Development Impact Consulting

Engineering and Utility Management Ltd.

GIBB Eastern Africa
LAWGIBB Group Member

Gibb Eastern Africa Ltd.

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

CONSORTIUM

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

Location: Narok WS&S System
Date: 20-22.09.2000

Interviewer: LEK and CK

****

Discussion/Interview with: District Water Officer: Eng. S.M.Otieno
Head of Revenue: Mr. Ongueni
Div.Water Ext.Officer: Mr. Soitera

Telephone: 0305-(2)2212
P.O.Box 6
Narok

	Question:	*Answer:*
A.	Utility System	
1.	Office Set-up	
	Office space?	*5 offices, plus secretary, plus tel.operator & intake office cum lab(empty), Store at office and intake*
	Office equipment?	*1 electr. Typewriter*
	Tel.lines?	*yes, 2 lines, of which one is DL of DWO, switchboard*
	Fax?	*No*
	E-mail?	*No*
	Reliable Power supply?	*Yes, Because on the Hospital line*
	Rationing?	*No*
	Other comments?	*As soon as the next AIE is out intention to buy computer and printer*
	Hardware, Software and skill: separate questionnaire !!	*No hardware, no software aviailable* *Encouraging staff to go for computer training through their own means*
2.	Staffing Set-up	
	Total number of staff?	*34*
	Male/Femal ratio?	*29/5*
	Fluctuation? Due to?	*No, 90% of the staff have been at the station for more than 10 years*
	Average years within the system?	*Many*
	Orga chart in place?	*Only for the District, not for the WS*
	Job description available?	*Yes, they say, BUT unable to obtain!*
	Level of skill?	*Staff is skilled, but ALL do have a technical background, none with real accounts, administration or managerial training*
	Overdue staff promotion?	*Yes, but refer to promotion procedures*
	Training facilities offered?	*Yes, but interest does not necessarily end in reply or staff go on study leave on their own a/c*
	Used facilities?	*KEWI*
	Technical? or Administration? or Management?	*All technical*
	Qualification Station Manager	*Master in Hydrology*
	Recruitment statistics	*Not available, but recruitment requests from DWO to PWO to Director Water*
	Remuneration and benefits	*To be obtained from HQ*
3.	Transport and Logistics	
	Cars? Which? Number:	*1 Landrover 20 years old used by the district*
	Motorbike? Which? Number:	*1 Motorbike Yamaha 125cc*
	Bicycle? Number:	*No*
4.	Institutional Frame	
	MENR: Line of command?	*Everything has to be channelled through DWO,PWO to*

		MENR.
B.	**Utility Indices**	
1.	**Billing**	
	Consumption Actual vs Estimate	*Refer to Table 8.2.1* *Average for January to June 2000 is:* *8.362 cbm per month for Actual* *6.007 cbm per month for Estimate* *600 cbm per month for Kiosks*
	Consumption Billed per month	*Refer to Table 8.2.1, (which however does not correspond with what is reflected in Table 8.3.1.) Both Tables are abstracted from Narok returns to the HQ*
	Consumption Billed for the last 3 years?	*Not readily available*
	Billing Efficiency: **Water billed/Water supplied**	*Abstracted from Table 8.2.1 and calculated for period 1 – 6/00 as (1 ./. UfW %) = 57.33 % in average over the period stated*
	Billing Effectiveness: How many out of 100 bills are wrong or returned for reason	*High, consumers only come with complaints about the bill, if there was no water and they were still billed on average consumption*
2.	**Revenue & Collection**	
	Revenue Billed vs Revenue Collected per month	*Refer to Table 8.3.1 or Table 8.2.1*
	Collection Efficiency:	
	For the last 3 years monthly and annual figures	*Not readily available*
3.	**UfW**	
	1 - Recorded consumption/Production (supply efficiency) per month **Or production vs billed consumption**	*Reflected in Table 8.2.1, Average 42.67 % for the period 1 – 6/00*
	For the last 3 years, monthly and annually?	*Not readily available*
	Value of UfW: **loss x average tariff rate of system per month**	*Average Tariff not used for any return, therefore not available.* *Not calculated, as details provided not correct*
4.	**Tariff**	
	What is the average tariff rate per	*??, not known and not really something that is used*

	cbm? (Total billed water/Total water supplied = Average) Tariff structure? Current Last 3 years: Additional charges? Additional sources of income?	*anywhere* *Refer to gazetted tariff urban* *Dto* *Balance to the increased deposit will be billed in the near future!! Planned* *None*
5.	Funding Required Funding per month? Salary Procurements Power Chemicals Others	A.I.E.: 64% *Not really known* *Refer to HQ* *Total FY:99/00 Kshs 1,286,980.00 through A.I.E.* *Through HQ* *HQ (but 10 years ago cash & carry)* *No*
6.	Cost Total per month Salary Power O&M Administration Others	 *Not readily available* *??* *Approx.. Kshs 420,000.00* *Kshs 1,285,917.70 procurements etc for FY, average/month is Kshs 107,159.80* *In O&M figure* *In O&M figure*
8.	Debt Arrears Debt Arrears Situation in Kshs Increase per month? Total FY 99/00 98/99 97/98 Billed Revenue/ Debtors Totals Collected Revenue/ Debtors Totals	 *As at end of FY Kshs 4,103,052.00,* *??* *??* *Kshs 4,103,052.00* *Not readily available* *Can be calculated, but not readily available* *Can be calculated using Table 8.3.1, but not correct, because Debtor Totals would have to be based on the carried forward balances, which are based on billed revenue averages*
C.	Utility Procedures	
1.	Staff Recruitment/Promotion	*Recruitment not done, in most cases people are simply withdrawn or sent with no local consultation* *Promotion is a process you can wait for years, because the processing process in the HO seems to be very slow and involve as well nepotism* *Level of frustration high, as promotion is meant to result as well in salary adjustment which can take years to materialise.* *Even if further studies completed, staff goes back to the same category and salary as before.* *For the lower cadre promotion is based on certificate and qualification and should then come automatically. But HO seems to have no control over due staff promotion. Therefore staff assume that their annual requests are simply filed.* *For the higher cadre application must come through PSC, which is normally advertised.*

