** **Total number?** **Ratio Major/minor consumers?** **Consumer classification** **Consumer categories?** **No. of new connect. Applied?** **No of new connect. Done?** **Percentage of suspected illegal connections?**	*Figure provided was 596* *Connections: approx.: 440 of which 266 are metered* *Not available* *Kenya Railways takes approx.: 1/3 of the production* *N/A* *As gazetted* *May: 1* *June: 3* *July: 1* *August: 2* *September: 2* *??*

	Coverage water?	*20.000 people approx.*
	How many Kiosks are in operation?	*14-15 Kiosks owned by individuals, out of which 4 were constructed by the MENR and given to individuals by ballot*
	Coverage Sanitation?	*No sanitation in place*
2.	**Consumer Indices**	*?*
3.	**Consumer Procedures**	
	Open account?	*Application form (GP.25WDD 3(REVISED) has to be copied by consumer, brings back filled with his details and information. Survey done by Divisional WO, after approval done, connection no. given* *Different people can do the connection in the field => no quality control, for meter however yes and they insist on new meter* *MR there when installation done*
	Close account?	*Consumer has to write a letter, and pay Kshs. 200 termination fee. Amount outstanding is calculated and forwarded to consumer for payment*
	Get a credit into the next bill?	*Issuing of credit is at the descretion of the Division Water Officer after the consumer has raised the dispute.*
	Change address?	*N/A, because bills are either delivered or collected*
	Transfer account?	*Consumer writes letter and pays change of tenant fee of Kshs. 200.00. Outstanding account has to be cleared and the new consumer retains the same account.*
	Give new Connection/Account No.	*Dead Account numbers are given to new applicants, otherwise follow chronological order*
F.	**Technical System**	
1.	**System Components?**	*System built by Kenya Railways around 1930 and handed over to MENR in 1992. Compensation agreement between KR and MENR not clear, but bills are sent to KR Nairobi HQ and no money received ever. Accumulated outstanding according to Makindu WSS todate: Kshs 6,453,660.00* *Source is Makindu Springs, pumped through a 4" raising main to an elevated storage tank of 64m^3 which serves only part of town otherwise pumping done direct to comsumers by-passing the tank. Only chlorination takes place at the source.*
	Is pumping necessary?	*Yes* *Power was connected in 1994, before they used 3 diesel pumps, 2 were from KR and 1 from MENR, but the KR are broken down and the MENR needs minor repairs then normally used as a stand-by.*

		Otherwise at the moment they have 2 electric pumps *Daily production: 406 cbm/day* *Monthly production: 12.200 cbm/day*
2.	**Zonal Meters** **How many are in the system?** **Are they controlling areas?** **Are they functioning?**	 *1 at pumping, but broke down when new pump was installed* *3 bulk supply meters* *3 yes* *1 non-operational* *3 operational*
3.	**Network** **Transmission lines?** **Distribution lines?** **Consumer lines?** **Whole system coverage?** **Fully utilised?**	 *4 km* *7 km* *??* *Approx. 23 km^2 in the division*
4.	**Coverage**	*??*
G.	**Technical Indices**	
1.	**Production** **Capacity per day** **Actual per day** **Production Efficiency?**	 *Not known for sure, as meter broken down, but based on pumping hours and rating* *Approx 406 cbm/day*
2.	**Pumping Efficiency**	*Current pumping 14 hrs/day with big pump (30 hpower)* *20 hrs/day with small pump (15 hpower) used alternatively*
3.	**Supply Efficiency** **Recorded consumption/actual production**	*?*
4.	**Service Efficiency** **How many days to attend to the problem?** **No. of total meters/number of operational meters?** **Total zonal meters/operational zonal meters?**	 *Depends on the back-up on material received from District office* *Not known* *4 out of which 3 are working*
5.	**Sanitation** **Treatment Capacity** **Actual**	 *N/A, as no sanitation system in place*
H.	**Technical Procedures**	

1.	**O&M**	*No procedures determined, they do what they can, provided materials are available.No instructions who does what.*
2.	**Rationing**	*No schedule determined*
3.	**Stock&Procurement** **Itemised stock list?** **Stock value** **Repair workshop** **Meter test bench** **Meter repairs/month/year** **Meter calibration** **Meter test request by consumers?** **List of tools and repair equipment available?**	 *Not available, as there is nothing in stock* *N/A* *Not available* *Not available* *??* *Not done* *No* *Not available*
4.	**Meter Test Procedures**	*Not available*
5.	**Requisition Procedures**	*Materials required are requested for by letter to the DWO Wote. Sometimes supplies are obtained from Nairobi and as vehicles of District Water Officer have as well broken down,public transport is used and refund of fare can take a very long time. As no imprest, personal money used*

STUDY OF INSTITUTIONAL IMPROVEMENT ON REHABILITATION OF WATER SUPPLY SYSTEMS FOR TEN (10) LOCAL TOWNS IN KENYA

No. OF CONNECTIONS	ARREARS (Kshs.)	JUNE 2000 BILL	CONSUMER NEVER CONNECTED	TRANSFERRED TO COMMUNITY SCHEME	METERED	FLAT RATE	WORKING	NON-WORKING	NO WATER	CUT OFF	ACTUAL 2000 CONSUMPTION (M^3)	AVERAGE CONSUMPTION (M^3)	LAST PAYMENT (Kshs.)
597	6,597,732.65	277,415.00	23	136	423	23	115	104	13	330	2,652	4,530	227,959.50

No. Of Actual Bills	107
No. Of Estimate Bills	117
Assumed In-Active	214
Transferred to community scheme	136
Consumer Never Connected	23
Total	597
Minimum Charge Bills	19.93%

Total Of Active & Inactive
438

Total m3 Billed
7,182

NOTE: While last payment column was supposed to reflect payments prior to 30th June 2000, payments are reflected upto 2nd October 2000

