

B.	Utility Indices	
1.	<p>Billing Consumption Actual vs Estimate</p> <p>Consumption Billed per month</p> <p>Consumption Billed for the last 3 years?</p> <p>Billing Efficiency: Water billed/ Water supplied</p> <p>Billing Effectiveness: How many out of 100 bills are wrong or returned for reason?</p>	<p><i>Not readily available</i></p> <p><i>Zone 16 books</i> <i>Zone 25 books</i> <i>Zone 3 4 books</i> <i>Zone 44 books</i> <i>Zone 5 5 books</i> <i>Zone 6 3 books</i> <i>Zone 7..... .4 books</i> <i>Zone 8 5 books</i> <i>Zone 95 books</i> <i>Zone 10 2 books</i></p> <p><i>Can only be extracted from consumer ledger</i> <i>Not readily available</i></p> <p><i>Not available, no production information available and O&M Monitoring report not found</i></p> <p><i>High, but consumers only come with complaints about the bill, if there was no water and they were still billed on average consumption</i></p>
2.	<p>Revenue & Collection Revenue Billed vs Revenue Collected per month</p> <p>For the last 3 years monthly and annual figures?</p> <p>Collection efficiency: Total billed/ Total collected</p>	<p><i>Billed and collected revenue is reflected in Table 8.3.2., (billed revenue: average is used as the monthly figure). To obtain the actual figure it is necessary to go through ALL consumer ledgers and abstract the monthly figure consumer by consumer.</i></p> <p><i>Not readily available</i></p> <p><i>Total billed is not the actual, but a monthly estimated figure. Therefore ratio not calculated</i></p>
3.	<p>UfW 1 - Recorded consumption/Production (supply efficiency) per month Or production vs billed consumption For the last 3 years, monthly and annually? Value of UfW: loss x average tariff rate of system per month</p>	<p><i>Not available and cannot be calculated</i></p> <p>??</p> <p>??</p> <p>??</p>
4.	<p>Tariff What is the average tariff rate per cbm? (Total billed water/Total water supplied = Average) Tariff structure? Current</p>	<p>??</p> <p><i>Refer to gazetted tariff urban</i></p>

	Last 3 years: Additional charges? Additional sources of income?	<i>Dto</i> <i>No</i> <i>None</i>						
5.	Funding Required Funding per month? Salary Procurements Power Chemicals Others	<i>Not established</i> <i>Refer to HQ</i> <i>Total FY:99/00 Kshs 4,809,720.40 refer to Table 8.5.2.</i> <i>Powers automatically paid through HO, not known how much</i> <i>Chemicals are ordered in quantities, HQ</i> <i>N/A</i>						
6.	Cost Total per month Salary Power O&M Administration Others	<i>Not yet established</i>						
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	<i>As at end of FY Kshs 40,869,186.50, according to information abstracted in Table 8.3.2. BUT GOK summary list prepared every 3 months shows</i> <table style="width:100%; border:none;"> <tr> <td style="text-align:left;"><i>3/2000</i></td> <td style="text-align:center;"><i>12/1999</i></td> <td style="text-align:right;"><i>9/1999</i></td> </tr> <tr> <td style="text-align:left;"><i>56,886 Mil</i></td> <td style="text-align:center;"><i>54,625 Mil</i></td> <td style="text-align:right;"><i>52,763 Mil</i></td> </tr> </table> <i>=> which translates into approx 2 Mil per quarter or 667,000.00 month</i> <i>??</i> <i>Not sure which of the above correct/ only average available</i> <i>/Average FY =564,331.30</i>	<i>3/2000</i>	<i>12/1999</i>	<i>9/1999</i>	<i>56,886 Mil</i>	<i>54,625 Mil</i>	<i>52,763 Mil</i>
<i>3/2000</i>	<i>12/1999</i>	<i>9/1999</i>						
<i>56,886 Mil</i>	<i>54,625 Mil</i>	<i>52,763 Mil</i>						
C.	Utility Procedures							
1.	Staff Recruitment/Promotion	<i>Recruitment not done, in most cases people are simply withdrawn or sent via letter received from PWO or HeadOffice</i> <i>Promotion is a process in the HO and seems to be very slow</i>						
2.	Defaulters Handling	<i>If no payment, disconnection and issue left at that</i> <i>Illegal Re-connection: just disconnect from the T, calculate the suspected consumption and threaten with arrest.</i> <i>Disconnected accounts are physically checked if possible, BUT systematic counterchecking is NOT possible as there is no transport.</i>						
3.	Administration Are debtors maintained monthly?	<i>No, but GOK debtor consumers are prepared quarterly.</i> <table style="width:100%; border:none;"> <tr> <td style="text-align:left;"><i>3/00:</i></td> <td style="text-align:center;"><i>12/99</i></td> <td style="text-align:right;"><i>9/99</i></td> </tr> <tr> <td style="text-align:left;"><i>8,623 Tkshs</i></td> <td style="text-align:center;"><i>8,192 TKshs</i></td> <td style="text-align:right;"><i>8,260 TKshs</i></td> </tr> </table> <i>48,263TKshs 46,432TKshs 44,503 TKshs</i> <i>GOK OTHERS</i> <i>BUT the monthly return with carried forward balances has different figures!!</i>	<i>3/00:</i>	<i>12/99</i>	<i>9/99</i>	<i>8,623 Tkshs</i>	<i>8,192 TKshs</i>	<i>8,260 TKshs</i>
<i>3/00:</i>	<i>12/99</i>	<i>9/99</i>						
<i>8,623 Tkshs</i>	<i>8,192 TKshs</i>	<i>8,260 TKshs</i>						

	<p>Is an aging analysis available?</p> <p>Debtors lists for different Consumer categories?</p> <p>Accounting Manual or computerised? If manual elaborate: Double Book keeping done Ledger cards</p>	<p>No</p> <p>No, only GOK and others, but no summaries available, all information is normally abstracted from consumer ledgers</p> <p>Manual</p> <p>There is only AIE to be accounted for</p> <p>No</p> <p>Ledger cards mainly for procurement and consumer ledgers</p>
4.	Funding	<p>A.I.E. is 60%, which can take upto 4 months</p> <p>Refer to Table 8.5.2.</p> <p>Collected Revenue at the DC office. Information collected once a week. Collection Confirmation then attached to the A.I.E. request and forwarded to Nbi. When A.I.E. approved it still requires the liquidity at the District Treasurer level to be able to issue the cheques for the suppliers. But GOK procurement procedure has to be in place already. No other source of income</p> <p>How monies were spent in relation to the WSSystem only, still requires more analysis, not readily available</p>
5.	Installment Payment	Yes, possible
6.	Meter Reading & Billing:	<p>Statement: 90 % of the meters are read</p> <p>MR done on plain paper, no identification in the field problem. All locations known by the readers,</p> <p>After manually producing the bill, if stationery available, if not calculated bill only entered into the consumer ledger, but bill might be issued when stationery available</p> <p>However calculated debit is always entered into the consumer ledger, irrespective of whether bill was issued or not. Calculators are not available.</p> <p>Bills in Meru are hand delivered</p>
7.	Disconnection	<p>Revenue Department provides those consumer lists to dis-connect, Officer i.Ch. authorises the list and sends officers to the field</p> <p>Meter is removed and taken to the office, connection is plugged but not sealed</p> <p>No follow-up procedure on disconnected consumers is in place.</p>
8.	Meter Servicing & Servicing of lines and Appurtenances	<p>No system in place; the consumer reports that meter blocked and then they clean(flush).</p> <p>No meter clinic as no tools and no parts</p> <p>Line patrol supposed to be there, but no system</p> <p>Other problems are attended to when they arise</p>
9.	HQ Reporting?	Only DWO and forms that are required to be sent

10.	Procedure Manuals?	No,
11.	Financial Control	<i>There is no financial control, as consumer payments go to the District Treasurer and expenditure is through A.I.E However no figures summarised. Everything is somewhere, somehow available, but the physical exercise involved requires a lot of time</i>
12.	Cash/Cheque Un-accounted for cash advances? Consumer payments into consumer accounts? Cash/Bank book maintained and up to date?	<i>N/A Yes, daily visit to the District Office and consumer brings the receipt. This is entered into the payment ledger and then transferred daily into the consumer ledgers. No, N/A</i>
13.	Reconciliation For Cash? For Bank?	<i>No No</i>
D.	Discussions	
1.	Staff Awareness of operation and financing cost vs turnover? Job satisfaction and expectation? Existing constraints? Physical Financial Institutional Political Personnel Efforts made to overcome the constraints? Consumer relationship? Relationship with PWE? Relationship with Ministry? Relationship with LA? Planning Department? With other utility providers? External influence affecting the performance?	<i>No Lacking facilities, no transport, no tools, no parts, no stationary, NO CALCULATOR frustrate and new DWO does not involve others in Charge transparently, i.e. if A.I.E comes how do we spend? What has highest priority etc. Yes, many No transport Not available, when needed Procurement procedures No Give time, even though there is no OT payment Efforts are made to get more curtesy into the staff; cases where staff were removed into divisions (seems to be a punishment) No relationship Nothing apart from personnel issues in Nairobi None No No Retrenchment has worked on the moral of staff</i>

	<p>Working environment?</p> <p>What is the opinion about PSP?</p>	<p><i>Ok, but same job category, same pay, but totally different duty, i.e. live in the division easy, but D.Office you cannot even go on leave</i></p> <p><i>Supported, if it has the right salary.</i></p> <p><i>Would be a machinery for discipline</i></p> <p><i>Comment on Council: They want to do the water, but they are even big defaulters themselves, and it did not work before.</i></p> <p><i>Salary Expectations: up between 200 and 300 %</i></p>
2.	<p>Consumers</p> <p>Comments on:</p> <p>Reliability</p> <p>Quality</p> <p>Billing</p> <p>Price</p> <p>Consumer requests on:</p> <p>Coverage</p> <p>Reaction Time</p> <p>Proposed changes</p> <p>Service rating</p> <p>Cost in relation to service provided?</p> <p>Tapped vs kiosk?</p> <p>View and understanding of PSP?</p> <p>What does the consumer expect?</p> <p>What does the consumer propose?</p> <p>What is his/her situation on rationing?</p>	<p><i>No time for consumer visits</i></p>
3.	<p>Stakeholders</p>	<p><i>Not possible within the time frame</i></p>
E.	<p>Consumers</p>	
1.	<p>Consumer Portfolio</p> <p>Total number?</p> <p>Ratio Major/minor consumers?</p> <p>Consumer classification</p> <p>Consumer categories?</p> <p>No. of new connect. Applied?</p> <p>No of new connect. Done?</p> <p>Percentage of suspected illegal connections?</p> <p>Coverage water?</p> <p>How many Kiosks are in operation?</p> <p>Coverage Sanitation?</p>	<p><i>Done by the council</i></p>
2.	<p>Consumer Indices</p>	<p><i>No information available</i></p>
3.	<p>Consumer Procedures</p> <p>Open account?</p>	<p><i>Consumer gets copy of application form, fills the form, i.Charge sends to zonal officer, goes out with consumer for the survey, reports back to the i.Charge; if technically possible, consumer has to pay for deposit and connection fee at DC's office. On return and prove of payment, he is</i></p>

	<p>Close account?</p> <p>Get a credit into the next bill?</p> <p>Change address?</p> <p>Transfer account?</p>	<p>given connection and account number and a page in the consumer ledger is allocated. Consumer has to bring meter Application form taken for comparison..... Consumer sees O.i.Ch., sends officer to the field to take meter reading, consumer has to clear balance and the invoice to the last reading. On evidence of payment and deposit slip consumer is sent to DC's office for deposit. However happens rarely. No information on how deposit refunding happens, they assume that consumer gets it from the DC's place. No form available. Manual system, credit can be issued, but only through approval of Head of Revenue or Officer i. Charge. Not an issue, as all hand-delivered</p> <p>Connection number retained, but A/C number is changed. It is ensured that account balance has been cleared. In case of transferred Civil Servants, they have to clear at least part of the old bill. Now a days they involve the landlord. No clear statement on how.</p>
F.	Technical System	
1.	<p>System Components?</p> <p>Is pumping necessary?</p>	<p>4 Intakes: Kathita River – T-Works, - Distribution lines (35 km) Gatabora x 2 – T-Works - High Water Tanks ASK – ASK showground Only for the ASK, Kaithe band Kaaga zones, however pumps currently broken down, Otherwise n pumping</p>
2.	<p>Zonal Meters</p> <p>How many are in the system?</p> <p>Are they controlling areas?</p> <p>Are they functioning?</p>	<p>None</p> <p>N/A</p> <p>N/A</p>
3.	<p>Network</p> <p>Transmission lines?</p> <p>Distribution lines?</p> <p>Consumer lines?</p> <p>Whole system coverage?</p> <p>Fully utilised?</p>	
4.	Coverage	
G.	Technical Indices	
1.	<p>Production</p> <p>Capacity per day</p> <p>Actual per day</p> <p>Production Efficiency?</p>	<p>?</p> <p>?</p> <p>?</p>
2.	Pumping Efficiency	N/A
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?	<i>It depends whether they have parts</i> <i>?</i> <i>N/A, as no zonal meters</i>
5.	Sanitation Treatment Capacity Actual	<i>?, as under Council, but said not to be really operating, sludge not removed for long, overflow which finally lands in the stream</i>
H.	Technical Procedures	
1.	O&M	<i>No procedures in place, neither how to fix a meter, repair a pipe etc, as normally no parts in stock, spanners, pipewrenches, dystock not available</i>
2.	Rationing	<i>Yes and certain areas are not reached at the moment</i>
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?	<i>No stock, no list, parts only when need arises</i> <i>Problem: if procure, procure for the whole district</i> <i>N/A</i> <i>There, but no equipment or tools</i> <i>No, but if need really arises i.Charge goes and does a volumetric test at the consumers place</i> <i>?</i> <i>Not possible</i> <i>Very rare and if done not charged for.</i> <i>N/A, as there is nothing</i>
4.	Requisition Procedures	<i>Officer i.Charge prepares the requirements, forwards to DWO, forwards through supplies officer who prepares in line with GOK procedure manual.</i> <i>However with the help of merchants it can take one or two days, but for big items LPO procedure which can take upto 3 months</i>