2.	**Defaulters Handling**	*If no payment, disconnection, based on the recommendation of the revenue office, however no system control and follow-up . Defaulters are however warned on their bill, prior to being disconnected.* *Disconnection, if staff situation allows.* *Illegal Re-connection: legal action was taken in 3 cases, but died, because case was only deferred from one hearing to the next.* *Today they just disconnect them from the T, calculate the suspected consumption and threaten with arrest.* *No other procedure in place !*
3.	**Administration** **Are debtors maintained monthly?** **Is an aging analysis available?** **Debtors lists for different Consumer categories?** **Are GOK Debtors followed regularly?** **Are other major Debtors followed regularly?** **Accounting** **Manual or computerised?** **If manual elaborate:** **Double Book keeping done** **Ledger cards**	*No, but GOK debtor consumers are prepared sometimes. only obtained their A/C numbers* *No,* *No,* *No only lists prepared, but difficult to follow, but new DWO has made efforts to push for their payment* *No, no procedure in place* *Manual* *There is only AIE to be accounted for* *No* *All information is in the vote book and in consumer ledger books (debits and credits)*
4.	**Funding**	*Power and salaries are automatically paid through HO and bills are not even seen.* *Chemicals are ordered in quantities and have to be collected from Nairobi central store, which becomes very difficult if no means of transport on site.* *Other procurements and expenditure follow the Government procurement procedure:* *A.I.E. is 64 %:* *Based on the monthly revenue collected, the A.I.E is applied for through MENR HQ. After approval which has to be pushed by DWO with FC in the HQ. Can take months to receive the approval,depending on availibility of funds at treasury level. Approval not yet Liquidity at the District. Sometimes the delay goes further due to cash flow or imprest constraints at District Treasury. Normally however within a week received and cheque is then issued through District Treasurer. GOK procurement procedures have to be complied with prior to using the liquidity.* *Monies allocated for a particular item cannot be transferred to another item, unless authorised by the PS, even if desparately needed.* **A.I.E. unutilised or not approved prior to the end of the**

		FY, is lost revenue for the station, as it is NOT transferred into the new FY ***Float or Imprest of 20,000.00 Kshs is available and has to be accounted for before new imprest can be received***
5.	**Installment Payment**	***Yes, possible, but no procedure instructions in place***
6.	**Meter Reading & Billing**	***MR done on plain paper, no identification in the field = problem, because MR can be mistaken as a thief. All locations known by the readers, done by the same people who run the revenue office.On return information is transferred by the same people into the consumer ledger, and bills are calculated and issued, provided stationery is available.*** ***After manually producing the bill, it is two or three days later delivered to the consumer again by the same meter readers.***
7.	**Disconnection**	***Revenue Section provides those consumer lists to dis-connect. Consumers lined up for disconnection are warned on their last bill will red pen.*** ***If staff available list executed in the field: Meter is removed and taken to the office, connection is plugged and then painted, to be able to see if a consumer has tampered with the dis-connection. Disconnection date entered into consumer ledger and meter stored in the DDWO office.*** ***All meters have to be carried to the office, because there is no transport and no other technology to seal a meter without physically removing the same.***
8.	**Meter Servicing & Servicing of lines and Appurtenances**	***No system, and only dis-connected meters are serviced or washed (if possible) before being taken back to the consumer*** ***If major consumer meter has a problem, they try to attend to it or give the consumer another meter of a long dis-connected consumer*** ***However no instruction from HQ how new policy of "Consumer buys his own meter" is to be handeled, especially as far as old stalled or damaged meters are concerned*** ***No system for routine maintenance of preventive maintenance.*** ***Soilerosion attended to, otherwise a question of cash flow***
9.	**HQ Reporting**	***Only regularly about monthly revenue collection, because it is the only way to get A.I.E., O&M monitoring report and personnell information***
10.	**Procedure Manuals**	***Only for the pumps*** ***Nothing for other O&M activities***
11.	**Consumer Deposit**	***Planned to collect the balance between the old deposit in the record and the new deposit.*** ***Not clear where consumer gets the refund. DC Treasurer says that all Deposit funds that were accumulated at DC's office have been transferred to the MENR in Nairobi, based on an instruction received by the office of the PS.***

		Not possible to get total amount within the time in Narok
12.	**Financial Control**	*There is no financial control, as consumer payments go to the District Treasurer and expenditure is through A.I.E* *However nobody in the system seems to look for or want figures reconciled or summarised.* *Everything is somewhere, somehow available, but the physical exercise involved requires at the same time a lot of time*
13.	**Cash/Cheque** **Un-accounted for cash advances?**	*I.O.U. through cash collected from consumers and then I.O.U issued to the District Accountant* **Not really clear how it works,** *but it seems that there was a certain "abuse" of I.O.U. during the tenure of the last DWO*
	Revenue Collection: **Consumer payments into consumer accounts?**	*Consumer pays at the District treasurer. Staff provided by DC's office. Copy of the payment deposit slip is collected from the District Treasurer and then transferred into the consumer ledgers. Information is collected daily from the DO's office and entered. Summarised monthly collection information is used to prepare A.I.E. at the end of the month, or whenever worthwhile to submit.*
	Cash/Bank book maintained and up to date?	*Not in the Government procedures, therfore N/A*
14.	**Sale of old movable assets:**	*If the 20 yr old Landrover is to be sold, the procedure is: Request of DWO through PWO to the PS, if yes , DWO liaises with DC and District Supply officer together with the district team for evaluation, tendered through district then auctioned.* *Proceeds go to District Treasurer and can be utilised for relacement, if approved.*
15.	**Reconciliation**	
	For Cash?	*No*
	For Bank?	*No*
D.	**Discussions**	
1.	**Staff**	
	Awareness of operation and financing cost vs turnover?	*No*
	Job satisfaction and expectation?	*Lacking facilities, no transport, no fuel, no tools, no parts, no tea, no stationary, NO CALCULATOR for any of the revenue staff*
	Existing constraints?	*Yes, many*
	Physical	*Never transport*
	Financial	*Never cash when needed*
	Institutional	*Bureaucratic procedures*
	Political	*Not in Narok at the moment*
	Personnel	*Too few staff according to the DDWO*
	Efforts made to overcome the constraints?	*Sometimes even using their own money until some cash avaiable to refund, request and negotiate with the suppliers to advance material and small items*
	Consumer relationship?	*Where no water atmosphere a bit difficult, especially if consumer at the same time received a bill, otherwise no*