STUDY OF INSTITUTIONAL IMPROVEMENT ON REHABILITATION
OF WATER SUPPLY SYSTEMS FOR TEN (10) LOCAL TOWNS IN KENYA

A/C No.	ARREARS (Kshs.)	JUNE 2000 BILL	CONSUMER NEVER CONNECTED	TRANSFERRED TO COMMUNITY SCHEME	METERED	FLAT RATE	WORKING	NON-WORKING	NO WATER	CUT OFF	CUT OFF DATE	ACTUAL 2000 CONSUMPTION (M^3)	AVERAGE CONSUMPTION M^3	LAST PAYMENT (Kshs.)	DATE OF LAST PAYMENT
1	180.00			1						1	13/1/92				
2	720.00	720.00			1		1					48		555.00	4/9/00
3	144.00			1						1	24/1/00				
4	1,200.00									1	9/12/97				
5	780.00			1						1	24/4/99				
6	650.00									1	10/8/95				
7	888.00			1						1	17/10/95				
8	891.00			1						1	30/6/88				
9	1,460.00			1											
10	2,870.00			1											
11	715.00									1	10/12/93				
12	758.00									1	24/8/97				
13	700.00									1	24/6/97				
14	560.00	225.00			1		1					11		560.00	25/7/00
15	2,330.00			1						1	24/3/98				
16	1,200.00			1						1	24/1/00				
17				1								50			
18	7,385.00	1,350.00			1		1						10	600.00	25/9/00
19	200.00	200.00			1			1					10	300.00	7/9/00
20	1,450.00	200.00			1			1					10	200.00	12/9/00
21	680.00	200.00			1			1				10		1,890.00	21/8/00
22	1,095.00	200.00			1		1								
23	401.90									1	6/3/90				
24	313.00									1	30/4/88				
25	200.00			1						1	24/1/00			200.00	24/7/00
26										1	14/8/92				
27										1	10/4/95				
28										1	28/2/89				
29	92.50									1	24/8/93				
30	400.00	200.00			1			1					10	450.00	22/8/00
31	500.00	200.00			1			1					10	500.00	6/7/00
32	400.00	200.00			1			1					10	600.00	14/8/00
33	1,200.00	200.00			1		1					5			
34	600.00	200.00			1			1					10	600.00	10/7/00
35	325.00	200			1		1					8		1,000.00	12/9/00
36	1,140.00									1	2/11/98				
37	1,500.00									1	11/1/00				
38	360.00									1	24/2/99				
39	260.00			1						1	24/4/99				
40	2,895.00									1	24/9/98				
41	525.00	450.00			1			1					20	500.00	21/8/00
42	300.00			1						1	24/1/00				
43										1	15/2/93				
44	265.00									1	8/9/93				
980				1						1	11/11/98				
46	200.00	200.00			1		1					9		325.00	11/9/00
47	1,100.00	450.00			1			1					20	1,100.00	7/8/00
SUB-TOTAL	39,833.40	5,395.00	0	14	16	0	7	9	0	28		141	110	9,380.00	

STUDY OF INSTITUTIONAL IMPROVEMENT ON REHABILITATION
OF WATER SUPPLY SYSTEMS FOR TEN (10) LOCAL TOWNS IN KENYA

SUB-TOTAL	42,016.00	6,605.00	10	4	37	0	9	11	2	17		186	110	10,848.00	
A/C No.	ARREARS (Kshs.)	JUNE 2000 BILL	CONSUMER NEVER CONNECTED	TRANSFERRED TO COMMUNITY SCHEME	METERED	FLAT RATE	WORKING	NON-WORKING	NO WATER	CUT OFF	CUT OFF DATE	ACTUAL 2000 CONSUMPTION (M^3)	AVERAGE CONSUMPTION M^3	LAST PAYMENT (Kshs.)	DATE OF LAST PAYMENT
565	400.00			1	1					1	24/1/00				
566	1,690.00	690.00			1		1					28		1,890.00	13/9/00
567	1,675.00	600.00			1		1					25		700.00	5/9/00
568	1,200.00	200.00			1			1					10		
569	1,200.00	200.00			1			1					10		
570	3,747.00	900.00			1		1					35		1,000.00	18/8/00
571	2,170.00	200.00			1			1					10		
572	200.00	200.00			1		1					10			
573	200.00	200.00			1		1					7		200.00	16/8/00
574	400.00	200.00			1			1					10	400.00	5/7/00
575	400.00	200.00			1		1					9			
576	1,475.00	225.00			1		1					11		2,225.00	2/10/00
577	525.00	325.00			1		1					15			
578	600.00	300.00			1			1					10	600.00	8/8/00
579	400.00	200.00			1		1					2			
580	780.00	780.00			1		1					52		1,395.00	19/9/00
581	2,810.00	1,020.00			1		1					68		2,810.00	31/7/00
582	3,975.00	3,975.00			1		1					105			
583	200.00	200.00			1			1					10		
584					1										25/9/00
585	250.00	250.00			1		1					12			
586					1			1							21/6/00
587					1			1							24/6/00
588					1		1								14/6/00
589					1			1							25/8/00
590					1		1								24/6/00
591					1		1								24/7/00
592					1		1								19/8/00
593					1		1								15/8/00
594					1		1								25/9/00
595					1		1								25/9/00
596			1												
597			1												
SUB-TOTAL	24,297.00	10,865.00	2	1	31	0	20	9	0	1		379	60	11,220.00	

STUDY OF INSTITUTION IMPROVEMENT AND REHABILITATION OF WATER SUPPLY SYSTEMS FOR TEN (10) LOCAL TOWNS IN KENYA

Year 2000	January	February	March	April	May	June
Total Prod. M^3	7,488	8,396	11,840	12,852	13,384	14,244
Total Water Sold M^3	6,986	7,154	9,001	9,736	10,700	10,634
Average Assessment	1,669	1,850	3,464	2,899	3,136	4,335
Metered	2,147	2,134	2,367	3,667	4,394	3,129
Flat rate M^3	3,170	3,170	3,170	3,170	3,170	3,170
Unaccounted for W.	502 = 6.7%	1242=14.7%	2839=23%	3116=24.2%	2684=20%	3610=25%
Kiosk consumption m^3	-	735	366	485	585	415
No of connections operating	309	218	223	217	222	215
No. of Disconnections	13	1 + 92 hand to commun.	0	5	0	9
No. of Reconnections	2	0	3	0	5	2
No. of new connections	1	2	2	2	0	0
KWH Consumed	6,959	4,670	6,783	6,783	8,224	9,619
Revenue						
New connections						
Reconnections						
Metered						
Flat						
Kiosks						
Total Revenue	0.00	0.00		0.00	0.00	0.00
Expenditure						
Fuel						
Chemicals used (kg)		30kg	18kg	18kg	24kg	24kg
Repairs,spares						
Workshop,uniform						
Replacement of Equip						
Tel.Stationery,Transport						
Allowances						
Total Expenditure						
Revenue Collected						