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

Total No. Of Connections	ARREARS (Kshs.)	JULY BILL (Kshs.)	CONSUMER NEVER CONNECTED	METERED	FLAT RATE	WORKING	NON-WORKING	NO WATER	CUT OFF	ACTUAL CONSUMPTION (JUNE 2000) M3	ESTIMATE CONSUMPTION M3	LAST PAYMENT (Kshs.)
3,225	20,412,091.50	1,144,603.00	-	2,644	463	272	2,225	635	799	17,178	42,786	4,562,749.00
Total Of active accounts			1,603									
No. Of Actual Bills	87											
No. Of Estimate Bills	1,516											
Assumed In-Active	1,622											
Consumer Never Connected	-											
Total	3,225.00											
Minimum Charge Bills	15.43%											

Adjustments:	(a)	(b)
	(536)	(14,908.00)

ARREARS (Kshs.)	JULY BILL (Kshs.)	CONSUMER NEVER CONNECTED	METERED	FLAT RATE	WORKING	NON-WORKING	NO WATER	CUT OFF	ACTUAL CONSUMPTION (JUNE 2000) M3	ESTIMATE CONSUMPTION M3	LAST PAYMENT (Kshs.)
20,412,091.50	1,144,603.00	-	2,644	463	272	2,225	635	263	2,270	42,786	4,562,749.00
Total m3 Billed:										45,056	

NOTE: In most billed cases both actual and estimated consumption were entered for the same accounts. The actual consumption has therefore been revised downwards in consideration of this. The integrity and completeness of the data cannot be guaranteed due to the often inadequate and conflicting condition of the raw data received. For example:
 - The majority of the disconnected accounts have reported consumptions and bills, whilst other disconnected accounts have either a bill without consumption or consumption without bills.
 THEREFORE:

- a) 536 of the reported disconnected accounts are excluded as they either have been billed, or they reflect an actual or estimate consumption, but have not been billed.
- b) 14,908 cbm was double-booked on accounts as both an actual and an estimate consumption. The actual consumption has therefore been reduced by this amount. The derived actual reduced consumption must therefore be considered as correct, although the estimate consumption is an estimate.
- c) Where actual and estimate consumption are both indicated on a bill, but with differing volumes, the actual consumption information was disregarded.
- d) 110 actual bills contradicts the statement that 272 meters are working. The information requires further re-confirmation because 105 out of 272 working have an actual consumption, but no bill; further 57 are indicated as cut off, leaving 110 accounts for which the actual consumption was considered.

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

A/C No.	CONNECTION No.	ARREARS (Kshs.)	JULY BILL (Kshs.)	CONSUMER NEVER CONNECTED	METERED	FLAT RATE	WORKING	NON-WORKING	NO WATER	CUT OFF	CUT OFF DATE	PREV MONTH CONSUMPTION (JUNE 2000) M3	AVERAGE CONSUMPTION M3	LAST PAYMENT (Kshs.)	DATE OF LAST PAYMENT
ZONE 10															
3038	3283X	16,278.00	375.00			1						17	17		
3271	3414X	4,001.00	375.00			1						17	17	2,000.00	9/5/00
3488	3521X	3,765.00				1						17	17		
8009	3258X	620.00	375.00			1						17	17	1,968.00	1/4/99
8015	3262X		375.00			1						17	17	375.00	26/7/00
8016	3263X	375.00	375.00			1						17	17	1,600.00	27/6/00
8017	3264X	3,918.00				1						17	17	2,060.00	6/3/98
8018	3265X	16,884.00	375.00			1						17	17		
8019	3266X	16,884.00	375.00			1						17	17		
8020	3267X	10,860.00	375.00			1						17	17		
8021	3268X	16,884.00	375.00			1						17	17		
8022	3269X	2,460.00	375.00			1						17	17	1,722.00	24/8/99
8023	3270X	16,884.00	375.00			1						17	17		
8024	3271X	16,884.00	375.00			1						17	17		
8025	3272X	16,884.00	375.00			1						17	17		
8026	3273X	16,884.00	375.00			1						17	17		
8027	3274X	16,917.00	375.00			1						17	17		
8028	3275X	16,917.00	375.00			1						17	17		
8029	3276X	16,278.00	375.00			1						17	17	680.00	1/7/94
8032	3279X	12,380.00	375.00			1				1	24/1/99	17	17		
8035	3280X	16,278.00	375.00			1						17	17		
8036	3280X	16,278.00	375.00			1						17	17		
8037	3282X	16,278.00	375.00			1						17	17		
8039	3284X	16,278.00	375.00			1						17	17		
8042	3285X	16,278.00	375.00			1						17	17		
8043	3286X	7,732.00	375.00			1						17	17	200.00	15/2/94
8044	3287X	17,139.00	375.00			1						17	17	163.00	7/1/93
8045	3288X	16,278.00	375.00			1						17	17		
8047	3288X	16,278.00	375.00			1						17	17		
8048	3290X	16,278.00	375.00			1						17	17		
8049	3291X	16,278.00	375.00			1						17	17		
8050	3292X	17,139.00	375.00			1						17	17		
8051	3293X	17,159.00	375.00			1						17	17		
8052	3294X	16,278.00	375.00			1						17	17		
8053	3295X	18,210.00	375.00			1						17	17		
8054	3296X	17,820.00	375.00			1						17	17		
8055	3297X	17,670.00	375.00			1						17	17	280.00	31/1/94
8056	3298X	17,820.00	375.00			1						17	17		
8057	3299X	17,820.00	375.00			1						17	17		
8059	3301X	17,616.00	375.00			1						17	17	163.50	4/1/93
SUB-TOTAL		551,842.00	14,250.00	0	0	40	0	0	0	1	1	680	680	11,211.50	

MERU

BILLING AND REVENUE COLLECTION DATA

TABLE: 8.3.2.

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	40,094,320.50	39,834,099.50	39,132,955.50	38,590,228.50	38,066,052.50	37,347,587.50
Current month billed revenue	1,203,181.00	1,205,004.00	1,201,217.00	1,270,987.00	1,274,338.00	1,271,614.00
Total revenue collectable	41,297,501.50	41,039,103.50	40,334,172.50	39,861,215.50	39,340,390.50	38,619,201.50
Accumulated FY collection	6,353,661.50	5,408,878.50	4,908,805.50	4,180,545.50	3,430,383.50	2,877,234.50
Total outstanding revenue	40,869,186.50	40,094,320.50	39,834,099.50	39,132,955.50	38,590,228.50	38,066,052.50

YEAR 1999

	DECEMBER	NOVEMBER	OCTOBER	SEPTEMBER	AUGUST	JULY
Accumulated Debt	36,830,397.00	36,530,114.00	36,052,245.00	35,647,308.00	35,275,427.00	35,258,925.00
Current month billed revenue	830,985.00	824,379.00	826,134.00	827,067.00	828,116.00	829,236.00
Total revenue collectable	37,667,362.00	37,354,493.00	36,878,379.00	36,474,375.00	36,103,543.00	36,088,161.00
Accumulated FY collection	2,557,459.00	2,039,363.00	1,691,098.00	1,268,968.00	812,733.00	
Total outstanding revenue	37,347,587.00	36,836,397.00	36,530,114.00	36,052,245.00	35,647,308.00	35,275,427.00

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	40,094,320.50	39,834,099.50	39,132,955.50	38,590,228.50	38,066,052.50	37,347,587.50
Current month billed revenue	1,203,181.00	1,205,004.00	1,201,217.00	1,270,987.00	1,274,338.00	1,271,614.00
Total revenue collectable	41,297,501.50	41,039,103.50	40,334,172.50	39,861,215.50	39,340,390.50	38,619,201.50
Actual collection	428,315.00	934,783.00	500,073.00	728,260.00	750,162.00	553,149.00
Accumulated FY collection	6,353,661.50	5,408,878.50	4,908,805.50	4,180,545.50	3,430,383.50	2,877,234.50
Total outstanding revenue	40,869,186.50	40,094,320.50	39,834,099.50	39,132,955.50	38,590,228.50	38,066,052.50

YEAR 1999

	DECEMBER	NOVEMBER	OCTOBER	SEPTEMBER	AUGUST	JULY
Accumulated Debt	36,830,397.00	36,530,114.00	36,052,245.00	35,647,308.00	35,275,427.00	35,258,925.00
Current month billed revenue	830,985.00	824,379.00	826,134.00	827,067.00	828,116.00	829,236.00
Total revenue collectable	37,667,362.00	37,354,493.00	36,878,379.00	36,474,375.00	36,103,543.00	36,088,161.00
Actual collection	319,775.00	518,096.00	348,265.00	422,130.00	456,235.00	812,733.00
Accumulated FY collection	2,557,459.00	2,039,363.00	1,691,098.00	1,268,968.00	812,733.00	
Total outstanding revenue	37,347,587.00	36,836,397.00	36,530,114.00	36,052,245.00	35,647,308.00	35,275,427.00

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

1. G.O.K

CONSUMER NAME	ACCOUNT NUMBER	OUTSTANDING AS AT JUNE 2000
Kenya Police - Meru	23	1,370.00
Kenya Police - Meru	69	No arrears stated
Kenya Police - Nkubu	7	No information
Kenya Police - Timau	307	No information
D. O. Meru	9121	No arrears stated
D.C.A / Police lines - Meru	2493	2,528,338.00
A.P. Lines - Mwimbi	779	500.00
A.P. Lines - Nkubu	2	No information
A.P. Kinoro chief camp - Mwimbi	1277	No information
Chief camp - Timau	262	No information
Mitunguu chief camp	131	No information
A.P. Line - Kanyakine	73	2,883.00
Meru D. Hospital	1173	2,940,715.00
	3226	2,024,664.00
Timau Health Centre	3103	No information
Mutiokiamama Health Centre - Kanyakine	315	No information
Kihatu Dispensary - Kanyakine	45	533.00
Mitunguu Dispensary - Mitunguu	165	3,680.00
Kinoro Dispensary - Mwimbi	1913	No information
Gatuntune Health Center - Mwimbi	2076	No information
State counsel - Meru	32	9,171.00
Law Courts - Nkubu	905	No information
Senior Resident Magistrate - Meru	677	8,220.00
Publi Works - Meru	18	88,590.00
Publi Works - Mwimbi	1655	No information
Publi Works - Mitunguu	25	No information
Kenya Prisons - Meru	56	8,892.00
Information Office - Meru	1736	7,303.00
Vetrinary - Meru	3262	No information
Vetrinary - Meru	2660	No information
Agriculture - Meru	7916	6,121.00
Agriculture - Mitunguu	405	No information
Kinoro tea factory - Mwimbi	2080	No information
Agriculture - Mitunguu	129	No information
Municipal Council Meru	2241	258,375.00
Meru Municipality Childrens clinic	8059	17,616.00
County Council of Meru	2081	5,398.00
County Council of Meru	1132	53,527.00
County Council of Meru	249	14,140.00
Igoji T. T. College - Mwimbi	757	No information
Nkabune Girls T. T. Inst. - Nkabune	20	No data
Sub - Total:		7,980,036.00

Total outstanding minor consumers	1,955,604.50
Total outstanding major consumers	18,456,487.00
Total outstanding as at June 2000	<u>20,412,091.50</u>
Number of billable connections	1603
Number of minor consumer connections	1479
Number of major condsumer connections	124
Average outstanding / minor consumer	1,322.25
Average outstanding / major consumer	148,842.64

Note:

No information :- No information available as account not in the raw data received from field.

No arrears stated:- Raw data information does not indicate the arrears

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

2. OTHER (With consumption > 100m³ per month or arrears >Kshs.20,000.00)

Extracted from base data absorbed from consumer ledgers in Meru for june 2000.