		problems. Consumers do not know what the problems are, but the office is trying to create awareness
	Relationship with PWE?	*Only DWO relates to PWE*
	Relationship with Ministry?	*Nothing apart from personnel issues, which would be better dealt with at station level, as it is expensive to go to Nairobi to visit HQ. But it seems to be more efficient, if dealt with in Nairobi,*
		DWO: good relationship with FC, who is very helpful when trying to push A.I.E at Treasury
	Relationship with LA?	*No complaints about salary payments, always received in time, there no delays*
		Interferance with plot, where tanksite is located, or along the raising mains (many off-takes), otherwise no relationship.
	Planning Department?	*Not involved normally*
	With other utility providers?	*Good example: Telcom approached Water, they came with their plans to discuss supply for planned activities.*
		Never involved with Power so far
	External influence affecting the performance?	*No*
	Working environment?	*In principle good*
	What is the opinion about PSP?	*Staff questioned are in support, they are prepared to work hard and understand that a commercial approach means that if you do not perform, you will be sacked.*
		Recent retrenchment exercise has anyway taken the previously existing job security.
		Salary expectation under PSP: approx. 300 %
		Only worry: Just a little bit worried that a different management might as well reflect tribal implications
2.	**Consumers**	
	Comments on:	*No consumer visits*
	Reliability	
	Quality	
	Billing	
	Price	
	Consumer requests on:	
	Coverage	
	Reaction Time	
	Proposed changes	
	Service rating	
	Cost in relation to service provided?	
	Tapped vs kiosk?	
	View and understanding of PSP?	
	What does the consumer expect?	
	What does the consumer propose?	
	What is his/her situation on rationing?	
3.	**Stakeholders**	*Not possible within the time frame*

E.	Consumers	
1.	**Consumer Portfolio**	
	Total number?	1394 ***but some never connected***
	Ratio Major/minor consumers?	??
	Consumer classification?	***Not available***
	Consumer categories?	***Number not available, follow gazetted categories***
	No. of new connect. Applied?	***Approx. 12 per month***
	No of new connect. Done?	***Approx. 5 per month, BUT to be reconfirmed by counting the application forms***
	Percentage of suspected illegal connections?	***Illegal re-connections suspected to be high as no transport means to control those that have been disconnected in the past***
	Coverage water?	***35 sqkm of the network, but water can only be distributed over approx. 15 sqkm. Tankers cover the outer areas and storage tanks sell water like kiosks in the peri urban***
	How many Kiosks are in operation?	***6 in town***
	Coverage Sanitation?	***No sanitation in place***
2.	**Consumer Indices**	***No information available***
3.	**Consumer Procedures**	
	Open account?	***Deposit amount has been changed severally over the years. New deposit applied for new applications, but no instruction from MENR HO, whether all meter connections have to be raised to the same deposit level.*** ***Consumer copies application form, survey undertaken by DWEO or Officer in Charge of O&M, Consumer fills form, DWO has to approve application. Consumer pays for connection (Labour Kshs 215,00) and deposit (between 1,000.00 and 50,000.00)and is advised to buy required fittings. "Estimate Book" before to calculate and give the norms, but now not available. Survey uses plain paper, but no quality information or control. C. provides material as requested for by survey. Consumer comes back to confirm availability of material. Any pipefitter is assigned to carry out the physical connection.*** ***2 different agreement forms available*** **Since 01/2000 consumer requested to buy his own meter**
	Close account?	***No close account form available. Consumer comes with the request and the latest bill. One officer goes to the field to read the meter, bill is issued, consumer settles the bill and any arrears and brings the initial deposit receipt.*** ***Consumer sent to DC's office for refund, but information that since the letter of the PS was sent out requesting for all deposits to be sent to HQ, DC's office sends people to Nairobi. Earlier (3-4 years ago) deposit was re-claimed from DC's office. Now consumer is referred to HQ. Transport to Nbi however higher than deposit !!***

		Deposit can not be off-set against the last bill !!
	Get a credit into the next bill?	*Book credit can be done,but to be approved by DWO. refund very difficult*
	Change address?	*N/A, as everything is hand-delivered, but every consumer has a forwarding address*
	Transfer account?	*Consumer 1 clears the 'old'account and consumer 2 takes over the same a/c number as a 'new' account. Only comment in the consumer ledger that somebody else has taken over the account. Retroactively very difficult to follow*
F.	**Technical System**	
1.	**System Components?**	*Intake* *T-Works (3)* *Tank to Teachers College (Reservoir on Council Land)* *To F.T.C. (Farmers Training Centre)* *To Office* *Steel Tank (not in use)* *Masonry Tank (NC&PB) and school (booster maintained by NCPB)*
	Is pumping necessary?	*Yes*
2.	**Zonal Meters**	
	How many are in the system?	*3, but only at the production out-let*
	Are they controlling areas?	*No*
	Are they functioning?	*Yes*
3.	**Network**	
	Transmission lines?	*Length: approx. 5 km*
	Distribution lines?	*Length: approx. 35 km*
	Consumer lines?	*Not known*
	Whole system coverage?	*Not known*
	Fully utilised?	*No, due to shortage of water*
4.	**Coverage**	*Actual: 15sqkm*
G.	**Technical Indices**	
1.	**Production**	
	Capacity per day	*2,400 cbm*
	Actual per day	*approx. 1,300 cbm*
		Average 1-6/00 production/Capacity = P.Efficiency
	Production Efficiency?	*39.627cbm / 72.000 cbm = 55%*
2.	**Pumping Efficiency**	*??* *5 high lift: 4 operational* *5 low lift: 4 operational*
3.	**Supply Efficiency**	
	1 - UfW	*Using Table 8.2.1, the UfW calculated = 42.67%, therefore difference of 57.33% considered as supply efficiency*
4.	**Service Efficiency**	
	How many days to attend to the problem?	*Depending on the availability of the part or tools required, but they try to attend to major consumers immediately*