STUDY OF INSTITUTION IMPROVEMENT AND REHABILITATION OF WATER SUPPLY SYSTEMS FOR TEN (10) LOCAL TOWNS IN KENYA

YEAR 2000

	JUNE	MAY	APRIL	MARCH	FEBRUARY	JANUARY
Accumulated Debt	7,317,723.10	7,110,076.10	6,907,760.10	6,798,521.10	6,571,215.10	6,403,434.10
Current month billed revenue	276,285.00	294,255.00	262,485.00	271,650.00	280,290.00	298,035.00
Total revenue collectable	7,594,008.10	7,404,331.10	7,170,245.10	7,070,171.10	6,851,505.10	6,701,469.10
Accumulated FY collection	1,127,498.00	1,060,586.00	973,978.00	913,809.00	751,398.00	698,414.00
Total outstanding revenue	7,527,096.10	7,317,723.10	7,110,076.10	6,907,760.10	6,798,521.10	6,571,215.10

YEAR 1999

	DECEMBER	NOVEMBER	OCTOBER	SEPTEMBER	AUGUST	JULY
Accumulated Debt	6,168,619.10	6,069,360.10	5,971,149.10	5,961,665.10	5,807,744.10	5,759,889.10
Current month billed revenue	258,875.00	175,666.00	186,138.00	205,753.00	204,220.00	181,053.00
Total revenue collectable	6,427,494.10	6,245,026.10	6,157,287.10	6,167,418.10	6,011,964.10	5,940,942.10
Accumulated FY collection	568,160.00	544,100.00	467,693.00	379,766.00	183,497.00	133,198.00
Total outstanding revenue	6,403,434.10	6,168,619.10	6,069,360.10	5,971,149.10	5,961,665.10	5,807,744.10

Payments data obtained from the Cashier through form F.O.17
(F.O.17 is a form prepared by the Cashier when surrendering monies collected)

Year 2000

	January	February	March	April	May	June
Water Sales	131,967.00	61,203.00		168,837.00	56,570.00	
Deposit	3,000.00	1,200.00	NO F.O.17	12,000.00	3,600.00	
Labour	200.00	2,000.00	AVAILABLE	800.00	200.00	
Reconnection fee						
Water Board fee (permits)				3,100.00		
Total	**135,167.00**	**64,403.00**	**0.00**	**184,737.00**	**60,370.00**	**0.00**

STUDY OF INSTITUTION IMPROVEMENT AND REHABILITATION OF WATER SUPPLY SYSTEMS
FOR TEN (10) LOCAL TOWNS IN KENYA

YEAR 2000

	JUNE	MAY	APRIL	MARCH	FEBRUARY	JANUARY
Accumulated Debt	7,317,723.10	7,110,076.10	6,907,760.10	6,798,521.10	6,571,215.10	6,403,434.10
Current month billed revenue	276,285.00	294,255.00	262,485.00	271,650.00	280,290.00	298,035.00
Total revenue collectable	7,594,008.10	7,404,331.10	7,170,245.10	7,070,171.10	6,851,505.10	6,701,469.10
Actual collection	66,912.00	86,608.00	60,169.00	162,411.00	52,984.00	130,254.00
Accumulated FY collection	1,127,498.00	1,060,586.00	973,978.00	913,809.00	751,398.00	698,414.00
Total outstanding revenue	7,527,096.10	7,317,723.10	7,110,076.10	6,907,760.10	6,798,521.10	6,571,215.10

YEAR 1999

	DECEMBER	NOVEMBER	OCTOBER	SEPTEMBER	AUGUST	JULY
Accumulated Debt	6,168,619.10	6,069,360.10	5,971,149.10	5,961,665.10	5,807,744.10	5,759,889.10
Current month billed revenue	258,875.00	175,666.00	186,138.00	205,753.00	204,220.00	181,053.00
Total revenue collectable	6,427,494.10	6,245,026.10	6,157,287.10	6,167,418.10	6,011,964.10	5,940,942.10
Actual collection	24,060.00	76,407.00	87,927.00	196,269.00	50,299.00	133,198.00
Accumulated FY collection	568,160.00	544,100.00	467,693.00	379,766.00	183,497.00	133,198.00
Total outstanding revenue	6,403,434.10	6,168,619.10	6,069,360.10	5,971,149.10	5,961,665.10	5,807,744.10

Payments data obtained from the Cashier through form F.O.17
(F.O.17 is a form prepared by the Cashier when surrendering monies collected)
Year 2000

	January	February	March	April	May	June
Water Sales	131,967.00	61,203.00		168,857.00	58,470.00	
Deposit	3,000.00	1,200.00	NO F.O.17	12,000.00	1,600.00	
Labour	200.00	2,000.00	AVAILABLE	880.00	300.00	
Reconnection fee						
Water Board fee (meters)				3,100.00		
Total	135,167.00	64,403.00	0.00	184,737.00	60,370.00	0.00

STUDY OF INSTITUTIONAL IMPROVEMENT ON REHABILITATION OF WATER SUPPLY SYSTEMS FOR TEN (10) LOCAL TOWNS IN KENYA

1. Major Consumer

CONSUMER NAME	ACCOUNT NUMBER	OUTSTANDING AS AT JUNE 2000
Makindu A. Primary School	186	1,910.00
Makindu Sec School	165	1,000.00
Ngukuni Pri. School	168	450.00
Makindu Hospital	309	90,404.00
Kenya Railways:		
Station	375	174,935.00
House	376	195,625.00
House	377	131,420.00
Training School	378	153,790.00
Police Railways	379	183,550.00
House	380	153,630.00
"	382	269,610.00
"	383	93,935.00
"	385	503,445.00
"	386	84,540.00
"	387	427,830.00
"	388	153,990.00
Kenya Railways:		
Block	390	1,026,673.00
"	392	568,190.00
Club Staff	393	454,645.00
Staff + Police Block	395	1,016,147.00
"	396	331,905.00
	Total:	**6,017,624.00**