ACCOUNT NUMBER	OUTSTANDING AS AT JUNE	ACC OU	OUTSTANDIN G AS AT JUNE
2919,,	12,760.00	2679,,	23,830.00
		893	25,910.00
117	25,325.00	1149	24,242.00
652	4,825.00	1499	28,210.00
1945	7,825.00	4969	24,350.00
2241	258,375.00	7879	26,240.00
3498	58,935.00	8063	26,621.00
6857	18,025.00	8203	20,955.00
7899	3,650.00	8219	228,316.00
7922	3,850.00	0459,,	26,680.00
8160	74,085.00	2119,,	23,785.00
8415	16,070.00	8749,,	43,985.00
28749,,	43,985.00	29,,	20,750.00
3394X	228,316.00	6101	4,400.00
1945	7,825.00	3670	21,817.00
22205	3,650.00	3300	28,868.00
362	3,850.00	4658	20,183.00
12679	23,830.00	4783	22,475.00
29089	28,448.00	4926	40,370.00
3235	no arrears stated	4554	30,461.00
158	67,900.00	4498	30,225.00
1351	147,141.00	4645	25,118.00
277	106,694.00	4579	75,869.00
266	36,958.00	4721	94,921.00
7020	25,243.00	183	20,540.00
29089,,	28,448.00	4210	8,500.00
6204	23,955.00	3226	2,024,664.00
3200	20,078.00	1173	2,940,715.00
7448	20,874.00	8256	42,225.00
6853	22,403.00	3711	23,455.00
7087	22,208.00	7988	37,900.00
7106	27,862.00	4211	34,220.00
6689	25,151.00	1132	53,527.00
8325	33,120.00	2600	22,900.00
8963	11,500.00	3717	12,750.00
9081	20,620.00	3552	21,703.00
3763	12,850.00	1620	27,527.00
8078	38,600.00	6828	26,185.00
50	42,000.00	6778	24,307.00
8320	no arrears stated	7253	20,295.00
18	88,590.00	7460	22,295.00
2493	2,528,338.00		
Sub - Total:			10,476,451.00
Total:			18,456,487.00

REVENUE, A.I.E. : ALLOCATION AND EXPENDITURE

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

MONTH	REVENUE COLLECTED FY 99/00	A.I.E. APPLIED FOR	RECEIVED ALL/LIQUIDITY	EXPENDITURE INCURRED FY 99/00		ACTUAL
				ITEM	ALLOCATED	
July	913,614.50			New water connections	233,180.00	233,177.40
August	563,771.00		740,000.00	Transport & Operating Exp.	440,000.00	314,766.20
Sept.	658,240.00		970,000.00	Passage & Leave Exp.	60,000.00	59,642.70
Oct.	453,060.00			Travelling & Accom. Exp	420,000.00	419,435.00
Nov.	698,668.00		780,000.00	Fuel & Gas	394,700.00	394,071.25
Dec.	406,656.00		1,020,000.00	Purchase of Stationery	130,000.00	129,994.40
Jan.	815,331.00		440,000.00	Postal & Telegrams	40,000.00	39,886.60
Feb	910,295.00		939,440.00	Purchase of Uniforms	22,000.00	22,000.00
March	849,023.00			Renewal of W/S (fittings)	500,000.00	498,743.00
April	614,068.00		50,000.00	Maintenance of buildings & stat.	40,000.00	39,987.00
May	1,064,857.00			Maintenance of Water Supplies	414,560.00	414,554.00
June	505,749.00			Telephone	190,000.00	189,999.85
Total	8,453,332.50		4,939,440.00	Transport Operating Exp.	140,000.00	139,200.00
Meru only	6,771,976.00	approx. 80.11%	3,956,985.00	Purchase of meters	80,000.00	79,800.00
				Misc. Other charges	5,000.00	4,997.00
				Maintenance of Water Supplies	1,830,000.00	1,829,466.00
				Total	4,939,440.00	4,809,720.40
				Balance	3,956,985.38	129,719.60
					Apply 80.11% for Meru only	3,853,067.01

Percentage allocated to Meru as A.I.E. is 60%

- 1) Collection meru water supply * 60% of 6,771,976.00 = 4,063,185.60, which could have been applied for.
- 2) If only 80.11 % out of the district revenue is collected by Meru water supply, the same percentage could be applied to the AIE received, which is 80.11% on 4,939,440.00 = 3,956,985.00.
- 3) If 80.11% is again applied on the actual expenditure, it would result in a proportioned expenditure for Meru water supply of Kshs. 3,853,067.00.

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

MONTH	ORDERED(TONNES)			RECEIVED(TONNES)		
	Alum	TCL	S/Ash	Alum	TCL	S/Ash
Jul-99						2.25
Aug-99						
Sep-99						
Oct-99						
Nov-99						
Dec-99						
Jan-00				6.5		
Feb-00					11	
Mar-00						
Apr-00						
May-00				4		
Jun-00				1		28
Total	0	0	0	11.5	39	2.25
Value:				391,000.00	136,500.00	44,550.00

nothing received, as ordered & received before the FY99/00. However now used 2.25 tons even though the information is believed not to be comprehensive.

TOTAL: 572,050.00

Note: Orders are made such that verbal information is given by Supplies officer to DWO who then requests for it from HQ. No information was therefore found on ordered chemicals

APPENDIX K3

GENERAL

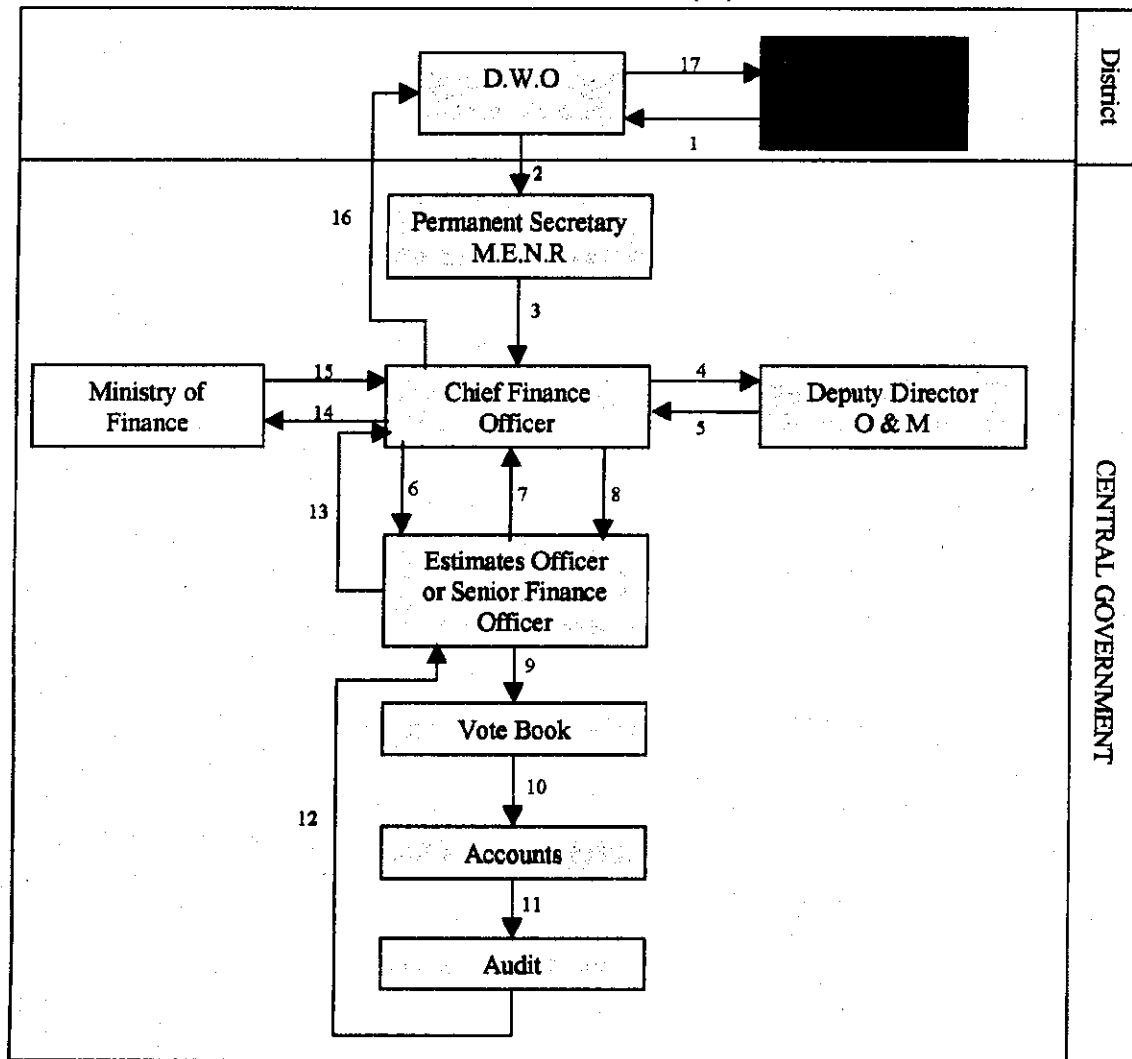


A.I.E PROCESSING CHART

FIGURE: 8.2

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

A.I.E = Authority to Incur Expenditure

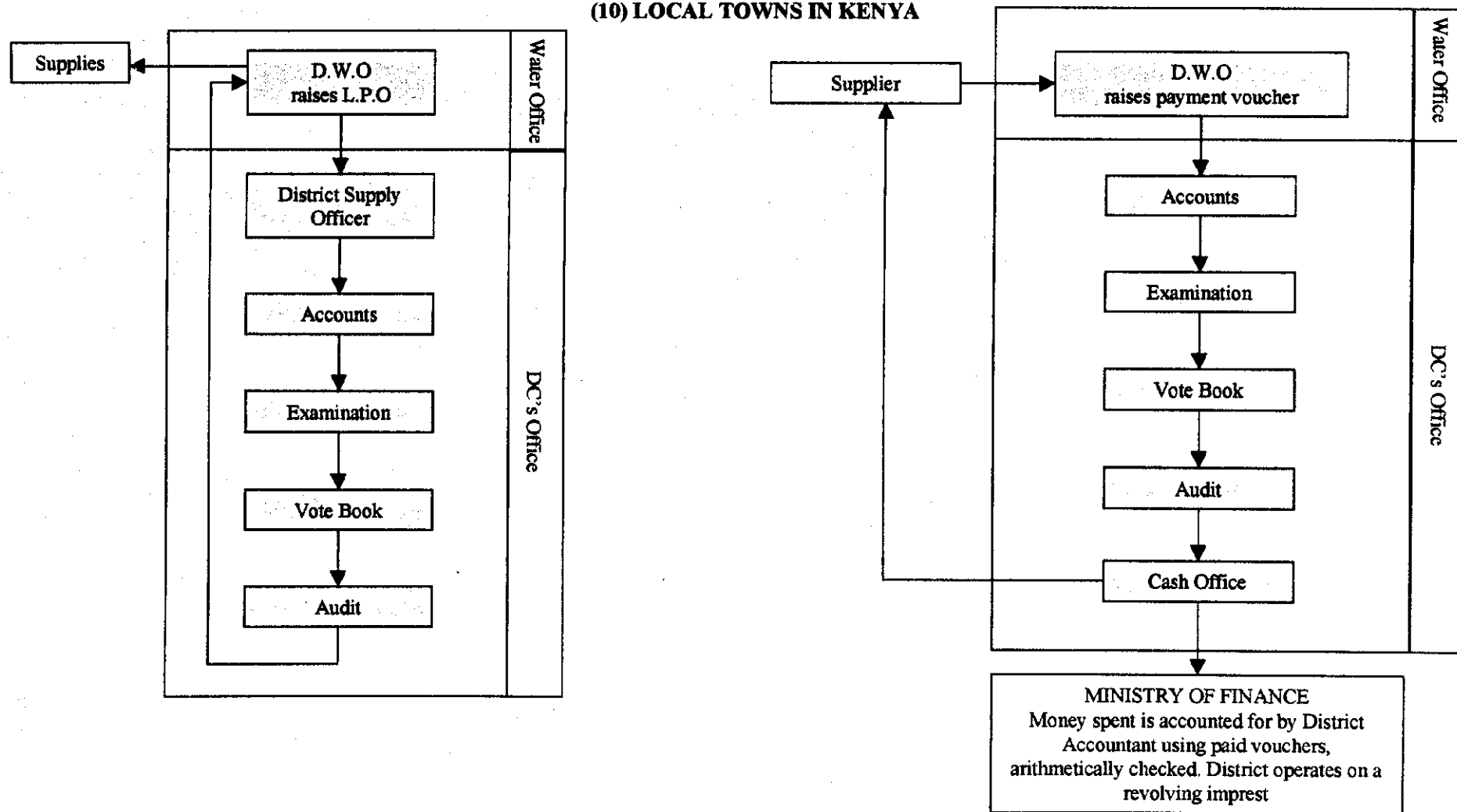


- 1) DC forwards form F.O. 17 to the DWO containing the total monthly collection made on behalf of the water department.
- 2) DWO requests for A.I.E based on form F.O. 17 collection and A.I.E percentage and forwards to P.S. The A.I.E percentage depends on the district and is determined by MENR. The percentage for the towns covered varies from 63% to 90%.
- 3) Permanent Secretary forwards request to Chief Finance Officer.
- 4) Chief Finance Officer forwards request 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) Estimates Officer forwards documents to Chief Finance Officer.
- 8) Chief Finance Officer signs and returns documents to Estimates Officer
- 9) Estimates Officer forwards documents to Vote Book for entry against the budget provision.
- 10) Vote Book Officer forwards document to Accounts for checking.
- 11) Accounts forwards documents to Audit for checking.
- 12) Audit forwards documents to Estimates 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



Engineering and Utility Management Ltd.