	No. of total meters/number of operational meters?	*Operational approx. 600 meters*
	Total zonal meters/operational zonal meters?	*N/A, as none in the system*
5.	**Sanitation** **Treatment Capacity** **Actual**	*N/A*
H.	**Technical Procedures**	
1.	**O&M**	*Soilerosion is attended to, all other requirements depend on material availability, cashflow, transport etc* *No schedule or system in place*
2.	**Rationing**	*Rooster is prepared and to be approved by DWO*
3.	**Stock&Procurement** **Itemised stock list?**	*No, stock empty*
	Stock value	*N/A*
	Repair workshop	*Yes, but no tools available*
	Meter test bench	*No, but they use 20 ljerry can in the field to "calibrate"*
	Meter repairs/month/year	*Difficult to say,but they started a task force and they did a lot, but now no parts, no money*
	Meter calibration	*20 l jerrycan through the meter at the connection site*
	Meter test request by consumers?	*Yes, but rarely and then on site. Charge Kshs 500* *If meter wrong no adjustment in the billing. It has never happened*
	List of tools and repair equipment available?	*No*
4.	**Requisition Procedures**	*Normal GOK procurement procedures, complicated, time consuming, with delay in supply.*

CONSUMER ACCOUNT INFORMATION DATA

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

Total No. Of Connections	ARREARS (Kshs.)	JUNE BILL (Kshs.)	CONSUMER NEVER CONNECTED	METERED	FLAT RATE	WORKING	NON-WORKING	NO WATER	CUT OFF	ACTUAL CONSUMPTION (JUNE 2000) M^3	ESTIMATE CONSUMPTION M^3	LAST PAYMENT (Kshs.)
1,394	8,664,102.00	564,742.00	61	999	289	371	495	232	249	13,025	10,783	2,085,906.00

No. Of Actual Bills	399
No. Of Estimate Bills	539
Assumed In-Active	395
Never Connected	61
Total	1,394
Minimum Charged Bills	67.27%

Total Of Active & Inactive
1333

Adjustment:									(28)	(2,182)	1,790	
	8,664,102.00	564,742.00	61	999	289	371	495	232	221	10,843	12,573	2,085,906.00

Total m3 Billed
23,416

NOTE:

a) While last payment column was supposed to reflect payments prior to 30th June 2000, payments are reflected upto 10th December 2000, and are therefore not suitable to undertake a meaningful ageing analysis

b) For 938 accounts actual or estimated consumption was recorded. An additional 26 accounts had an actual or estimate consumption, but no bill was reflected. Only 11 out of these 26 accounts are on cut off. For the remaining 15 accounts it is not clear why no bill was recorded

c) 179 out of 289 flat rate accounts had no estimated consumption recorded. 10 cbm per account (1,790 cbm) was added to the total estimate consumption.

d) 107 accounts were double booked with identical actual and estimated consumption. Actual consumption has therefore been reduced by 1,560 cbm.
33 accounts were double booked with different actual and estimated consumption. For analysis actual consumption was ignored and the estimate used. Actual consumption has therefore been reduced by a further 622 cbm, resulting in a total reduction of 2,182cbm.

e) The 249 accounts reported as cut off were reduced by 28 Nos. relating to 18 accounts with estimate consumption and bills and 10accounts with actual consumption and

NAROK

TABLE: 8.1.1

CONSUMER ACCOUNT INFORMATION DATA

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

A/C No.	ARREARS (Kshs.)	JUNE BILL (Kshs.)	CONSUMER NEVER CONNECTED	METERED	FLAT RATE	WORKING	NON-WORKING	NO WATER	CUT OFF	CUT OFF DATE	ACTUAL CONSUMPTION (JUNE 2000) M^3	AVERAGE CONSUMPTION M^3	LAST PAYMENT (Kshs.)	DATE OF LAST PAYMENT
1	16,375.00	8,690.00		1		1					432		6,800.00	10/3/00
2	4,668.00	250.00		1		1			1	7/3/00	7			
3		250.00		1		1					10			
4		250.00		1		1					10		1,400.00	10/2/00
5			1											
6	4,423.00	560.00		1		1					22		3,000.00	7/8/00
7		650.00		1			1					25	10,000.00	12/6/00
8	250.00	500.00		1			1					10	500.00	12/7/00
9	2,345.00	250.00		1			1					10	225.00	15/9/99
10	3,525.00	250.00		1			1					10	500.00	22/6/00
11	1,214,700.00	30,150.00		1		1					500		12,600.00	27/7/00
12		7,550.00		1		1					152		23,000.00	31/7/00
13		275.00		1		1					10		1,050.00	14/8/00
14			1											
15	2,969.00	250.00		1			1					10	1,000.00	31/3/00
16	1,500.00	250.00		1			1					10	500.00	4/4/00
17	1,000.00	250.00		1			1					10	1,000.00	17/3/00
18	6,800.00	500.00		1		1					20		1,000.00	24/7/00
19	2,625.00	500.00		1		1								
20		740.00		1			1					60	10,000.00	12/6/00
21									1	4/14/00				
22		1,805.00		1		1					56		39,437.00	14/8/00
23									1	7/3/00			1,000.00	19/8/00
24	685.00	200.00			1									
25									1	7/3/00				
26		800.00		1			1					30	2,055.00	3/7/00
27	1,000.00	250.00		1								10	1,500.00	25/4/00
28	3,420.00	890.00		1		1					33		5,000.00	12/9/00
29	7,800.00	1,235.00		1		1					210		7,800.00	22/8/00
30	1,000.00	250.00		1		1					10		640.00	18/3/00
31									1	11/29/98				
32	2,085.00	770.00		1		1					29		1,500.00	10/9/00
33	4,162.00								1	8/9/00				
34	3,090.00								1	5/15/00				
35	4,260.00								1	11/30/98				
36			1											
37	6,839.00			1					1	10/3/95				
38	8,330.00			1					1	12/17/99				
39		500.00		1			1						500.00	28/8/00
40	5,200.00	500.00		1			1					20	9,376.00	12/6/00
SUB-TOTAL	**1,309,051.00**	**59,315.00**	**3**	**29**	**1**	**15**	**11**	**0**	**10**		**1,501**	**205**	**141,383.00**	