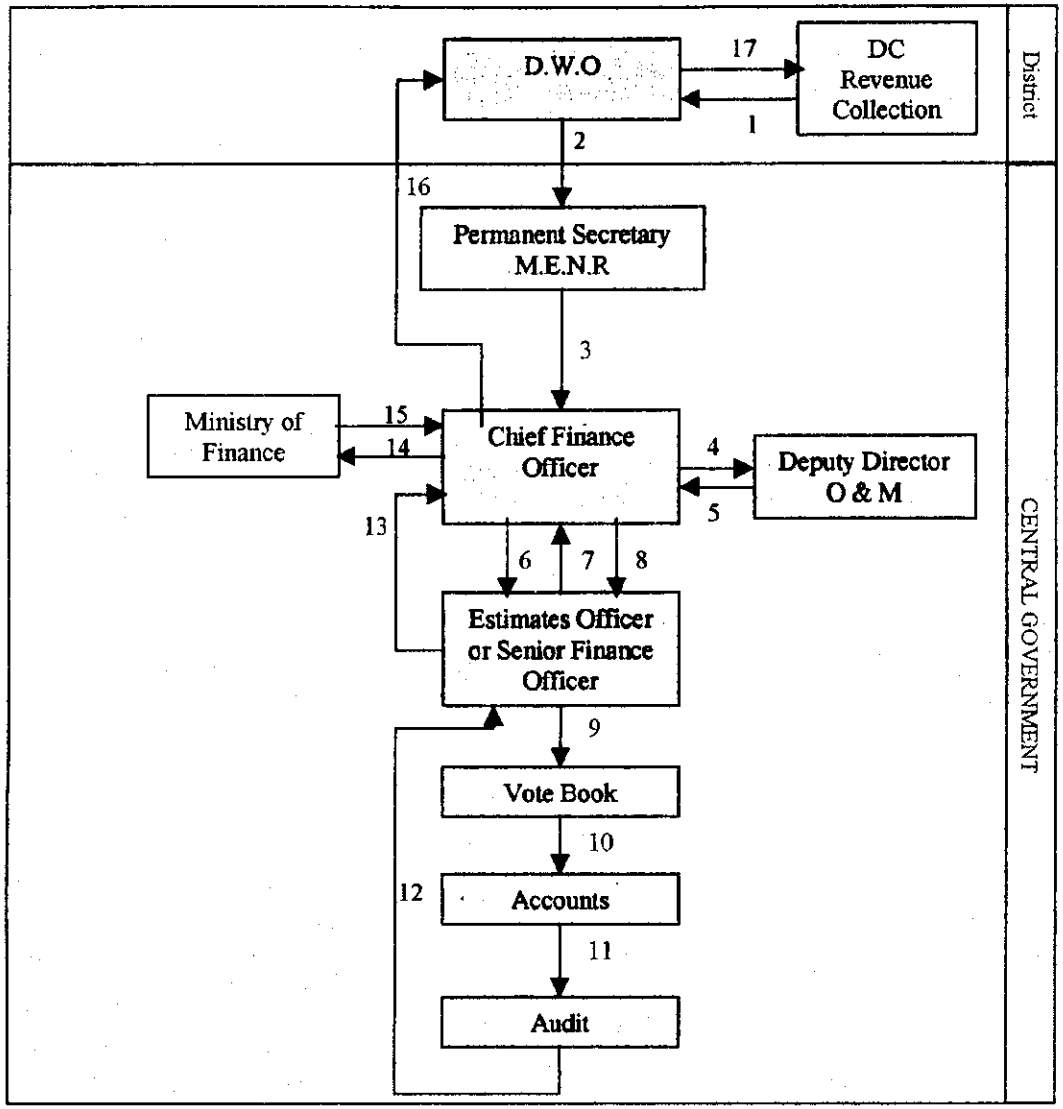
Total outstatnding minor consumers	580,108.65
Total outstatnding major consumers	6,017,624.00
total outstanding as at June 2000	6,597,732.65
Number of billable connections	496
Number of minor consumer connections	471
Number of major consumer connections	25
Average outstanding / minor consumer	1,231.65
Average outstanding / major consumer	240,704.96