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: MALINDI
10.11.2000**

Sub-Area Office NWCPC

Management Contract H.P.Gauff in association with Gauff Utility

Interviewer: LEK and CK

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**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:
<p>GENERAL:</p> <p>Contract in place?</p> <p>Line of Command?</p> <p>Any comments on current situation?</p> <p>Problems experienced?</p> <p>Any recommendation on changes to improve the situation?</p> <p>Cause of the problem if any?</p> <p>Any problems on Fee payments?</p>	<p><i>Yes</i></p> <p><i>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)</i></p> <p><i>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</i></p> <p><i>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.</i></p> <p><i>Procurement issues should be simplified 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</i></p> <p><i>Government and Parastatal guidelines and procedures and the Water Act (Criminal case first, Civil case second...)</i></p> <p><i>No, standing order to cover fee and O&M is paid from the collection account, balance at end month goes to NWCPC</i></p>
<p>FINANCES:</p> <p>Is the management financially independent?</p> <p>Can collected revenue sustain the operation?</p>	<p><i>In principle yes, but with limitations on procurements.</i></p> <p><i>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</i></p>

<p>How is revenue collected?</p>	<p><i>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.</i></p> <p><i>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.</i></p>
<p>OPERATION:</p> <p>Any interference in the day to day operation?</p> <p>Procedures manifested already ?</p>	<p><i>No, but biggest impediment is the procurement which has to follow the standard Government procedures</i></p> <p><i>No, but best practice in the circumstances is applied for O&M and Financial issues. Later on these will be pu into user manuals</i></p>
<p>STAFF:</p> <p>Relationship with the NWCPC/Management staff?</p> <p>Are any incentives offered to improve the output?</p>	<p><i>Staff mixed between NWCPC and management. Staff then seconded to the management consultant.</i></p> <p><i>Total: approx. 70 with ratio: 50 Consultant / 20 NWCPC</i></p> <p><i>Yes</i></p>
<p>RECOMMENDATIONS:</p> <p>For other management contracts?</p>	<p><i>1. Operator/Manager to have sufficient autonomy.</i></p> <p><i>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.</i></p>



Development Impact Consulting



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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

Date: 20.12.00

Fax: 0171-2734

Interviewer: **LEK**

.....

Telephone Interview held with: MD : Eng. Nguiguti

NYERI WATER COMPANY NYEWASCO

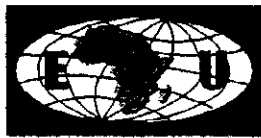
<p>Any comments on current situation?</p> <p>Any recommendation on changes to improve the situation?</p> <p>Cause of the problem if any?</p> <p>Agency agreement between company and Council finalised?</p> <p>Ownership of the company clear?</p> <p>Any advice for other water companies to integrate into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

<p>Any other problems encountered?</p>	<p><i>and new works</i></p> <p><i>Intereferance of running of the company by the council, however this is now decreasing.??????</i></p>
<p>Relationship between CMT and Board?</p> <p>Relationship CMT/Board/ Council?</p> <p>Any interference in the day to day operation?</p> <p>Is day to day operation autonomous as far as CMT is concerned?</p> <p>How is the relationship with the consumers? Has the situation improved?</p>	<p><i>Government ??????</i></p> <p><i>There has been a problem as the council has tried to interfere with the work of the board however, the council has not succeeded.</i></p> <p><i>No.</i></p> <p><i>Yes.</i></p> <p><i>Customers are much happier with the service rendering by the company.</i></p>
<p>Relationship with the staff? All former staff absorbed?</p> <p>Conditions under which staff were absorbed?</p> <p>Retired on the Council side?</p> <p>Have staff salaries changed since take over? How?</p>	<p><i>All former staff were absorbed however, their salary expectations have not been met</i></p> <p><i>All had to be absorbed. Their retention then by the company depends on their performance.</i></p> <p><i>No.</i></p> <p><i>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.</i></p>

Are any incentives offered to improve the output?	<i>Incentives are being worked out.</i>
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LAWGIBB Group Member 

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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

<p>Any comments on current situation?</p> <p>Any recommendation on changes to improve the situation?</p> <p>Cause of the problem if any?</p> <p>Agency agreement between company and Council finalised?</p> <p>Ownership of the company clear?</p> <p>Any advice for other water companies to integrate into their agency agreement?</p>	<p><i>Very difficult</i></p> <p><i>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)</i></p> <p><i>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</i></p> <p><i>No access to loan facilities and burden of honouring liabilities taken over from the former operator (Council)</i></p> <p><i>No</i></p> <p><i>Yes</i></p> <p><i>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</i></p>
<p>Does the company have an Opening Balance Sheet?</p> <p>How were assets handeled?</p> <p>How were Consumer outstanding balances handeled?</p> <p>How were liabilities handeled? (Power, Creditors)</p> <p>Is the company financially independent?</p> <p>Can collected revenue sustain the operation?</p>	<p><i>Working on it</i></p> <p><i>Proposed all retained by the Council. Proposal from UWASAM for lease amount for the assets, not discussed with Council yet</i></p> <p><i>Taken over as they were</i></p> <p><i>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</i></p> <p><i>Yes, in so far as own bank a/c, and Council is not involved at all.</i></p> <p><i>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.,</i></p> <p><i>Applied to CIM grant for new meters, additional funds</i></p>

<p>Any other problems encountered?</p>	<p><i>hoped for from KfW loan – but earliest 2 nd half of next year. Fitting of meters for non- metered accounts into priority one.</i></p> <p><i>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</i></p> <p><i>Portfolio: mainly domestic, apart from prison and police All GOK bodies have a payment problem, delays</i></p> <p><i>Supply:</i></p> <p><i>Water shortage, cut off power (1 mio current 600 arrears), then used diesel, diesel from collection 10 hours pumping For 3800 cbm/day</i></p> <p><i>Agricultural consumers, i.e. seasonal payments like the month of March, which requires money for planting, no payment of water.</i></p> <p><i>KCC closed one of the major consumers</i></p> <p><i>If 80 % is collected</i></p> <p><i>Network rehabilitated in 1992</i></p>
<p>Relationship between CMT and Board?</p> <p>Relationship CMT/Board/ Council?</p> <p>Any interference in the day to day operation?</p> <p>Is day to day operation autonomous as far as CMT is concerned?</p> <p>How is the relationship with the consumers? Has the situation improved?-</p>	<p><i>MD on the Board, on interference</i></p> <p><i>Goodwill to be improved further, involve chairman into building good will</i></p> <p><i>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.</i></p> <p><i>No</i></p> <p><i>Yes</i></p> <p><i>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,</i></p> <p><i>Technically: in the network immediate attendance to a problem, but at production it is a problem.</i></p> <p><i>There are 5 pumping stations and power is the main problem</i></p>
<p>Relationship with the staff? All former staff absorbed?</p> <p>Conditions under which staff were</p>	<p><i>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)</i></p> <p><i>Letter of release from the Council however never formalised</i></p>

<p>absorbed?</p>	<p><i>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.</i></p>
<p>Retired on the Council side?</p>	<p><i>Provident Fund ? suggested to continue to pay into it, but needs to be checked whether possible or not. Again an issue that</i></p>
<p>Have staff salaries changed since take over? How?</p>	<p><i>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</i></p>
<p>Are any incentives offered to improve the output?</p>	<p><i>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)</i></p>

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: STS.2

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

DETAILS	Units	NAROK	MERU	MURANGA	KABARNET	MAKINDI	WUNDANYI	MIGORI	LAMU	WEBUYE	MUMIAS
Total Population	No.	43,000	130,100	60,000	17,600	6,400	7,200	99,700	12,000	73,000	110,400
Total Staff	No.	34	48	56		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 AC transferred to community	No.	-	-	-	-	136	-	133	-	Not available	-
Metered Accounts	No.	999	2,644	2,630	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	181	104	290	138	697	1,609	1,284
Unmetered Accounts	No.	289	483	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 85.23%	1,453 50.35%	363 63.80%	117 52.23%	192 31.19%	188 87.85%	608 86.54%	729 98.45%	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 bill	%	67.27%	15.43%	63.77%	34.54%	19.93%	67.04%	53.01%	78.14%	12.37%	16.41%
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	36,431	132,000	82,500	51,000	12,180	21,600	5,400	22,833	27,120	21,180
Production efficiency	%	60.60%	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	23,418	46,068	41,028	11,500	7,182	10,020	5,582	7,804	27,613	31,568
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	8,510	26,768	31,311
UPW June 2000	m ³	13,016	86,944	41,472	39,500	4,998	11,580	consumed > produced	15,029	107	consumed > produced
UPW	%	35.73%	85.87%	50.27%	77.48%	41.00%	63.61%		65.82%	0.39%	
Value of water lost	Kshs.	313,892.84	2,208,726.10	1,288,842.37	1,313,663.91	193,022.75	431,117.74		563,136.63	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%	22.56%	58.98%	49.58%	>100%	34.18%	99.81%	>100%
Collected revenue June 2000	Kshs.	427,020.00	428,318.00	1,109,328.00	328,123.00	88,812.00	228,728.00	32,258.00	100,838.00	178,228.00	132,888.00
Collection efficiency June 2000	Kshs.	76.91%	37.42%	86.92%	86.80%	24.12%	53.95%	34.81%	34.52%	21.99%	18.39%
Average Tariff June 2000 / m ³	Kshs.	24.12	25.40	31.06	33.26	38.63	42.31	16.67	37.47	30.04	22.87
Total Debtors end May 2000	Kshs.	8,684,102.60	20,412,091.60	12,841,260.80	1,639,628.00	6,597,732.66	3,289,054.15	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	40,084,320.60	13,808,023.90	1,539,969.00	7,317,723.10	3,718,960.00	609,915.30	2,436,479.00	355,421.00	1,552,762.00
Major consumers:											
O.O.K	%			61.42%	Not available	N/A	46.08%	Not available	Not available	0.64%	Not available
(Others Consumption >100ml or arrears >20,000.00)	%	3.26%	52.94%	10.98%	50.35%	91.60%	2.04%	15.98%	43.20%	1.40%	5.37%
Minor Consumers	%	96.74%	47.06%	27.60%	49.65%	8.40%	51.98%	84.02%	56.80%	97.96%	94.63%
A/E percentage	%	64%	60%	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		2,173,735.00	730,954.00	1,295,717.00	2,163,140.00	
A/E earned FY 99/00	Kshs.	2,449,585.82	4,063,185.60	6,010,847.38	N/A		1,412,828.70	476,120.10	1,196,146.30	1,382,778.20	
A/E received FY 99/00	Kshs.	1,286,880.00	3,956,986.00	6,022,660.00	N/A		2,535,300.00	823,480.00	1,269,860.00	Not available	Not available
A/E Expenditure:	Kshs: %	Kshs: %	Kshs: %	Kshs: %	Kshs: %	Kshs: %	Kshs: %	Kshs: %	Kshs: %	Kshs: %	Kshs: %
Transport & staff related expenses	Kshs.	497,238.00 38.67%	786,085.70 19.86%	1,910,296.65 38.61%	217,863.35 26.54%		344,413.26 15.81%	399,484.00 50.94%	377,321.80 29.83%		
O&M	Kshs.	534,042.00 41.63%	2,420,082.50 62.81%	2,490,246.26 60.33%	200,470.00 24.42%		1,119,580.66 51.40%	320,280.00 40.84%	864,179.50 67.53%		
Postage	Kshs.	9,922.00 0.77%	31,963.20 0.83%	22,736.00 0.46%	3,537.40 0.43%		94,960.00 4.36%	15,400.00 1.99%	16,400.00 1.48%		
Telephone	Kshs.	-	182,208.90 3.95%	86,000.00 1.11%	236,843.25 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%	66,854.00 1.33%	6,280.00 0.77%		85,000.00 3.90%	49,121.00 6.26%	14,945.00 1.16%		
Fuel & Gas	Kshs.	199,715.70 16.63%	315,690.50 8.19%	304,286.50 6.19%	157,032.00 19.13%		409,947.20 18.82%	-	-		
All Expense:	Kshs.	1,285,917.70 2	3,863,087.10 1	4,847,421.40 2	820,836.00 3		2,178,100.10 2	784,266.80 2	1,284,846.10 2		4

- x Verified Figures (Extracted from the consumer information raw data)
- x Provided figures (Extracted from O&M, Billing and revenue data and A/E data as provided and production figures from Glbb)
- 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 A/E expenditure relating to water supply only
 - 2 A/E expenditure relating to District
 - 3 Details relating to 6 months only
 - 4 Details not readily available
- Information obtained from vote book and grouped