CONSUMER ACCOUNT INFORMATION DATA

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

A/C No.	ARREARS (Kshs.)	JUNE BILL (Kshs.)	CONSUMER NEVER CONNECTED	METERED	FLAT RATE	WORKING	NON-WORKING	NO WATER	CUT OFF	CUT OFF DATE	ACTUAL CONSUMPTION (JUNE 2000) M^3	AVERAGE CONSUMPTION M^3	LAST PAYMENT (Kshs.)	DATE OF LAST PAYMENT
1387		250.00		1		1					10	10		
1388			1	1										
1389	2,080.00	200.00			1								1,000.00	7/9/00
1390	1,760.00	200.00			1								1,950.00	15/9/00
1391	1,800.00	450.00		1		1					18	15		
1392	1,200.00	200.00			1									
1393	1,880.00	200.00			1									
1394			1											
SUB-TOTAL	**8,720.00**	**1,500.00**	**2**	**3**	**4**	**2**	**0**	**0**	**0**		**28**	**25**	**2,950.00**	

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

Year 2000	January	February	March	April	May	June	Comment
Total Prod. M^3	39,373	39,871	40,652	39,393	38,503	39,973	Ø 39,628
							Verified using daily occurance book
Water Sold M^3	7,504	8,463	8,540	8,739	8,463	8,463	Ø 8,362
							Verified using consumer ledger
Flat rate M^3	5,922	6,200	6,202	6,500	6,133	5,083	Ø 6,007
Kiosk m^3	600	600	600	600	600	600	Ø 600
							Verified using consumer ledger
Unaccounted for W.	16,435 41.74%	14,583 36.57%	15,261 37.54%	13,512 34.30%	24,551 63.76%	16,845 42.14%	Ø 16,865 Ø 42.67
							Verified using consume ledger
No production days	-	-	-	-	-	-	
No. of Disconnections	-	-	-	-	2	-	
No. of Reconnections	-	-	2	-	-	-	
KWH Consumed	40,000	40,000	39,000	40,000	40,000	40,000	
Revenue							
New connections							
Reconnections			5,000.00				
Metered	192,780.00	211,960.00	213,600.00	217,580.00	271,860.00	211,960.00	
Flat	102,600.00	102,600.00	102,600.00	102,600.00	102,600.00	102,600.00	
Kiosks	9,000.00	9,000.00	9,000.00	9,000.00	9,000.00	9,000.00	
Total Revenue	**304,380.00**	**323,560.00**	**326,200.00**	**329,180.00**	**383,460.00**	**323,560.00**	
							Refer to totals in table 1
Expenditure							
Fuel	210,400.00	210,400.00	210,400.00	210,400.00	210,400.00	210,400.00	
Chemicals	35,050.00	80,323.00	43,759.00	80,323.00	87,881.00	87,881.00	
Repairs,spares							
Workshop,uniform	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	
Replacement of Equip	10,000.00	10,000.00	10,000.00	15,000.00	15,000.00	10,000.00	
Tel.Stationery,Transport	15,000.00	15,000.00	15,000.00	10,000.00	10,000.00	15,000.00	
Allowances	23,000.00	23,000.00	23,000.00	23,000.00	23,000.00	23,000.00	
Total Expenditure	**313,456.00**	**358,723.00**	**322,159.00**	**358,723.00**	**366,181.00**	**366,281.00**	
Revenue Collected	389,245.00	172,433.00	270,108.00	576,527.00	544,393.00	423,702.00	

1) Information absorbed from the O & M monitoring report in Narok and compared with table 1 information from the consumer ledger and daily occurance book concerning production.

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

Year 2000	January	February	March	April	May	June	Comment
Total Prod. M³	39,373	39,871	40,652	39,393	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	37,372	36,058	35,431	[illegible]
Water Sold M³	7,504	8,463	8,540	8,739	8,463	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	13,025	[illegible]
Flat rate M³	5,922	6,200	6,200	6,500	6,133	[illegible]	[illegible]
Kiosk m³	600	600	600	600	600	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	10,783	[illegible]
Unaccounted for W	16,435	14,583	15,261	13,512	24,551	[illegible]	[illegible]
	41.74%	36.57%	37.54%	34.30%	63.75%	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	12,623.00 34.65%	[illegible]
No production days	-	-	-	-	-	-	
No. of Disconnections	-	-	-	-	[illegible]	-	
No. of Reconnections	-	-	[illegible]	-	-	-	
KWH Consumed	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Revenue							
New connections							
Reconnections			[illegible]				
Metered	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Flat	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Kiosks	9,000.00	9,000.00	9,000.00	9,000.00	9,000.00	[illegible]	
Total Revenue	**304,380.00**	**323,560.00**	**326,200.00**	**329,180.00**	**383,460.00**	**323,560.00**	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	**564,742.00**	Refer to totals in table [illegible]
Expenditure							
Fuel	[illegible]	210,400.00	[illegible]	[illegible]	[illegible]	[illegible]	
Chemicals	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Repairs spares							
Workshop uniform	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Replacement of Equip	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Tel. Stationery Transport	15,000.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Allowances	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Total Expenditure	**313,456.00**	**358,723.00**	**322,159.00**	**358,723.00**	**366,181.00**	**366,231.00**	
Revenue Collected	389,245.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

1) Information absorbed from the O & M monitoring report in Narok and compared with table 1 information from the consumer ledger and daily occurance book concerning production.