APPENDIX K3
GENERAL

A.I.E PROCESSING CHART

FIGURE: 8.2

STUDY OF INSTITUTIONAL IMPROVEMENT ON REHABLITITATION OF WATER SUPPLY SYSTEMS FOR TEN (10) LOCAL TOWNS IN KENYA



AIE PROCESSING.PPT

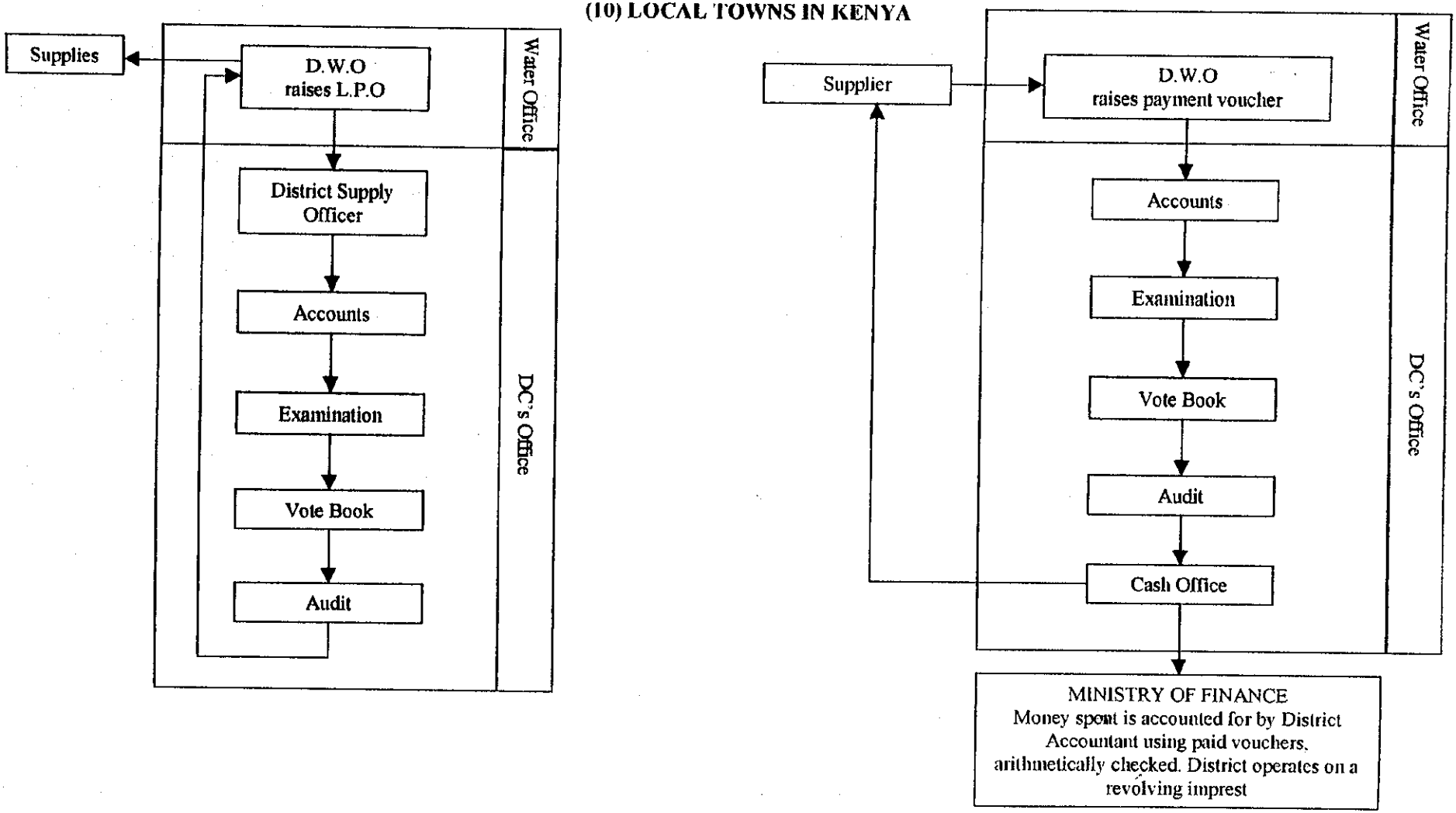
A.I.E = Authority to Incur Expenditure

1) DC forwards Form F.O. 17 to the DWO containing the total monthly collection made on behalf of the water department.
2) DWO requests for A.I.E based on form F. O. 17 collection and A.I.E percentage and forwards to P. S. The A.I.E percentage depends on the district and is determined by MENR. The percentage for the towns covered varies from 63% to 90%.
3) Permanent Secretary forwards request to Chief Finance Officer
4) Chief Finance Officer forwards to Deputy Director O & M for recommendation.
5) Deputy Director O & M recommends and returns request to Chief Finance Officer.
6) Chief Finance Officer forwards request to Estimates Officer or Senior Finance Officer department.
   - Checks the records and confirms the amounts
   - Compares with district allocation budget and
   - Drafts A.I.E for Chief Finance Officer to sign.
7) Estimate Officer forwards documents to Chief Finance Officer.
8) Chief Finance Officer signs and returns documents to Estimates Officer.
9) Estimate Officer forwards documents to Vote Book for entry against the budget provision.
10) Vote Book Officers forwards documents to Accounts for checking
11) Accounts forwards documents to Audit for checking.
12) Audit forwards documents to Estimate Officer.
13) Estimates Officer seals the A.I.E and drafts for signature of Chief Finance Officer
14) Chief Finance Officer forwards request to Ministry of Finance Att: Paymaster General
15) Ministry of Finance / Treasury returns A.I.E to the Chief Finance Officer
16) Chief Finance Officer forwards the A.I.E to the DWO
17) DWO forwards A.I.E to the District Accountant from where cheque now can be issued provided the district has:
   - Liquidity and
   - Procurement formalities have been complied with.

L.P.O & PAYMENT PROCESSING CHART

FIGURE: 8.3

STUDY OF INSTITUTIONAL IMPROVEMENT ON REHABILITATION OF WATER SUPPLY SYSTEMS FOR TEN (10) LOCAL TOWNS IN KENYA



Development Impact Consulting

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P. O. Box 16694, NAIROBI Tel: 713741, 712649 Fax: 712720 E-mail: dic@insightkenya.com

CONSORTIUM

Study of Institutional Improvement and Rehabilitation of Water Supply Systems for Local Towns in the Republic of Kenya

Location: MALINDI Sub-Area Office NWCPC
10.11.2000
Management Contract H.P.Gauff in association with Gauff Utility

Interviewer: LEK and CK

Discussion held with: Manager Mr. Donald Pumfrey
Mr. Eng. Moses Kinya
Project Manager Nairobi Office: Mr. David Baker

Tel.: 0123-31037, 30923

Meeting with the manager in Malindi had to be termed in-official, as H.P.Gauff was not informed by the project management. No indices or financial details could be obtained, therefore only general discussion. Clearance was to be obtained from NWCPC head office in Nairobi, but nothing has been received so far.

MALINDI MANAGEMENT CONTRACT	
QUESTIONS:	*Answers:*
GENERAL:	
Contract in place?	*Yes*
Line of Command?	*NWCPC Manager (Chief Sub-Area Manager) in Malindi -> Regional Manager Mombasa -> MD NWCPC ->HQ Liaison officer-> Head O&M HeadOffice Nairobi -> MD of NWCPC -> Board of Directors (for certain issues only)*
Any comments on current situation?	*Management consultant still trying to catch up with the gap left between the first and the second contract. Offices are set up, even though not yet final, as O&M separate from administration and store.* *Trying to re-instate procedures that were in place before*
Problems experienced?	*Only in relation to the procurement because of delay and additional requirements, as well as writing off of debts that cannot be collected.* *Water Act not really supporting the effort and should be dealt with soonest.*
Any recommendation on changes to improve the situation?	*Procurement issues should be simplyfied* *Write-off procedure on consumer outstandings that cannot be collected, should be simplified within GOK / NWCPC framework* *Tariff: The Consultant's suggested social Tariff structure(leave rural kiosk tariffs low) should have been considered when Tariff policywais made, because these payments are very difficult to collect and often result in illegal action as a consequence; and approval period should be much shorter as it is currently*
Cause of the problem if any?	*Government and Parastatal guidelines and procedures and the Water Act (Criminal case first, Civil case second...)*
Any problems on Fee payments?	*No, standing order to cover fee and O&M is paid from the collection account, balance at end month goes to NWCPC*
FINANCES:	
Is the management financially independent?	*In principle yes, but with limitations on procurements.*
Can collected revenue sustain the operation?	*Cannot be commented on at the moment at source cost are not known to the Manager. But it is clear that electricity tariff adjusted three times while water is not over the same period in*

	time. Neither is the the authority of the Client to comment on actual figures. Can only comment on the trend which is as expected going up. Project since 8 months in operation and initial setting up accounts for considerable time.
How is revenue collected?	*At the office, as KCB was not willing to continue with the collection. Revenue is collected on behalf of the Client and banked in Malindi twice daily, then transferred to Mombasa.*
OPERATION:	
Any interferance in the day to day operation?	*No, but biggest impediment is the procurement which has to follow the standard Government procedures*
Procedures manifested already ?	*No, but best practice in the circumstances is applied for O&M and Financial issues. Later on these will be pu into user manuals*
STAFF:	
Relationship with the NWCPC/Management staff?	*Staff mixed between NWCPC and management. Staff then seconded to the management consultant.* *Total: approx. 70 with ratio: 50 Consultant / 20 NWCPC*
Are any incentives offered to improve the output?	*Yes*
RECOMMENDATIONS: **For other management contracts?**	*1. Operator/Manager to have sufficient autonomy.* *2. There should be a mode of speedy decision making, i.e. shorten the institutional framework to go through for the purpose of increased efficiency.*

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CONSORTIUM

Study of Institutional Improvement and Rehabilitation of Water Supply Systems for Local Towns in the Republic of Kenya.