PROBLEM – SYMPTOM – CAUSE – RECOMMENDATION MATRIX

SUMMARY TABLE: ST 8.3

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

Problems	Symptoms	Cause	Recommended Change
1. Organization Structure			
<p>Office Set-up</p> <p>Lack of decent or sufficient office space, Lacking equipment, Lacking or delayed stationery, No calculators, No computers.</p>	<ul style="list-style-type: none"> • Messy office environment. lost files, limited communication. • Low staff morale. • Reduced efficiency. • Delayed billing, wrong billing calculation. • Delayed consumer problem attendance. • No data base. 	<ul style="list-style-type: none"> • Insufficient funding. • Delays in A.I.E. processing. • Centralised GOK printing. • Centralised decision-making. 	<ul style="list-style-type: none"> • Decentralise decision-making process. • Change funding procedure. • Arrange for decent office space
<p>Staffing Set-up</p> <p>Delayed promotion, No training opportunities No skill in commercial field / management, Lacking recruitment by qualification, Low remuneration, No O/T payments or compensation, Limited personnel management and control, "Technical" attendance to work.</p>	<ul style="list-style-type: none"> • Reduced efficiency. • Low staff morale. • No commercial approach. • Lacking understanding of commercial operations. 	<ul style="list-style-type: none"> • Inefficient / delayed personnel management at HQ. • Insufficient funding. • GOK recruit practice concerning commercial or managerial skill. • GOK salary scales. • Lacking organisation chart. • Lacking job description. • Favourism at HQ level. • Inefficient system of staff discipline. • Lacking personnel management and control. 	<ul style="list-style-type: none"> • Decentralise decision-making. • Change funding procedure. • Set up organisation charts with detailed job description and skill requirements • Arrange for intensive management training for Engineers or recruit well-qualified managers. • Set up positive and negative staff sanctioning system. • Use negative sanctioning as retrenchment criteria. • Limit recruitment to the system requirement, based on skill and merit.
<p>Transport</p> <p>No or limited transport</p>	<ul style="list-style-type: none"> • Certain field operations not possible. • Delayed reaction time to field operations • Reduced control over field activities 	<ul style="list-style-type: none"> • Insufficient funding • Lack of planning on Asset Maintenance i.e. grounded vehicles. • No planning on transport requirement. 	<ul style="list-style-type: none"> • Change funding procedure • Prepare criteria for transport requirements based on size of system coverage, pipe network, number of consumer e.t.c. • Decentralise decision making

PROBLEM – SYMPTOM – CAUSE – RECOMMENDATION MATRIX

Problems	Symptoms	Cause	Recommended Change
2. Organization Activities and Procedures			
<p>Consumer Management</p> <p>No application forms available, different forms used, No conditions of supply (back page not copied), Out dated format or no agreement form filled, just connected All consumer information held in consumer ledgers, No control system over new connections in the field, Different interpretation of gazette notice on new meters, No quality control on connection material and meter, semi-illegal connections</p>	<ul style="list-style-type: none"> • Insufficient consumer information • Connections not included in consumer ledger • High UfW • No legal agreement as basis for supply • Information not in compiled format • No comprehensive data base • New Flat Rate consumers. • Meters still provided through the water undertaker. • Issues kept pending due to lack of clear guidance • High rate of meter malfunction 	<ul style="list-style-type: none"> • No control of new applications • Centralised GOK printing • Delays in AIE processing • Insufficient funding • No control over consumer applications and connections / Illegal staff consumer co-operation • No regular review of GOK formats • Insufficient operating and / or outdated implementation guidelines • No guidelines and control on quality standards 	<ul style="list-style-type: none"> • Introduce administration fee for new connection application • Increase connection charges to commercial rates • Decentralise procurement of stationary • Change funding procedure • Redesign application format and other formats • Computerise consumer data base and obtain field information from all existing consumer using the re-designed application format • Design meaningful recording formats and reports. • Prepare implementation guidelines related to gazette notices and relating procedures. • Prepare guidelines on control of new connections • Stop installation of unmetered new connections • Use negative sanctioning as retrenchment criteria.

PROBLEM – SYMPTOM – CAUSE – RECOMMENDATION MATRIX

Problems	Symptoms	Cause	Recommended Change
<p>Meter Reading</p> <p>No routing for MR, On Minimum charge and still "read" monthly, Involvement of a single MR in several steps of the meter reading up to billing process, Lack of stationary, Lack of transport, unmotivated staff, Wrong meter reading</p>	<ul style="list-style-type: none"> • Low reliability of information found • High % of all connections are estimated. • High number of connections on minimum • Wrong billing 	<ul style="list-style-type: none"> • No meter reading procedure • No logic MR reading routing • No MR control in place • Unskilled staff • GOK salary scale • Insufficient funding • No motivation to boost efficiency 	<ul style="list-style-type: none"> • Design a controlled meter reading and routing process • Design zoning where necessary • Design meaningful connection referencing. • Replace meters that serve Minimum charge consumers with Flow Restriction Meters (Devices to avoid waste) • Concentrate reading meters A/C's > 10 cbm consumption and control the Meter Reading in to a meaningful effort. • Prepare staff re-organisation plan • Use negative sanctioning as retrenchment criteria.
<p>Billing</p> <p>Wrong billing, Delayed tariff implementation not retroactively implemented, Delayed stationary, Unskilled staff and no calculators, High number of estimated bills</p>	<ul style="list-style-type: none"> • Low billing efficiency • Increased UfW. • Wrongly calculated bills • Reduced collection efficiency due to consumer disputes and complaints • Inconsistent calculations • Delayed billing 	<ul style="list-style-type: none"> • No calculators • No clear instruction from HQ on gazette implementation like New deposit , Delayed tariff adjustments New meter handling • Monthly returns to HQ are never checked. • No sanctioning for inefficient and dishonest staff • Delays in AIE processing • High percentage of defective and not serviced meters 	<ul style="list-style-type: none"> • Change funding procedure • Prepare implementation instructions for gazetted changes • Consider billing software for stations with consumers > 1,000 • Control reporting procedure • Use negative sanctioning as retrenchment criteria.
<p>Dis-connection</p> <p>No disconnection material, No set disconnection criteria system, wrongly organised staff, no transport, Consumer / staff collaboration, No record maintenance, Low disconnection efforts, bills lack due date remark</p>	<ul style="list-style-type: none"> • Low collection 	<ul style="list-style-type: none"> • Delays in AIE processing • Insufficient funding • No control on disconnection / reconnection records • No follow up for years, (those consumers are simply forgotten) • No motivation to boost efficiency 	<ul style="list-style-type: none"> • Design organised disconnection program. • Design implementation and control program. • Increase deposits to the latest requirement level. • Investigate into simplified disconnection method. • Computerise for systems > 1000 consumers

PROBLEM – SYMPTOM – CAUSE – RECOMMENDATION MATRIX

Problems	Symptoms	Cause	Recommended Change
<p>Illegal Connection / Illegal re-connection</p> <p>Suspected high rate of illegal connection and re-connection, no transport</p>	<ul style="list-style-type: none"> • High UfW • Low rate of re-connection statistics. 	<ul style="list-style-type: none"> • Illegal staff / consumer collaboration • No suitable technical approach to disconnect such that no illegal re-connection possible (low income estates) • No spot checks on disconnected accounts for years, disconnected consumers are forgotten • No legal action, where consumer caught with illegal connections • Legal action difficult as case difficult to substantiate and knowledge of staff inadequate. • Police / judiciary not supportive. • Weak Water Act, penalties low and legal system open for corruption. • No clear guidance on how to deal with illegal consumers 	<ul style="list-style-type: none"> • Amend Water Act to impose stiff penalties • Amend water act to include debt recovery, including additional cost incurred. • Investigate into flow restriction meters to consumers with illegal re-connection tendencies. If account cannot be legalised, find technical approach to seal permanently. • Set clear guidelines on how to handle illegal activities • Introduce penalties for illegal consumers through the water undertaker • Use of District Bailiffs
<p>Debt Arrears</p> <p>Very high debt arrears Unreliable Records, Lacking debt substantiation, GOK the biggest debtor</p>	<ul style="list-style-type: none"> • Monthly increasing debt while no systematic disconnection • Unrealistically high monthly consumption of GOK institutions (hospital, police, prison) 	<ul style="list-style-type: none"> • No efficient and timely disconnection system • No clear HQ guidelines • Weak Water Act with no provision for debt collection. • Civil proceedings expensive on the onset to file suite. • Preferential treatment of GOK bodies • Legal action difficult as records difficult to substantiate • No motivation to boost efficiency • Old and leaking system (taps, tanks, pipes) in GOK institutions 	<ul style="list-style-type: none"> • Treat GOK bodies like any other consumer • Undertake analysis to substantiate and confirm old debts • Determine which old debtors should be written off (dead accounts, e.t.c.) • Amend GOK write off procedure (Old community accounts) • Introduce late payment penalties • Overhaul internal plumbing, piping and storage system of GOK institutions

PROBLEM – SYMPTOM – CAUSE – RECOMMENDATION MATRIX

Problems	Symptoms	Cause	Recommended Change
<p>Revenue Collection</p> <p>Wrong bills, bills lack due date remark, consumers have no payment moral</p>	<ul style="list-style-type: none"> • Low collection efficiency • High consumer complaints 	<ul style="list-style-type: none"> • Incorrect meter reading • No motivation to boost efficiency • Insufficient disconnection • No priority given to major consumers. • Weak or no debt collection systems • No efficient collection monitoring • Lacking information on cost of production and distribution of water 	<ul style="list-style-type: none"> • Control organised disconnection program. • Set up positive and negative staff sanctioning system. • Create staff and stake holder awareness on cost of production and distribution of water • Use negative sanctioning as retrenchment criteria • Design a major consumer monitoring and control system • Computerise for systems > 1000 consumers • Design a suitable, safe and consumer friendly cash collection system
<p>UFW</p> <p>Unreliable or no records on production and consumption and no information where water is lost (physical loss, wrong or no MR, illegal consumption), No transport, No materials, No tools, Poor reticulation design, Poor workmanship when laying pipe network, No quality control on material used for consumer lines, Poor installation of consumer meters , wrong and high estimated meter reading, Illegal connections</p>	<ul style="list-style-type: none"> • High UFW. • Estimated unaccounted for water, as no production figures details available • Limited supply, as high percentage of water lost 	<ul style="list-style-type: none"> • Master meters defunct or non-existent • Majority of consumer meters defunct • Poor maintenance of the reticulation system 	<ul style="list-style-type: none"> • Arrange for servicing facilities for master meters (outsource) • Install flow restriction meters • Set up servicing facility and program for consumer meters • Rehabilitate the existing network • Consider leak detection exercise, depending on the extent of project rehabilitation of the existing network

PROBLEM – SYMPTOM – CAUSE – RECOMMENDATION MATRIX

Problems	Symptoms	Cause	Recommended Change
<p>Costs</p> <p>No or limited information about cost at system level, No cost consciousness at system or HQ level, Lengthy district administration payment processing on vouchers issued by the DWO, Centralised tendering, High power bills depending on system design, inadequate tariff not cost related, but politically justifiable</p>	<ul style="list-style-type: none"> • Costs > collected revenue • Inflated tenders • Inflated costs • Very high power bills 	<ul style="list-style-type: none"> • Low billing and collection efficiency • No meaningful cost control • Vested interest in the District Tender Board and district administration • No planning, never preventive always reactive operation • Water tariff is fixed where as power tariff has a variable cost component incorporating external factors of the economy (oil price, Kshs. exchange rate) • At the time of investment operating cost were given a lesser priority than investment cost. • There is no basis for information to calculate a cost covering tariff • Water tariffs are politically sensitive, as water has no substitute • 	<ul style="list-style-type: none"> • Decentralise planning and control of cost to create cost consciousness • Involve an external consultant/ market price analyst to give annual pricing guidelines and limitations • Decentralise procurement procedure to system level • Outsource certain activities to provincial level where economies of scale are of advantage to the system • Decentralise system control to the provincial level with independent external annual auditors • Decentralise chemical procurement to system level • Negotiate reduced power tariff used for production of water
<p>Financial Control</p> <p>No HQ control over AIE is spending, No HQ control over billing,</p>	<ul style="list-style-type: none"> • AIE spending not O&M demand driven. • Priorities left to DWO's decision with control or substantiation. • No compiled information everything OK as long as procurement procedure complied with 	<ul style="list-style-type: none"> • GOK procurement procedure (district tender board) (counter productive control) • GOK reporting and control procedures not effective • Occasional internal audit checks by colleagues of the system and not effective • Disciplinary (GOK) system only transfers therefore inefficient • District Administration accounts for the AIE spent to Treasury • MENR only receives the expenditure information from treasury against the respective votes 	<ul style="list-style-type: none"> • Design a transparent reporting and accounting system within the MENR for AIE expenditure • Decentralise control to provincial level and additional independent external auditor • DWO to prepare financial plans • Use mismanagement of funds as retrenchment criteria • Use price guideline of an external consultant/ market price analyst as a control instrument • Assess and set up benchmarks for adequate use of chemicals

PROBLEM – SYMPTOM – CAUSE – RECOMMENDATION MATRIX

Problems	Symptoms	Cause	Recommended Change
<p>Stock</p> <p>Procurement procedure, shortage level, no stock management, no summarised stock movement records</p>	<ul style="list-style-type: none"> • Chronic shortage • High UFW • Questionable Water quality • Delayed attendance to source and network problems • Assistance of well-wishers (donor agencies and consumers) • Delay in all aspects of operation 	<ul style="list-style-type: none"> • Insufficient funding • GOK procurement procedure • Centralized procurement • Neglect of divisional systems 	<ul style="list-style-type: none"> • Set up stock management system and controls • Decentralise AIE procurement procedures • Decentralise procurement of chemicals to system level • Decentralise AIE funding
3. O&M Field Activities and Procedures			
<p>Consumer Meter servicing</p> <p>Lacking materials, tools and skill, No meter servicing facilities, No transport, buried meters</p>	<ul style="list-style-type: none"> • High UFW • Majority of meters estimated for billing • Low billing efficiency 	<ul style="list-style-type: none"> • No servicing schedule • No field control • Wrong priorities and AIE spending not controlled • Low staff moral • No staff planning • No technical guidance available 	<ul style="list-style-type: none"> • Improve on funding procedures • Design a routine meter servicing schedule • Arrange for staff training • Decentralise AIE funding • Decentralise procurement procedures without the District Administration • Undertake survey on servicing capacity within the province • Setup consumer meter repair workshop • Arrange for simple meter volumetric test facility. • Prepare standard consumer meter installation manual • Gradual consumer meter installation rehabilitation in line with proposed installation manual