NAROK

BILLING AND REVENUE COLLECTION DATA

TABLE: 8.3.1

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	4,235,072.00	4,489,465.00	4,766,992.00	4,644,425.00	4,614,533.00	4,713,778.00
Current month billed revenue	295,000.00	290,000.00	299,000.00	295,000.00	300,000.00	290,000.00
Total revenue collectable	4,530,072.00	4,779,465.00	5,065,992.00	4,939,425.00	4,914,533.00	5,003,778.00
Accumulated FY collection	3,400,458.00	2,856,065.00	2,279,538.00	2,107,105.00	1,836,997.00	1,447,752.00
Total outstanding revenue	4,103,052.00	4,235,072.00	4,489,465.00	4,766,992.00	4,644,425.00	4,614,533.00

Total Collection FY = (Kshs) 3,827,478.00

YEAR 1999

	DECEMBER	NOVEMBER	OCTOBER	SEPTEMBER	AUGUST	JULY
Accumulated Debt						
Current month billed revenue						
Total revenue collectable						
Accumulated FY collection						
Total outstanding revenue						

1) The shaded box is the only reliable information that can be obtained as it is monitored by the 2 offices i.e. Water Department and the District Accountants office

2) The monthly billed is estimated and not clear how, but explained by the fact that the form has to be sent to H.Q before they find the time to compile everything through the various consumer ledgers.

3) The other accumulated figures are therefore based on adding monthly estimates to the already brought forward figures and errors are carried forward from one month to another thus one year to the next

=> **Average monthly billed revenue per month between 1 - 6 / 2000 = Kshs. 294,833.00. It is to be noted that the average for the whole FY cannot be calculated as not available.**

=> **Average collection per month during FY 99/00 = Kshs. 318,956.50**

NAROK BILLING AND REVENUE COLLECTION DATA TABLE: 8.3.1

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	4,235,072.00	4,489,465.00	4,766,992.00	4,644,425.00	4,614,533.00	4,713,778.00
Current month billed revenue	295,000.00	290,000.00	299,000.00	295,000.00	300,000.00	290,000.00
Total revenue collectable	4,530,072.00	4,779,465.00	5,065,992.00	4,939,425.00	4,914,533.00	5,003,778.00
Actual collection	427,020.00	544,393.00	576,527.00	172,433.00	270,108.00	389,245.00
Accumulated FY collection	3,400,458.00	2,856,065.00	2,279,538.00	2,107,105.00	1,836,997.00	1,447,752.00
Total outstanding revenue	4,103,052.00	4,235,072.00	4,489,465.00	4,766,992.00	4,644,425.00	4,614,533.00

Total Collection FY = (Kshs) 3,827,478.00

YEAR 1999

	DECEMBER	NOVEMBER	OCTOBER	SEPTEMBER	AUGUST	JULY
Accumulated Debt						
Current month billed revenue						
Total revenue collectable						
Actual collection	337,100.00	452,990.00	150,692.00	314,653.00	62,460.00	129,857.00
Accumulated FY collection						
Total outstanding revenue						

1) The shaded box is the only reliable information that can be obtained as it is monitored by the 2 offices i e Water Department and the District Accountants office

2) The monthly billed is estimated and not clear how, but explained by the fact that the form has to be sent to H Q before they find the time to compile everything through the various consumer ledgers

3) The other accumulated figures are therefore based on adding monthly estimates to the already brought forward figures and errors are carried forward from one month to another thus one year to the next

=> Average monthly billed revenue per month between 1 - 6 / 2000 = Kshs. 294,833.00. It is to be noted that the average for the whole FY cannot be calculated as not available.

=> Average collection per month during FY 99/00 = Kshs. 318,956.50

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
D. Hospital	11	1,214,700.00
	188	316,587.00
MOLG	21	No arrears stated
	22	No arrears stated
	37	6,839.00
M.O. Education	906	1,080,694.00
G.K. Prison	41	142,249.00
Police	12	No arrears stated
Forest Department	145	146,970.00
M.O.P.W	267	55,153.00
	1106	52,647.00
N.C.& P. Board	338	3,000.00
Narok V. Polytechnic	266	4,750.00
	300	14,890.00
Teachers College	1077	1,490.00
Kuldan Singh	867	6,285.00
	965	89,950.00
	1013	114,095.00
	1021	1,000.00
	1022	2,283.00
	1023	2,055.00
	1024	3,579.00
	1025	8,847.00
	1063	994.00
Sub - Total:		**3,269,057.00**

Total outstatnding minor consumers	4,097,179.00
Total outstatnding major consumers	4,566,923.00
total outstanding as at June 2000	8,664,102.00
Number of billable connections	854
Number of minor consumer connections	792
Number of major consumer connections	62
Average outstanding / minor consumer	5,173.21
Average outstanding / major consumer	73,660.05