Location: NYERI Water Company
NYEWASCO
P.O.Box

Tel.: 0171-4548/4617/4623 Dir. Line 2684
Fax: 0171-2734

Date: 20.12.00

Interviewer: LEK

Telephone Interview held with: MD : Eng. Nguiguti

NYERI WATER COMPANY	NYEWASCO
Any comments on current situation?	*Staff still not happy with their remuneration and also other terms and conditions of service.*
Any recommendation on changes to improve the situation?	*The company is registering as a member of F.K.E and hopes to seek for advice to resolve outstanding issues.*
Cause of the problem if any?	*Misunderstandings between union officials*
Agency agreement between company and Council finalised?	*This was signed on 19th March 1999 and ammended on 7th April 2000.*
Ownership of the company clear?	*Yes, owner is Nyeri Municipal Council.*
Any advice for other water companies to integrate into their agency agreement?	*User changes for use of assets needs to be established before commencement of operation*
Does the company have an Opening Balance Sheet?	*?*
How were assets handeled?	*All assets remain in the ownership of Nyeri Municipal Council.*
How were Consumer outstanding balances handeled?	*These were taken over by the company. ? at what level, as they were or audited?*
How were liabilities handeled? (Power, Creditors)	*These were taken over by the company.*
Is the company financially independent?	*Yes.*
Can collected revenue sustain the operation?	*Collected revenue not enough to cater for O & M, debt servicing (council's), depreciation of used asstes*

	and new works
Any other problems encountered?	*Intereferance of running of the company by the council, however this is now decreasing.??????*
Relationship between CMT and Board?	*Government ??????*
Relationship CMT/Board/ Council?	*There has been a problem as the council has tried to interfere with the work of the board however, the council has not succeeded.*
Any interferance in the day to day operation?	*No.*
Is day to day operation autonomous as far as CMT is concerned?	*Yes.*
How is the relationship with the consumers? Has the situation improved?	*Customers are much happier with the service rendering by the company.*
Relationship with the staff? All former staff absorbed?	*All former staff were absorbed however, their salary expectations have not been met*
Conditions under which staff were absorbed?	*All had to be absorbed. Their retention then by the company depends on their performance.*
Retired on the Council side?	*No.*
Have staff salaries changed since take over? How?	*The minimum salsry increase given with effect of 1st Sept. 1999 was 15%. Since then the staff have had 7.5% increase with effect from 1st Jan. 2000.*

	Are any incentives offered to improve the output?	*Incentives are being worked out.*

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CONSORTIUM

Study of Institutional Improvement and Rehabilitation of Water Supply Systems for Local Towns in the Republic of Kenya

Location: KITALE Water Company
P.O.Box 2248 **Tel.: 0325-30074**

Date: 24.11.00

Interviewer: LEK and CK

Discussion held with: Act MD (actually TM): Patrick Wambulwa
CM Kibet Torut
Fin. Advisor to Kitale , Eldoret: Mr. Langer

KITALE WATER COMPANY KIWACO	
Any comments on current situation?	*Very difficult*
Any recommendation on changes to improve the situation?	*There are other models, whereby 3 yrs are given to gradually rehabilitate and build capacity. Amounts/Funding necessary is determined by a consultant, partly loan partly grant through the Central Government, (a model from Philipines) Lacking start up help. A a centralised advise through the regulatory body, which helps you first and then controlls and regulates as soon as you stand*
Cause of the problem if any?	*No access to loan facilities and burden of honouring liabilities taken over from the former operator (Council)*
Agency agreement between company and Council finalised?	*No*
Ownership of the company clear?	*Yes*
Any advice for other water companies to integrate into their agency agreement?	*Agency agreement should be finalised prior to commencement of the new company, reconciliation of personell issues of absorbed staff, consumer accounts, power liabilities and investment loans as they cause a lot of problems when confronted with it afterwards*
Does the company have an Opening Balance Sheet?	*Working on it*
How were assets handeled?	*Proposed all retained by the Council. Proposal from UWASAM for lease amount for the assets, not discussed with Council yet*
How were Consumer outstanding balances handeled?	*Taken over as they were*
How were liabilities handeled? (Power, Creditors)	*Worked on at the moment. Forced into power payments, current and past. Problem is that no credits are reflected on the KP&L account, as the Council made payments which were then applied by KP&L to various accounts but not clear. Everything needs reconciliation. Working on it since February*
Is the company financially independent?	*Yes, in so far as own bank a/c, and Council is not involved at all.*
Can collected revenue sustain the operation?	*No, because majority of meters not working and billing way beyond production. Procured out of revenue 450 new meters from collection, placed in certain zones to improve billing and revenue collection.,* *Applied to CIM grant f or new meters, additional funds*

	hoped for from KfW loan – but earliest 2 nd half of next year. *Fitting of meters for non- metered accounts into priority one.*
Any other problems encountered?	*Loan had been given to the Council (through LGLA)????* *From mid 1970s KfW, before could be from different sources* *Accountant from KIWACO at Council, to speed up the analysis* *Portfolio: mainly domestic, apart from prison and police* *All GOK bodies have a payment problem, delays* *Supply:* *Water shortage, cut off power (1 mio current 600 arrears), then used diesel, diesel from collection 10 hours pumping For 3800 cbm/day* *Agricultural consumers, i.e. seasonal payments like the month of March, which requires money for planting, no payment of water.* *KCC closed one of the major consumers* *If 80 % is collected* *Network rehabilitated in 1992*
Relationship between CMT and Board?	*MD on the Board, on interferance* *Goodwill to be improved further, involve chairman into building good will*
Relationship CMT/Board/ Council?	*Consolitative meeting, Board and Councillors, frequent* *Like AGM to explain such that everybody understands* *What has been discussed and dicided, then has to go the Board / Council, because Agency agreement not yet done, and KfW conditions involve the Council.*
Any interferance in the day to day operation?	*No*
Is day to day operation autonomous as far as CMT is concerned?	*Yes*
How is the relationship with the consumers? Has the situation improved?	*Company started in Nov, but officially in January. Consumer did not really get better service since, but consumeris attended to friendly, illegal connections are reported by consumers, because they suffer themselves under the current rationing,* *Technically: in the network immediate attendance to a problem, but at production it is a problem.* *There are 5 pumping stations and power is the main problem*
Relationship with the staff? **All former staff absorbed?**	*Initially yes, but later 2 staff were taken back to the council, 3 additional employed. Total Staff : 93* *(Billing and Connection details as at 30.06.00 refer)*
Conditions under which staff were	*Letter of release from the Council however never formalised*

absorbed?	*with PSC and signing of the agency agreement and letter of employment from the company. But agreed to take back to council he who cannot perform.*
Retired on the Council side?	*Provident Fund ? suggested to continue to pay into it, but needs to be checked whether possible or not. Again an issue that*
Have staff salaries changed since take over? How?	*No for those from council, company paid full new salaries that had not been implemented by the council. KIWACO agreed to pay even arrears back to 1.1.99*
Are any incentives offered to impreove the output?	*MR and plumbers got bicycles and the labourers (bicycles are theirs to use, but given as loan, whereby 50 Kshs /day paid when used for KIWACO and this is off-set against loan)*