PROBLEM – SYMPTOM – CAUSE – RECOMMENDATION MATRIX

Problems	Symptoms	Cause	Recommended Change
<p>Master Meter servicing</p> <p>Lacking materials, tools and skill, Insufficient information about the existing network</p>	<ul style="list-style-type: none"> • Lack of reliable production details 	<ul style="list-style-type: none"> • No system level skill • No parts at provincial level • No efforts made by staff • Insufficient funding 	<ul style="list-style-type: none"> • Improve on funding procedure • Outsource servicing, pegged to supply / tenders of the master meters • Look into economies of scale under provincial officer
<p>Pipe Network servicing</p> <p>No transport No tools No materials, skill, "Spaghetti" consumer lines, No location information and network plans</p>	<ul style="list-style-type: none"> • Delayed attendance to burst and leaks • High UfW 	<ul style="list-style-type: none"> • Mixed network piping material • No planned network design • No technical guidance available / manual • No preventive maintenance on network appurtenances • Insufficient funding • No stock management 	<ul style="list-style-type: none"> • Prepare a planned pipeline network with standardised materials • Ensure rehabilitation on high and controlled standard • Introduce retainer security on contracted work • Clarify and document water wayleafs • Include consumer lines into the planned network • Amend the Water Act, Transfer responsibility of the consumer line connections up to the meter from the consumer to the water undertaker. • Prepare preventive maintenance schedule and manuals
<p>Source & T-Works</p> <p>High power consumption, Power rationing, damage caused by uncontrolled power surges, system neglect</p>	<ul style="list-style-type: none"> • Pumps not working • Laboratory not operational • Water quality questionable • Dosing system not functioning • Reduced production / pumping hours 	<ul style="list-style-type: none"> • Lacking preventive maintenance • No financial planning on replacement of assets • Insufficient funding • Power tariff too high in comparison to the water tariff • No technical guidance / manual • No preventive maintenance, • No funds to repair of defective pumps 	<ul style="list-style-type: none"> • Negotiate a reduced power tariff used for water production and distribution • Investigate into the possibilities of water used to create power before it is treated and distributed • Exclude water production from power rationing • Prepare preventive maintenance schedule and manuals • Update WS operators handbook • Out-source pump maintenance • Improve funding procedure

PROBLEM – SYMPTOM – CAUSE – RECOMMENDATION MATRIX

Problems	Symptoms	Cause	Recommended Change
4. Reporting			
<p>Data is copied from one month to the next and from one year to the next, No adequate filing system for returns</p>	<ul style="list-style-type: none"> • No control nor planning tool • Information not readily available. 	<ul style="list-style-type: none"> • Outdated report format (quantity not quality) 	<ul style="list-style-type: none"> • Decentralise to provincial level • Set up a meaningful M.I.S reporting system. • Redesign current reporting system and format with filtered information for HQ

ACTION PLAN

SUMMARY TABLE: ST 8.4

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

No.	Action	Narok	Meru	Muranga	Kabarnet	Makindu	Wundanyi	Migori	Lamu	Webuye	Mumias	Utility Management Plan	Action to be taken by	Donor involvement recommended	Phase I	Phase II	Phase III
1.	Arrange for decent office space							x		x	x		MENR		→		
2.	Set up organisation charts with detailed job description and skill requirements.	x	x	x	x	x	x	x	x	x	x		Consultant		→		
3.	Arrange for intensive management training for Engineers or recruit well-qualified managers.	x	x	x	x	x	x	x	x	x	x		Consultant		→		
4.	Arrange for commercial and technical staff training	x	x	x	x	x	x	x	x	x	x		Consultant		→		
5.	Set up positive and negative staff sanctioning system.	x	x	x	x	x	x	x	x	x	x		Consultant		→		
6.	Use negative sanctioning as retrenchment criteria.	x	x	x	x	x	x	x	x	x	x		MENR			→	
7.	Decentralise personnel management to provincial / regional level												MENR			→	
8.	Limit recruitment to the system requirement, based on skill and merit.	x	x	x	x	x	x	x	x	x	x		Consultant & MENR		→		
9.	Prepare criteria for transport requirements based on size of system coverage, pipe network, number of consumer s.t.c.	x	x	x	x	x	x	x	x	x	x		Consultant		→		
10.	Redesign consumer recording and reporting formats	x	x	x	x	x	x	x	x	x	x		Consultant		→		
11.	Computerise consumer data base and consider billing software	x	x	x	x	x	x	x	x	x	x		Consultant		→		
12.	Obtain field information from all existing consumer using the re-designed application format	x	x	x	x	x	x	x	x	x	x		Consultant		→		

ACTION PLAN

SUMMARY TABLE: ST 8.4

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

No.	Action	Narok	Meru	Muranga	Kabarnet	Makindu	Wundanyi	Migori	Lamu	Webuye	Mumias	Utility Management Plan	Action to be taken by	Donor involvement recommended	Phase I	Phase II	Phase III
1.	Arrange for decent office space							x		x	x		MENR		→		
2.	Set up organisation charts with detailed job description and skill requirements.	x	x	x	x	x	x	x	x	x	x	x	Consultant		→		
3.	Arrange for intensive management training for Engineers or recruit well-qualified managers.	x	x	x	x	x	x	x	x	x	x	x	Consultant		→		
4.	Arrange for commercial and technical staff training	x	x	x	x	x	x	x	x	x	x	x	Consultant		→		
5.	Set up positive and negative staff sanctioning system.	x	x	x	x	x	x	x	x	x	x	x	Consultant		→		
6.	Use negative sanctioning as retrenchment criteria.	x	x	x	x	x	x	x	x	x	x	x	MENR			→	
7.	Decentralise personnel management to provincial / regional level												MENR			→	
8.	Limit recruitment to the system requirement, based on skill and merit.	x	x	x	x	x	x	x	x	x	x	x	Consultant & MENR		→		
9.	Prepare criteria for transport requirements based on size of system coverage, pipe network, number of consumer e.t.c.	x	x	x	x	x	x	x	x	x	x	x	Consultant		→		
10.	Redesign consumer recording and reporting formats	x	x	x	x	x	x	x	x	x	x	x	Consultant		→		
11.	Computerise consumer data base and consider billing software	x	x	x	x	x	x	x	x	x	x	x	Consultant		→		
12.	Obtain field information from all existing consumer using the re-designed application format	x	x	x	x	x	x	x	x	x	x	x	Consultant		→		

ACTION PLAN

SUMMARY TABLE: ST 8.4

No.	Action	Narok	Meru	Muranga	Kabarnet	Makindu	Wundanyi	Migori	Lamu	Webuye	Mumias	Utility Management Plan	Action to be taken by	Donor Involvement recommended	Phase I	Phase II	Phase III
13.	Prepare implementation guidelines related to gazette notices and relating procedures	x	x	x	x	x	x	x	x	x	x		Consultant & MENR		→		
14.	Prepare consumer and connection management guidelines	x	x	x	x	x	x	x	x	x	x		Consultant		→		
15.	Investigate replacement of Minimum charge consumer meters with Flow Restriction Meters (Devices to avoid waste)	x	x	x	x	x	x	x	x	x	x		MENR		→		
16.	Design consumer / connection – management guidelines	x	x	x	x	x	x	x	x	x	x		Consultant		→		
17.	Design meter reading / servicing / disconnection schedules and guidelines.	x	x	x	x	x	x	x	x	x	x		Consultant		→		
18.	Amend the Water Act to impose stiff penalties, debt recovery including additional costs incurred												MENR	x			→
19.	Introduce penalties for illegal consumers through the water under taker												MENR				→
20.	Treat GOK bodies like any other consumer.	x	x	x	x	x	x	x	x	x	x		MENR		→		
21.	Undertake analysis to substantiate and confirm old debts	x	x	x	x	x	x	x	x	x	x		Consultant		→		
22.	Propose write off procedure for old debtors	x	x	x	x	x	x	x	x	x	x		Consultant and MENR				→
23.	Recommend commercial charges and penalties	x	x	x	x	x	x	x	x	x	x		Consultant and MENR		→		
24.	Create staff, consumer and stake holder awareness on cost of production and distribution of water	x	x	x	x	x	x	x	x	x	x		Consultant		→		

ACTION PLAN

SUMMARY TABLE: ST 8.4

No.	Action	Narok	Meru	Muranga	Kabarnet	Makindu	Wundanyi	Migori	Lamu	Webuye	Mumias	Utility Management Plan	Action to be taken by	Donor involvement recommended	Phase I	Phase II	Phase III
13.	Prepare implementation guidelines related to gazette notices and relating procedures	x	x	x	x	x	x	x	x	x	x	x	Consultant & MENR		→		
14.	Prepare consumer and connection management guidelines	x	x	x	x	x	x	x	x	x	x	x	Consultant		→		
15.	Investigate replacement of Minimum charge consumer meters with Flow Restriction Meters (Devices to avoid waste)	x	x	x	x	x	x	x	x	x	x	x	MENR		→		
16.	Design consumer / connection – management guidelines	x	x	x	x	x	x	x	x	x	x	x	Consultant		→		
17.	Design meter reading / servicing / disconnection schedules and guidelines.	x	x	x	x	x	x	x	x	x	x	x	Consultant		→		
18.	Amend the Water Act to impose stiff penalties, debt recovery including additional costs incurred												MENR	x			→
19.	Introduce penalties for illegal consumers through the water under taker												MENR				→
20.	Treat GOK bodies like any other consumer.	x	x	x	x	x	x	x	x	x	x	x	MENR		→		
21.	Undertake analysis to substantiate and confirm old debts	x	x	x	x	x	x	x	x	x	x	x	Consultant		→		
22.	Propose write off procedure for old debtors	x	x	x	x	x	x	x	x	x	x	x	Consultant and MENR				→
23.	Recommend commercial charges and penalties	x	x	x	x	x	x	x	x	x	x	x	Consultant and MENR		→		
24.	Create staff, consumer and stake holder awareness on cost of production and distribution of water	x	x	x	x	x	x	x	x	x	x	x	Consultant		→		

ACTION PLAN

SUMMARY TABLE: ST 8.4

No.	Action	Narok	Meru	Muranga	Kabarnet	Makindu	Wundanyi	Migori	Lamu	Webuye	Mumias	Utility Management Plan	Action to be taken by	Donor involvement recommended	Phase I	Phase II	Phase III
25.	Outsource the servicing for master meters and condition future supply / tenders to procurement with service backup	x	x	x	x	x	x	x	x	x	x		Consultant and MENR		→		
26.	Decentralise AIE funding and procurement procedures to system level and transfer efficient and stringent control to the provincial / regional office level	x	x	x	x	x	x	x	x	x	x		Consultant and MENR			→	
27.	Decentralise decision making process to station level	x	x	x	x	x	x	x	x	x	x		Consultant and MENR			→	
28.	Decentralise planning and control of cost	x	x	x	x	x	x	x	x	x	x		Consultant and MENR			→	
29.	Design efficient and stringent control system for the provincial / regional office level (Price analyst, independent external auditors, adequate use of chemicals)	x	x	x	x	x	x	x	x	x	x		Consultant and MENR		→	→	
30.	Negotiate reduced power tariff used for production of water												MENR	x	→		
31.	Investigate into the possibilities of water used to create power before it is treated and distributed.												MENR	x	→		
32.	Design MIS reporting system for Provincial to HQ reporting (investment planning, policy making)	x	x	x	x	x	x	x	x	x	x		Consultant		→	→	
33.	Set up stock management system and controls	x	x	x	x	x	x	x	x	x	x		Consultant		→		
34.	Set up consumer meter workshop (with volumetric test facilities)	x	x	x	x	x	x	x	x	x	x		Consultant		→		

ACTION PLAN

SUMMARY TABLE: ST 8.4

No.	Action	Narok	Meru	Muranga	Kabarnet	Makindu	Wundanyi	Migori	Lamu	Webuye	Mumias	Utility Management Plan	Action to be taken by	Donor involvement recommended	Phase I	Phase II	Phase III
25.	Outsource the servicing for master meters and condition future supply / tenders to procurement with service backup	x	x	x	x	x	x	x	x	x	x	x	Consultant and MENR		→		
26.	Decentralise AIE funding and procurement procedures to system level and transfer efficient and stringent control to the provincial / regional office level	x	x	x	x	x	x	x	x	x	x	x	Consultant and MENR			→	
27.	Decentralise decision making process to station level	x	x	x	x	x	x	x	x	x	x	x	Consultant and MENR			→	
28.	Decentralise planning and control of cost	x	x	x	x	x	x	x	x	x	x	x	Consultant and MENR			→	
29.	Design efficient and stringent control system for the provincial / regional office level (Price analyst, independent external auditors, adequate use of chemicals)	x	x	x	x	x	x	x	x	x	x	x	Consultant and MENR			→	
30.	Negotiate reduced power tariff used for production of water												MENR	x	→		
31.	Investigate into the possibilities of water used to create power before it is treated and distributed.												MENR	x	→		
32.	Design MIS reporting system for Provincial to HQ reporting (investment planning, policy making)	x	x	x	x	x	x	x	x	x	x	x	Consultant			→	
33.	Set up stock management system and controls	x	x	x	x	x	x	x	x	x	x	x	Consultant		→		
34.	Set up consumer meter workshop (with volumetric test facilities)	x	x	x	x	x	x	x	x	x	x	x	Consultant		→		