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

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

ACCOUNT NUMBER	OUTSTANDING AS AT JUNE 2000	ACCOUNT NUMBER	OUTSTANDING AS AT JUNE 2000	ACCOUNT NUMBER	OUTSTANDING AS AT JUNE 2000
1	16,375.00	1041	1,810.00	458	99,905.00
29	7,800.00	1130	151,670.00	309	28,890.00
81	10,745.00	1154	39,545.00	319	41,360.00
116	4,100.00	1185	6,815.00	353	20,068.00
128	13,800.00	1186	10,425.00	362	28,281.00
215	27,850.00	1187	3,140.00	369	21,879.00
302	48,220.00	1189	3,305.00	383	27,046.00
336	243,175.00	1058	35,255.00	399	54,598.00
342	No arrears stated ?	957	32,490.00	419	24,565.00
480	79,480.00	933	22,905.00		
527	No arrears stated ?	928	25,657.00		
800	3,900.00	748	22,975.00		
871	16,420.00	641	26,595.00		
880	69,296.00	477	27,526.00		
		Sub - Total:	**1,297,866.00**		
		Total:	**4,566,923.00**		

NAROK

REVENUE, A.I.E. ALLOCATION AND EXPENDITURE

TABLE: 8.5.1

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	
July	129,857.00			
August	62,460.00		404,100.00	
Sept.	314,653.00			
Oct.	150,692.00			
Nov.	452,990.00			
Dec.	337,100.00		452,880.00	
Jan.	389,245.00			
Feb	270,108.00			
March	172,433.00		430,000.00	
April	576,527.00			
May	544,393.00			
June	427,020.00			
Total	**3,827,478.00**		**1,286,980.00**	

EXPENDITURE INCURRED FY 99/00

ITEM	ALLOCATED	ACTUAL
887 Account		
Transport & Operating Exp.	70,000.00	69,877.50
Passage & Leave Exp.	200,000.00	199,628.50
Travelling & Accom. Exp	105,000.00	104,855.00
Fuel & Gas	200,000.00	199,715.70
Purchase of Stationery	45,000.00	45,000.00
Postal & Telegrams	10,000.00	9,922.00
Purchase of Uniforms	22,880.00	22,880.00
Renewal of W/S (fittings)	144,000.00	143,996.00
Maintenance of buildings & stat.	40,000.00	39,954.00
Maintenance of Water Supplies	320,000.00	320,000.00
894 Account		
Transport Operating Exp.	100,000.00	99,997.00
Maintenance of Water Supplies	30,100.00	30,092.00
Total	**1,286,980.00**	**1,285,917.70**
Balance		**1,062.30**

Percentage allocated to Narok as A.I.E. is 64%

1) Collection * 64% = 3,827,478.00 * 64% = 2,449,585.92 less received Kshs. 1,286,980.00, balance Kshs. 1,162,605.92 is retained by GOK

2) An A.I.E. does not represent instant liquidity because liquidity relates to liquidity at the District Treasury. The revolving fund in Narok was Kshs. 4 million and has to cater for all district expenditure

3) Approx 10% of expenditure incured relates to the other divisions, but statement made that most communities don't pay for the water and in return takecare of O&M expenses while the divisional officers only provided technical advice.

NAROK

CHEMICALS THROUGH MENR H/Q DATA

TABLE: 8.6.1

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

MONTH	ORDERED(TONNES)			RECEIVED(TONNES)		
	Alum	TCL	S/Ash	Alum	TCL	S/Ash
Jul-99	4	1.2		4	1.2	
Aug-99	5			5		
Sep-99						
Oct-99	5	1		5	1	
Nov-99	7			7		
Dec-99						
Jan-00	1			1		
Feb-00	2			2		
Mar-00						
Apr-00	6		1	6		1
May-00						
Jun-00	2			2		
Total	**32**	**2.2**	**1**	**32**	**2.2**	**1**

Stock Balance as at end June 2000

Alum	TCL	S/Ash
Nil	**1.4**	**Nil**

Even though chemicals are supplied through H.Q., below AIE was received by the water section

Purchase of Supplies for Production

Account No. 0-886-750-1501

Allocation: 445,200.00

Expenditure: 444,959.00

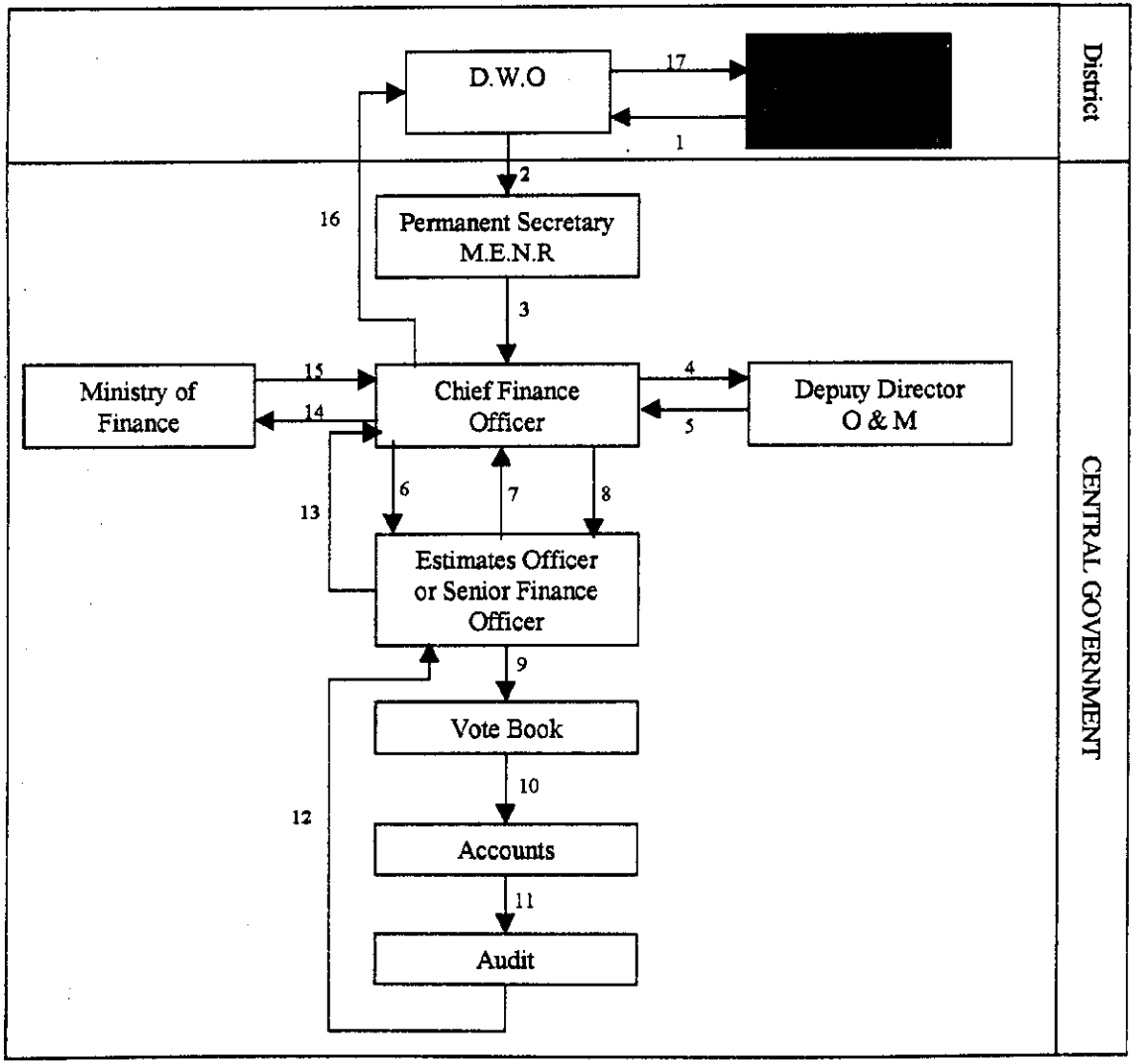
195,000.00 paid debt on chemicals
249,949.00 maintenance of water supply