ACTUAL CONSUMER BILLS CALCULATION ANALYSIS SUMMARY TABLE: ST 1.1

STUDY OF INSTITUTIONAL IMPROVEMENT ON REHABILITATION OF WATER SUPPLY SYSTEMS FOR TEN (10) LOCAL TOWNS IN KENYA

Only calculated for actual meter reading information and billing obtained from the respective consumer ledger.

LAMU

	No Of Bills	Correct Bill	No. Of Wrongly Calculated Bills	No. Of Connections without bill and Consp. > 0	Amount Charged	No. Of Different Charges (Kshs.)	No. Of Different Consp. (m^3.)
Between $0m^3$ and $10m^3$	56	250.00	0	0	2 amounts of 280/= and 480/=	2	10
Between $11m^3$ and $20m^3$	27		2	0	Range from 280/= to 580/= with intervals of 25/= and 50/=	12	10
Between $21m^3$ and $40m^3$	8		0	0	Range from 590/= to 1,040/= with intervals of 30/=, 60/=, 90/= and 120/=	8	8
Between $41m^3$ and $60m^3$	2		0	0	2 amounts of 1,190/= and 1,860/=	2	2
Between $61m^3$ and $100m^3$	1		0	0	1 amount of 26,95/=	1	1
Over $100m^3$	1		0	0	1 amount of 4,285/=	1	1
Totals:	95		2				

NAROK

	No Of Bills	Correct Bill	No. Of Wrongly Calculated Bills	No. Of Connections without bill and Consp. > 0	Amount Charged	No. Of Different Charges (Kshs.)	No. Of Different Consp. (m^3.)
Between $0m^3$ and $10m^3$	211		12	16	Range from 200/= to 2,570/=	14	10
Between $11m^3$ and $20m^3$	76		6	5	Range from 250/= to 1,130/=	16	10
Between $21m^3$ and $40m^3$	69		15	2	Range from 250/= to 2,570/=	33	18
Between $41m^3$ and $60m^3$	20		5	0	Range from 570/= to 7,625/=	18	13
Between $61m^3$ and $100m^3$	7		1	1	Range from 200/= to 11,100/=	7	6
Over $100m^3$	16		1	2	Range from 1,235/= to 30,150/=	16	15
Totals:	425		40				

MERU

	No Of Bills	Correct Bill	No. Of Wrongly Calculated Bills	No. Of Connections without bill and Consp. > 0	Amount Charged	No. Of Different Charges (Kshs.)	No. Of Different Consp. (m^3.)
Between $0m^3$ and $10m^3$	25		2	12	Range from 125/= to 300/=	4	10
Between $11m^3$ and $20m^3$	426		17	44	Range from 161/= to 1,300/=	26	9
Between $21m^3$ and $40m^3$	105		20	18	Range from 200/= to 1,800/=	38	18
Between $41m^3$ and $60m^3$	31		4	6	Range from 853/= to 2,435/=	15	11
Between $61m^3$ and $100m^3$	13		5	0	Range from 1,490/= to 7,070/=	11	6
Over $100m^3$	8		0	4	Range from 5,100/= to 18,025/=	8	8
Totals:	692		48				

KABARNET

	No Of Bills	Correct Bill	No. Of Wrongly Calculated Bills	No. Of Connections without bill and Consp. > 0	Amount Charged	No. Of Different Charges (Kshs.)	No. Of Different Consp. (m^3.)
Between $0m^3$ and $10m^3$	138		0	0	2 amounts of 200/= and 250/=	2	10
Between $11m^3$ and $20m^3$	35		1	1	Range from 275/= to 475/=	9	8
Between $21m^3$ and $40m^3$	15		0	0	Range from 560/= to 1,070/=	10	10
Between $41m^3$ and $60m^3$	6		1	0	Range from 1,190/= to 1,850/=	6	5
Between $61m^3$ and $100m^3$	2		0	0	2 amounts of 2,165/= and 2,635/=	2	2
Over $100m^3$	10		0	0	Range from 4,600/= to 76,650/=	10	10
Totals:	207		2				