ACTION PLAN

SUMMARY TABLE: ST 8.4

No.	Action	Narok	Meru	Muranga	Kabarnet	Makindu	Wundanyi	Migori	Lamu	Webuye	Mumias	Utility Management Plan	Action to be taken by	Donor involvement recommended	Phase I	Phase II	Phase III
35.	Prepare / update O&M guidelines / manuals	x	x	x	x	x	x	x	x	x	x	x	Consultant		→		
36.	Propose outsourcing criterias for pump maintenance depending on the pump capacity.											x	Consultant		→		
37.	Include consumer lines into the planned network	x	x	x	x	x	x	x	x	x	x	x	Consultant and MENR	x	→		
38.	Clarify and document water wayleafs	x	x	x	x	x	x	x	x	x	x	x	Consultant and MENR				→
39.	Introduce retainer security on contracted civil works and quality control	x	x	x	x	x	x	x	x	x	x	x	Consultant and MENR	x			→

ACTION PLAN

SUMMARY TABLE: ST 8.4

No.	Action	Narok	Meru	Muranga	Kabarnet	Makindu	Wundanyi	Migori	Lamu	Webuye	Mumias	Utility Management Plan	Action to be taken by	Donor involvement recommended	Phase I	Phase II	Phase III
35.	Prepare / update O&M guidelines / manuals	x	x	x	x	x	x	x	x	x	x	x	Consultant		→		
36.	Propose outsourcing criterias for pump maintenance depending on the pump capacity.											x	Consultant		→		
37.	Include consumer lines into the planned network	x	x	x	x	x	x	x	x	x	x	x	Consultant and MENR	x	→		
38.	Clarify and document water wayleafs	x	x	x	x	x	x	x	x	x	x	x	Consultant and MENR				→
39.	Introduce retainer security on contracted civil works and quality control	x	x	x	x	x	x	x	x	x	x	x	Consultant and MENR	x			→

APPENDIX B4
MERU
TOWN

Table B4-1: Water Demand Projection Meru Town Water Supply

TableC4-1 Demand

Year	Population	Income brackets		Population	Demand rate lcd	Demand m ³ /day	Institutional demand m ³ /d	Total demand m ³ /day	Production capacity m ³ /day	Transmission capacity m ³ /d	Storage capacity m ³
		Status	%								
1999	126,400	High	16	20,224	250	5,056	1,000	20,276	6,000	5,000	1,100
		Middle	66	83,424	150	12,514					
		Low	18	22,752	75	1,706					
2000	130,100	High	16	20,816	250	5,204	1,000	20,840	6,000	5,000	1,100
		Middle	66	85,866	150	12,880					
		Low	18	23,418	75	1,756					
2001	133,900	High	16	21,424	250	5,356	1,000	21,420	6,000	5,000	1,100
		Middle	66	88,374	150	13,256					
		Low	18	24,102	75	1,808					
2002	137,700	High	16	22,032	250	5,508	1,000	21,999	6,000	5,000	1,100
		Middle	66	90,882	150	13,632					
		Low	18	24,786	75	1,859					
2003	141,700	High	16	22,672	250	5,668	1,000	22,609	6,000	5,000	1,100
		Middle	66	93,522	150	14,028					
		Low	18	25,506	75	1,913					
2004	145,900	High	16	23,344	250	5,836	1,000	23,250	6,000	5,000	1,100
		Middle	66	96,294	150	14,444					
		Low	18	26,262	75	1,970					
2005	150,100	High	16	24,016	250	6,004	1,000	23,890	6,000	5,000	1,100
		Middle	66	99,066	150	14,860					
		Low	18	27,018	75	2,026					
2006	154,400	High	16	24,704	250	6,176	1,000	24,546	6,000	5,000	1,100
		Middle	66	101,904	150	15,286					
		Low	18	27,792	75	2,084					
2007	158,900	High	16	25,424	250	6,356	1,000	25,232	6,000	5,000	1,100
		Middle	66	104,874	150	15,731					
		Low	18	28,602	75	2,145					
2008	163,500	High	16	26,160	250	6,540	1,000	25,934	6,000	5,000	1,100
		Middle	66	107,910	150	16,187					
		Low	18	29,430	75	2,207					
2009	168,300	High	16	26,928	250	6,732	1,000	26,666	6,000	5,000	1,100
		Middle	66	111,078	150	16,662					
		Low	18	30,294	75	2,272					
2010	173,100	High	16	27,696	250	6,924	1,000	27,398	6,000	5,000	1,100
		Middle	66	114,246	150	17,137					
		Low	18	31,158	75	2,337					

Table B4-2: BUSINESS PLANS Meru Town Water Supply

CASH FLOWS

Year	1	2	3	4	5	6	7	8	9	10
REVENUE GENERATED										
Revenue from Extra Water Sold	8,900,160	13,350,240	14,833,600	14,833,600	14,833,600	14,833,600	14,833,600	14,833,600	14,833,600	14,833,600
Revenue from Unaccounted for Water	16,671,854	16,671,854	18,711,474	18,711,474	18,711,474	18,711,474	18,711,474	20,751,094	20,751,094	20,751,094
Savings from Collection Efficiency	-	6,809,930	7,908,749	7,908,749	7,908,749	7,908,749	7,908,749	7,908,749	7,908,749	7,908,749
Revenue from Sewerage Charges	8,158,480	8,158,480	8,158,480	8,158,480	8,158,480	8,158,480	8,158,480	8,158,480	8,158,480	8,158,480
Total	33,730,494	44,990,504	49,612,303	49,612,303	49,612,303	49,612,303	49,612,303	51,651,923	51,651,923	51,651,923
Expenditures (Kenya Shilling)										
Transport & Staff Related Expenses	6,071,489	8,098,291	8,930,214	8,930,214	8,930,214	8,930,214	8,930,214	9,297,346	9,297,346	9,297,346
O&M	6,746,099	8,998,101	9,922,461	9,922,461	9,922,461	9,922,461	9,922,461	10,330,385	10,330,385	10,330,385
Postage	128,176	170,964	188,527	188,527	188,527	188,527	188,527	196,277	196,277	196,277
Telephone	306,947	409,414	451,472	451,472	451,472	451,472	451,472	470,032	470,032	470,032
Purchase of meters	553,180	737,844	813,642	813,642	813,642	813,642	813,642	847,092	847,092	847,092
Stationery	367,662	490,396	540,774	540,774	540,774	540,774	540,774	563,006	563,006	563,006
Fuel & Gas	1,703,390	2,272,020	2,505,421	2,505,421	2,505,421	2,505,421	2,505,421	2,608,422	2,608,422	2,608,422
Current O&M Costs	(3,853,067)	(3,853,067)	(3,853,067)	(3,853,067)	(3,853,067)	(3,853,067)	(3,853,067)	(3,853,067)	(3,853,067)	(3,853,067)
Incremental O&M Costs	12,023,876	17,323,963	19,499,444	19,499,444	19,499,444	19,499,444	19,499,444	20,459,493	20,459,493	20,459,493
Sulplus(Deficit)	21,706,617	27,666,541	30,112,859	30,112,859	30,112,859	30,112,859	30,112,859	31,192,430	31,192,430	31,192,430
Average Tariff (Kshs/m3)	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4
Investment Costs										
Net Cash Flow	21,706,617	27,666,541	30,112,859	30,112,859	30,112,859	30,112,859	30,112,859	31,192,430	31,192,430	31,192,430
Cumulative Cash Flow	21,706,617	49,373,158	79,486,017	109,598,876	139,711,735	169,824,594	199,937,452	231,129,882	262,322,312	293,514,742

Table C4-3 Financial Cashflow

Table B4-3: Financial Cash Flow

Meru Town Water Supply

Year	Investment Cost	O&M Cost	Total Cost	Water Revenue	Net Revenue
1	113,757,360	12,023,876	125,781,236	33,730,494	(92,050,742.59)
2	163,335,600	17,323,963	180,659,563	44,990,504	(135,669,059)
3	74,046,240	19,499,444	93,545,684	49,612,303	(43,933,381)
4	1,932,000	19,499,444	21,431,444	49,612,303	28,180,859
5		19,499,444	19,499,444	49,612,303	30,112,859
6	-	19,499,444	19,499,444	49,612,303	30,112,859
7	-	19,499,444	19,499,444	49,612,303	30,112,859
8	-	20,459,493	20,459,493	51,651,923	31,192,430
9	-	20,459,493	20,459,493	51,651,923	31,192,430
10	-	20,459,493	20,459,493	51,651,923	31,192,430
Total	353,071,200	188,223,538	541,294,738	481,738,280	(59,556,458)

Average Tariff Rate (Ksh/m3) 25.4

FIRR		-5%
NPV		(91,699,120)
RER		0.890

Table B4-4: Economic Cash Flow

Meru Town Water Supply

Year	Economic Investment Cost	O&M Cost	Total Cost	Economic Benefit	Net Revenue
1	118,557,360	12,023,876	130,581,236	55,387,499	(75,193,737)
2	163,335,600	17,323,963	180,659,563	58,518,948	(122,140,615)
3	74,046,240	19,499,444	93,545,684	61,815,210	(31,730,474)
4	1,932,000	19,499,444	21,431,444	65,276,285	43,844,841
5		19,499,444	19,499,444	68,737,360	49,237,916
6		19,499,444	19,499,444	72,280,841	52,781,397
7		19,499,444	19,499,444	75,989,136	56,489,692
8		20,459,493	20,459,493	79,779,837	59,320,344
9		20,459,493	20,459,493	83,735,351	63,275,858
10		20,459,493	20,459,493	87,690,865	67,231,372
Total	357,871,200	188,223,538	546,094,738	709,211,332	163,116,593

Current Tariff Rate (Ksh/m3)	25.4
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EIRR		11%
NPV		82,375,027
CBR		0.770

Table C4-5 Economic Benefits

Meru Town Water Supply**Table B4-5: Estimated Benefit of time saved through water carrying.**

Year	Population served	Number of Household	Current Households Served	Projected Households Served	Additional Households Served	Water Carriage Benefit	Health Benefit	Health Costs Saved	Total
									Benefits
2001	133,900	24,345	2425	4869	2444	41,928,380	10,998,409	2,460,711	55,387,499
2002	137,700	25,036	2425	5007	2582	44,298,889	11,620,227	2,599,832	58,518,948
2003	141,700	25,764	2425	5153	2728	46,794,161	12,274,773	2,746,276	61,815,210
2004	145,900	26,527	2425	5305	2880	49,414,198	12,962,045	2,900,042	65,276,285
2005	150,100	27,291	2425	5458	3033	52,034,234	13,649,318	3,053,807	68,737,360
2006	154,400	28,073	2425	5615	3190	54,716,652	14,352,955	3,211,234	72,280,841
2007	158,900	28,891	2425	5778	3353	57,523,834	15,089,318	3,375,983	75,989,136
2008	163,500	29,727	2425	5945	3520	60,393,398	15,842,045	3,544,394	79,779,837
2009	168,300	30,600	2425	6120	3695	63,387,725	16,627,500	3,720,126	83,735,351
2010	173,100	31,473	2425	6295	3870	66,382,052	17,412,955	3,895,858	87,690,865
Total	1,527,500					536,873,523	140,829,545	31,508,264	709,211,332

Current Tariff Rate	Kshs.	25.4				25.4
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Note:

The benefits increase with increase in population

Table C4-6 Est Water Revenue

Table B4-6: ESTIMATED WATER REVENUE

Meru Town Water Supply

YEAR	0	1	2	3	4	5	6	7	8	9	10	11
Design production capacity (m ³ /day)	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
ditto (million m ³ /year)	2.190	2.190	2.190	2.190	2.190	2.190	2.190	2.190	2.190	2.190	2.190	2.190
Current daily production (m3/day)	4,400	4,400	4,400	4,400	4,400	4,400	4,400	4,400	4,400	4,400	4,400	4,400
Current daily water sales (m3/day)		1,502	1,502	1,502	1,502	1,502	1,502	1,502	1,502	1,502	1,502	1,502
Projected population	126,427	130,100	133,900	137,700	141,700	145,900	150,100	154,400	158,900	163,500	168,300	173,100
Projected daily demand (m ³ /day)	20,276	20,840	21,420	21,999	22,609	23,250	23,890	24,546	25,232	25,934	26,666	27,398

Average Tariff		Kshs	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4
Revenue from Extra Water Sold		Kshs	8,900,160	13,350,240	14,833,600	14,833,600	14,833,600	14,833,600	14,833,600	14,833,600	14,833,600	14,833,600
Revenue from Unaccounted for Water		Kshs	16,671,854	16,671,854	18,711,474	18,711,474	18,711,474	18,711,474	18,711,474	20,751,094	20,751,094	20,751,094
Savings from Collection Efficiency		Kshs	-	6,809,930	7,908,749	7,908,749	7,908,749	7,908,749	7,908,749	7,908,749	7,908,749	7,908,749
Revenue from Sewerage Charges		Kshs	8,158,480	8,158,480	8,158,480	8,158,480	8,158,480	8,158,480	8,158,480	8,158,480	8,158,480	8,158,480
Total Financial Benefits		Kshs	33,730,494	44,990,504	49,612,303	49,612,303	49,612,303	49,612,303	49,612,303	51,651,923	51,651,923	51,651,923