VERIFIED STATISTICS SUMMARY

SUMMARY TABLE: ST6.2

STUDY OF INSTITUTIONAL IMPROVEMENT ON REHABILITATION OF WATER SUPPLY SYSTEMS FOR TEN (10) LOCAL TOWNS IN KENYA

DETAILS	Units	NAROK		MERU		MURANGA		KABARNET		MAKINDU		WUNDANYI		MIGORI		LAMU		WEBUYE		MUMIAS	
Total Population	No.	43,000		130,100		60,000		17,500		6,400		7,200		99,700		12,000		73,000		110,400	
Total Staff	No.	34		48		56		29		10		35		29		17		28		13	
Total Active + In-active Accounts	No.	1,333		3,225		2,933		768		438		1,136		669		837		1,852		1,439	
Ratio (accounts per staff)	No.	39.21		67.19		52.38		26.48		43.80		32.46		23.07		49.24		66.14		110.69	
No of A/C transferred to community	No.	-		-		-		-		136		-		133		-		Not available		-	
Metered Accounts	No.	999		2,644		2,930		470		423		1,114		213		800		1,646		1,603	
Working	No.	371		272		1,449		206		115		493		79		104		7		8	
Non-working	No.	495		2,225		1,441		161		104		290		136		697		1,609		1,264	
Unmetered Accounts	No.	289		463		2		-		23		-		456		35		433		104	
Actual Billed Accounts	No.	399	48.19%	110	4.77%	1,433	49.65%	206	36.20%	107	47.77%	427	68.81%	26	12.15%	95	13.46%	4	0.55%	4	0.61%
Estimate Billed Accounts	No.	539	65.10%	2,196	95.23%	1,453	50.35%	363	63.80%	117	52.23%	192	31.19%	188	87.85%	608	86.54%	729	99.45%	650	99.39%
Dis-connected Accounts	No.	221		263		36		199		198		357		220		95		767		528	
Major / Minor Consumers	No.	20/918		25/2281		28/2858		12/557		14/210		8/611		3/211		2/701		3/730		9 / 1597	
Minimum charged bills	%	67.27%		15.43%		63.77%		34.64%		19.93%		67.04%		53.01%		78.14%		12.37%		18.41%	
Production capacity per month	m^3	72,000		150,000		100,800		420,000		14,400		46,080		14,400		90,000		54,000		42,900	
Actual Production June 2000	m^3	38,431		132,000		82,500		51,000		12,180		21,600		5,400		22,833		27,120		21,180	
Production efficiency	%	50.60%		88.00%		81.85%		Capacity not used		84.58%		46.88%		37.50%		25.37%		50.22%		49.37%	
Total consumption June 00	m^3	23,416		45,056		41,029		11,500		7,182		10,020		5,592		7,604		27,013		31,558	
Actual	m^3	10,843		2270		21,114		5,402		2,652		5,710		392		1,294		245		245	
Estimate	m^3	12,573		42786		19,914		6,098		4,530		4,310		5,200		6,510		26,768		31,311	
UFW June 2000	m^3	13,015		86,944		41,472		39,500		4,998		11,580		consumed > produced		15,029		107		consumed > produced	
UFW	%	35.73%		65.87%		50.27%		77.46%		41.00%		53.61%				65.82%		0.39%			
Value of water lost	Kshs.	313,892.94		2,208,726.10		1,288,842.37		1,313,583.91		193,022.75		431,117.74				563,136.83		3,214.49			
Billed Revenue June 2000	Kshs.	564,742.00		1,144,603.00		1,275,044.00		382,430.00		277,415.00		423,967.00		92,656.00		292,380.00		811,523.00		721,750.00	
Billed Revenue HQ Reporting June 2000	Kshs.	295,000.00		1,203,181.00		1,211,226.00		382,430.00		276,285.00		385,672.00		40,000.00		338,122.00		150,000.00		150,000.00	
Billing Efficiency June 2000	%	64.27%		34.13%		49.73%		22.66%		58.96%		49.58%		>100%		34.18%		99.61%		>100%	
Collected revenue June 2000	Kshs.	427,020.00		428,315.00		1,108,326.00		328,123.00		66,912.00		228,720.00		32,258.00		100,935.00		178,228.00		132,896.00	
Collection efficiency June 2000	Kshs.	75.61%		37.42%		86.92%		85.80%		24.12%		53.95%		34.81%		34.52%		21.96%		18.39%	
Average Tariff June 2000 / m^3	Kshs.	24.12		25.40		31.08		33.26		38.63		42.31		16.57		37.47		30.04		22.87	
Total Debtors end May 2000	Kshs.	8,664,102.50		20,412,091.50		12,841,260.80		1,639,826.00		6,597,732.65		3,289,084.15		940,349.00		3,137,731.00		2,357,599.95		2,020,145.95	
HQ Reporting end May 2000	Kshs.	4,235,072.00		40,094,320.50		13,808,023.90		1,539,959.00		7,317,723.10		3,718,960.00		609,916.30		2,436,479.00		355,421.00		1,552,762.00	
Major consumers:																					
G.O.K	%					61.42%		Not available		N/A		46.08%		Not available		Not available		0.64%		Not available	
(Others Consumption >100m3 or arrears >20,000.00)	%	3.26%		52.94%		10.98%		50.35%		91.60%		2.04%		16.98%		43.20%		1.40%		5.37%	
Minor Consumers	%	96.74%		47.06%		27.60%		49.65%		8.40%		51.88%		84.02%		56.80%		97.96%		94.63%	
AIE percentage	%	64%		80%		65%		N/A				65%		65%		90%		63%		Not available	
FY Collection	Kshs.	3,827,478.00		6,771,976.00		9,247,457.50		2,319,895.20				2,173,738.00		730,954.00		1,295,717.00		2,163,140.00			
AIE earned FY 99/00	Kshs.	2,449,585.92		4,063,186.60		6,010,847.38		N/A				1,412,929.70		475,120.10		1,166,146.30		1,362,776.20			
AIE received FY 99/00	Kshs.	1,286,980.00		3,956,986.00		6,022,560.00		N/A				2,635,300.00		623,460.00		1,269,860.00		Not available		Not available	
AIE Expenditure:		Kshs:	%	Kshs:	%	Kshs:	%	Kshs:	%	Kshs:	%	Kshs:	%	Kshs:	%	Kshs:	%	Kshs:	%	Kshs:	%
Transport & staff related expenses	Kshs.	497,238.00	38.67%	765,085.70	19.86%	1,910,296.65	36.81%	217,863.35	26.54%			344,413.25	15.81%	399,494.00	50.94%	377,321.80	29.83%				
O&M	Kshs.	534,042.00	41.53%	2,420,062.60	62.81%	2,490,248.25	50.33%	200,470.00	24.42%			1,119,580.65	51.40%	320,280.60	40.84%	854,179.50	67.53%				
Postage	Kshs.	9,922.00	0.77%	31,953.20	0.83%	22,736.00	0.46%	3,537.40	0.43%			94,960.00	4.36%	15,400.00	1.96%	18,400.00	1.45%	Not available			
Telephone	Kshs.	-		152,208.90	3.95%	55,000.00	1.11%	235,643.25	28.71%			89,200.00	4.10%	-		-					
Purchase of Meters	Kshs.	-		63,927.80	1.66%	99,000.00	2.00%	-				34,999.00	1.61%	-		-					
Stationary	Kshs.	45,000.00	3.50%	104,138.50	2.70%	65,854.00	1.33%	6,290.00	0.77%			85,000.00	3.90%	49,121.00	6.26%	14,945.00	1.18%				
Fuel & Gas	Kshs.	199,715.70	15.53%	315,690.50	8.19%	304,286.50	6.15%	157,032.00	19.13%			409,947.20	18.82%			-					
AIE Expense:	Kshs.	1,285,917.70	2	3,853,067.10	1	4,947,421.40	2	820,836.00	3		4	2,176,100.10	2	784,295.60	2	1,264,846.10	2		4		4

x Verified Figures (Extracted from the consumer information raw data)

x Provided figures (Extracted from O&M, Billing and revenue data and AIE data as provided and production figures from Gibb)

x Calculated figures (Arrived at using provided figures)

x Splitting between GOK and other consumers not possible due to the recurrent connection nos. in different zones or not adequate information thereto. Further verification of data required from field

1 AIE expenditure relating to water supply only
2 AIE expenditure relating to District
3 Details relating to 6 months only
4 Details not readily available

} Information obtained from vote book and grouped