Table B4-7: Mean Household Size and Income by Region and Poverty

District	Town	Mean Household Size			Total Household Income (Kshs)
		Non-Poor	Poor	Mean	
Narok	Narok	5.3	6.6	5.6	18,164.20
Meru	Meru	5.6	7.1	6	9,320.70
Murang'a	Murang'a	5.3	7.2	5.9	11,512.90
Baringo	Kabarnet	4.5	6.5	5.1	9,532.90
Makueni	Makindu	4.7	7	6.2	5,520.10
Taita-Taveta	Wundanyi	3.5	5.3	4.2	3,526.10
Migori	Migori	4.9	6.4	5.3	6,641.20
Lamu	Lamu	4.3	6.3	4.7	10,321.30
Bungoma	Webuye	6.2	7.1	6.6	7,981.70
Butere-Mumi	Mumias	4.8	6.3	5.5	7,270.20

Source: Welfare Monitoring Survey II, 1994

Table B4-8: Institutional Development Costs Meru 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	Standard infrastructural valuation procedures	5,000,000
	(b) Identify and value other assets.		
5	Develop staffing and financial plans for the new organisation	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 organisation	Average annual billings for the last 3 years	3,000,000
Sub -total			50,400,000
Contingency (10%)			5,040,000
Total			55,440,000

Table C4-9 Financial Costs

Table B4-9: Financing Plan Meru Town Water Supply

	1	2	3	4	Total
	Kshs	Kshs	Kshs	Kshs	Kshs
Institutional Development Costs	26,400,000	14,520,000	14,520,000		55,440,000
Consultancy Fees for Works (20% of works)	14,559,560	24,802,600	9,921,040	322,000	49,605,200
Water Supply Rehabilitation	71,992,800	119,988,000	47,995,200		239,976,000
Sanitation Rehabilitation	805,000	4,025,000	1,610,000	1,610,000	8,050,000
Total Overall Project Cost	113,757,360	163,335,600	74,046,240	1,932,000	353,071,200

Table C4-10 Economic Costs

Table B4-10: Economic Investment Costs Meru Town Water Supply

	1	2	3	4	Total
	Kshs	Kshs	Kshs	Kshs	Kshs
Institutional Development Costs	26,400,000	14,520,000	14,520,000	-	55,440,000
Household costs	4,800,000				4,800,000
Consultancy Fees for Works (20% of works)	14,559,560	24,802,600	9,921,040	322,000	49,605,200
Water Supply Rehabilitation	71,992,800	119,988,000	47,995,200	-	239,976,000
Sanitation Rehabilitation	805,000	4,025,000	1,610,000	1,610,000	8,050,000
Total Overall Project Cost	118,557,360	163,335,600	74,046,240	1,932,000	357,871,200

Table B4-11: Financial Sensitivity Analysis - Increase Project Life to 15 years

Financial Cash Flow Meru Town Water Supply

Year	Investment Cost	O&M Cost	Total Cost	Water Revenue	Net Revenue
1	113,757,360	12,023,876	125,781,236	33,730,494	(92,050,743)
2	163,335,600	17,323,963	180,659,563	44,990,504	(135,669,059)
3	74,046,240	19,499,444	93,545,684	49,612,303	(43,933,381)
4	1,932,000	19,499,444	21,431,444	49,612,303	28,180,859
5		19,499,444	19,499,444	49,612,303	30,112,859
6	-	19,499,444	19,499,444	49,612,303	30,112,859
7	-	19,499,444	19,499,444	49,612,303	30,112,859
8	-	20,459,493	20,459,493	51,651,923	31,192,430
9	-	20,459,493	20,459,493	51,651,923	31,192,430
10	-	20,459,493	20,459,493	51,651,923	31,192,430
11	-	20,459,493	20,459,493	51,651,923	31,192,430
12	-	20,459,493	20,459,493	51,651,923	31,192,430
13	-	20,459,493	20,459,493	51,651,923	31,192,430
14	-	20,459,493	20,459,493	51,651,923	31,192,430
15	-	20,459,493	20,459,493	51,651,923	31,192,430
Total	353,071,200	290,521,004	643,592,204	739,997,894	96,405,690

Average Tariff Rate (Ksh/m3)	25.4
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FIRR	4%
NPV	2,111,852
RER	1.150

Table B4-12: Financial Sensitivity Analysis - Increase Project Life to 15 years + Investment Cost & O&M by 15%

Financial Cash Flow Meru Town Water Supply

Year	Investment Cost	O&M Cost	Total Cost	Water Revenue	Net Revenue
1	130,820,964	13,827,458	144,648,422	33,730,494	(110,917,928)
2	187,835,940	19,922,558	207,758,498	44,990,504	(162,767,994)
3	85,153,176	22,424,361	107,577,537	49,612,303	(57,965,234)
4	2,221,800	22,424,361	24,646,161	49,612,303	24,966,142
5		22,424,361	22,424,361	49,612,303	27,187,942
6	-	22,424,361	22,424,361	49,612,303	27,187,942
7	-	22,424,361	22,424,361	49,612,303	27,187,942
8	-	23,528,417	23,528,417	51,651,923	28,123,506
9	-	23,528,417	23,528,417	51,651,923	28,123,506
10	-	23,528,417	23,528,417	51,651,923	28,123,506
11	-	23,528,417	23,528,417	51,651,923	28,123,506
12	-	23,528,417	23,528,417	51,651,923	28,123,506
13	-	23,528,417	23,528,417	51,651,923	28,123,506
14	-	23,528,417	23,528,417	51,651,923	28,123,506
15	-	23,528,417	23,528,417	51,651,923	28,123,506
Total	406,031,880	334,099,154	740,131,034	739,997,894	(133,140)

Average Tariff Rate (Ksh/m3) 25.4

FIRR		0%
NPV		(78,946,385)
RER		1.000

Table B4-13: Financial Sensitivity Analysis - Finance by Grant

Financial Cash Flow Meru Town Water Supply

Year	Investment Cost	O&M Cost	Total Cost	Water Revenue	Net Revenue
1	113,757,360	12,023,876	125,781,236	33,730,494	(92,050,743)
2	163,335,600	17,323,963	180,659,563	44,990,504	(135,669,059)
3	74,046,240	19,499,444	93,545,684	49,612,303	(43,933,381)
4	1,932,000	19,499,444	21,431,444	49,612,303	28,180,859
5		19,499,444	19,499,444	49,612,303	30,112,859
6	-	19,499,444	19,499,444	49,612,303	30,112,859
7	-	19,499,444	19,499,444	49,612,303	30,112,859
8	-	20,459,493	20,459,493	51,651,923	31,192,430
9	-	20,459,493	20,459,493	51,651,923	31,192,430
10	-	20,459,493	20,459,493	51,651,923	31,192,430
11	-	20,459,493	20,459,493	51,651,923	31,192,430
12	-	20,459,493	20,459,493	51,651,923	31,192,430
13	-	20,459,493	20,459,493	51,651,923	31,192,430
14	-	20,459,493	20,459,493	51,651,923	31,192,430
15	-	20,459,493	20,459,493	51,651,923	31,192,430
Total	353,071,200	290,521,004	643,592,204	739,997,894	96,405,690

Average Tariff Rate (Ksh/m3) 25.4

FIRR		4%
NPV		96,405,690
RER		1.150

TableC4-14 E-Sensitivity Case1

Table B4-14: Economic Sensitivity Analysis - Increase Economic Investment Costs by 15%

Economic Cash Flow

Meru Town Water Supply

Year	Economic Investment Cost	O&M Cost	Total Cost	Economic Benefit	Net Revenue
1	136,340,964	12,023,876	148,364,840	55,387,499	(92,977,341)
2	187,835,940	17,323,963	205,159,903	58,518,948	(146,640,955)
3	85,153,176	19,499,444	104,652,620	61,815,210	(42,837,410)
4	2,221,800	19,499,444	21,721,244	65,276,285	43,555,041
5		19,499,444	19,499,444	68,737,360	49,237,916
6		19,499,444	19,499,444	72,280,841	52,781,397
7		19,499,444	19,499,444	75,989,136	56,489,692
8		20,459,493	20,459,493	79,779,837	59,320,344
9		20,459,493	20,459,493	83,735,351	63,275,858
10		20,459,493	20,459,493	87,690,865	67,231,372
Total	411,551,880	188,223,538	599,775,418	709,211,332	109,435,913

Current Tariff Rate (Ksh/m3) 25.4

EIRR		6%
NPV		32,501,719
CBR		0.846

Table B4-15: Economic Sensitivity Analysis - Increase O&M Costs by 15%

Economic Cash Flow Meru Town Water Supply

Year	Economic Investment Cost	O&M Cost	Total Cost	Economic Benefit	Net Revenue
1	118,557,360	13,827,458	132,384,818	55,387,499	(76,997,319)
2	163,335,600	19,922,558	183,258,158	58,518,948	(124,739,210)
3	74,046,240	22,424,361	96,470,601	61,815,210	(34,655,391)
4	1,932,000	22,424,361	24,356,361	65,276,285	40,919,924
5		22,424,361	22,424,361	68,737,360	46,312,999
6		22,424,361	22,424,361	72,280,841	49,856,481
7		22,424,361	22,424,361	75,989,136	53,564,775
8		23,528,417	23,528,417	79,779,837	56,251,420
9		23,528,417	23,528,417	83,735,351	60,206,934
10		23,528,417	23,528,417	87,690,865	64,162,448
Total	357,871,200	216,457,069	574,328,269	709,211,332	134,883,063

Current Tariff Rate (Ksh/m³)	25.4
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EIRR		9%
NPV		59,727,555
CBR		0.810

Table B4-16: Economic Sensitivity Analysis - Increase Economic Investment Costs and O& M by 15%

Economic Cash Flow Meru Town Water Supply

Year	Economic Investment Cost	O&M Cost	Total Cost	Economic Benefit	Net Revenue
2001	136,340,964	13,827,458	150,168,422	55,387,499	(94,780,923)
2002	187,835,940	19,922,558	207,758,498	58,518,948	(149,239,550)
2003	85,153,176	22,424,361	107,577,537	61,815,210	(45,762,327)
2004	2,221,800	22,424,361	24,646,161	65,276,285	40,630,124
2005		22,424,361	22,424,361	68,737,360	46,312,999
2006		22,424,361	22,424,361	72,280,841	49,856,481
2007		22,424,361	22,424,361	75,989,136	53,564,775
2008		23,528,417	23,528,417	79,779,837	56,251,420
2009		23,528,417	23,528,417	83,735,351	60,206,934
2010		23,528,417	23,528,417	87,690,865	64,162,448
Total	411,551,880	216,457,069	628,008,949	709,211,332	81,202,383

Current Tariff Rate (Ksh/m3)	25.4
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EIRR		5%
NPV		9,854,246
CBR		0.886

Table C4-17-rehab-costs-water

Table B4.17 : Cost estimates of rehabilitation works			Meru Town Water Supply		
Ref	Description	Unit	Quantity	Rate (Kshs)	Amount (Kshs)
1 Water meters					
1.1	Bulk meters (various diameters)	no.	12	250,000	3,000,000
1.2	Domestic meters	no.	3,000	6,000	18,000,000
2 Storage					
2.2	1,000 m ³ ground level tank	no.	4	5,000,000	20,000,000
3 Pipes					
3.1	DN100 uPVC pumping main	m	1,200	2,000	2,400,000
3.1	Distribution uPVC DN 50 - 100	Km	50	2,500	125,000,000
4 Logistical facilities and equipment					
4.1	Rehabilitate existing office buildings	Sum		2,000,000	2,000,000
4.2	4WD twin-cab pick-ups	no.	2	2,500,000	5,000,000
4.3	Saloon car	no.	1	1,500,000	1,500,000
4.4	Motorcycles	no.	6	250,000	1,500,000
4.5	Computers	no.	8	200,000	1,600,000
4.6	Printers	no.	3	100,000	300,000
4.7	Computer software	Sum		500,000	500,000
4.8	Office equipment & furniture	Sum		1,000,000	1,000,000
		Total of works			181,800,000
Add 20% preliminaries and general items					
		Sub-total			36,360,000
	10% contingencies				218,160,000
	20% consultancy fee				21,816,000
		Sub-total			239,976,000
					47,995,200
		GRAND TOTAL			287,971,200
				Say	288 million

Table B4.18 : Cost estimates of rehabilitation works for Meru Sewage System

Item No.	Item description	Cost of item	Priority ranking
		Kshs	
1	Desludging of the existing ponds	2,400,000	1
2	New inlet works	1,500,000	1
3	Rehabilitate effluent percolation system.	1,600,000	1
4	Replace manhole covers	800,000	1
5	Unblock and clean sewer lines	1,500,000	1
6	Maintenance equipment	250,000	1
	Total	8,050,000	
	Consultancy (20%)	1,610,000	
	Total	9,660,000	