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



13/2/01 11:10 PM

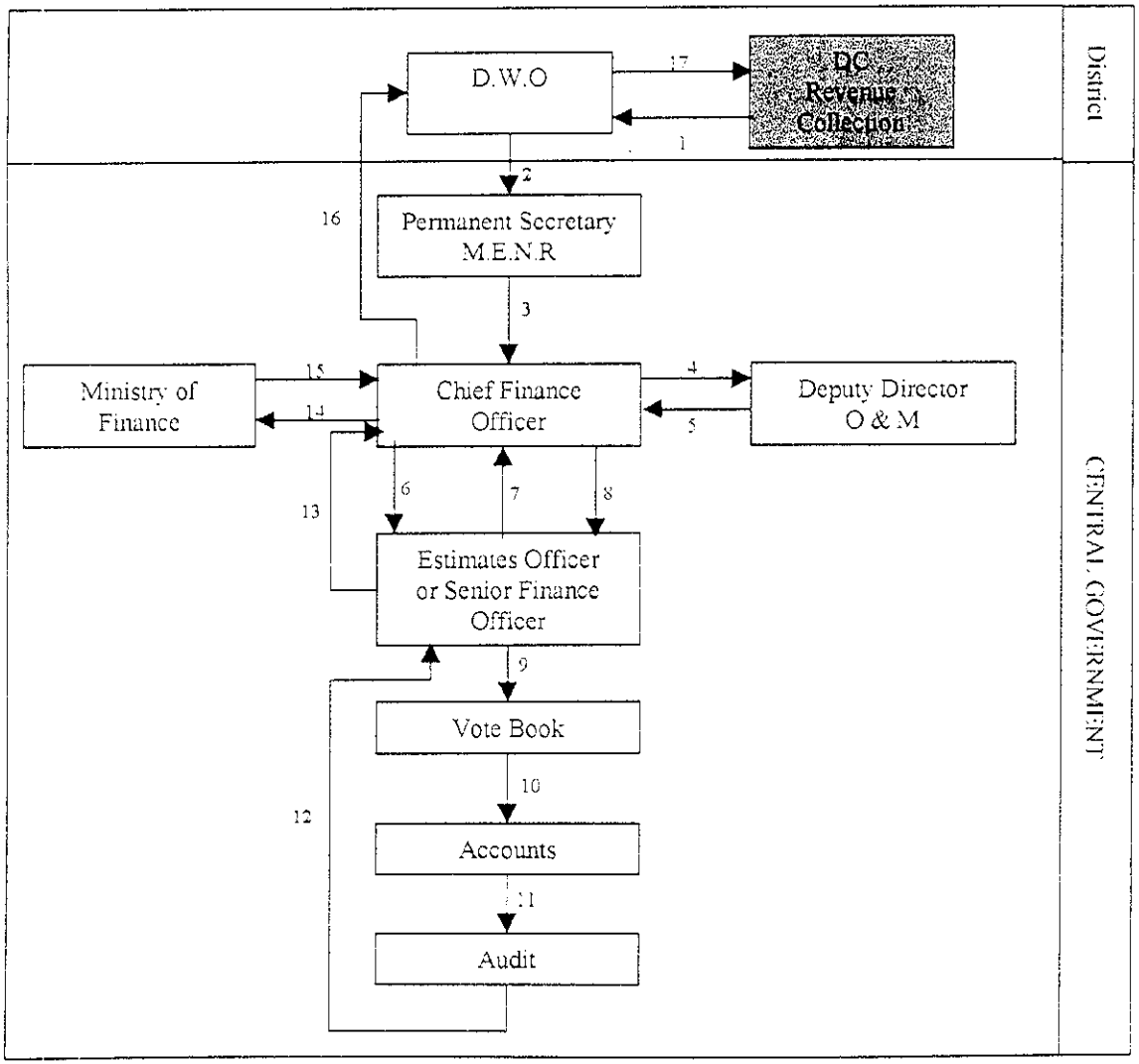
A.I.E = Authority to Incur Expenditure

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.

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

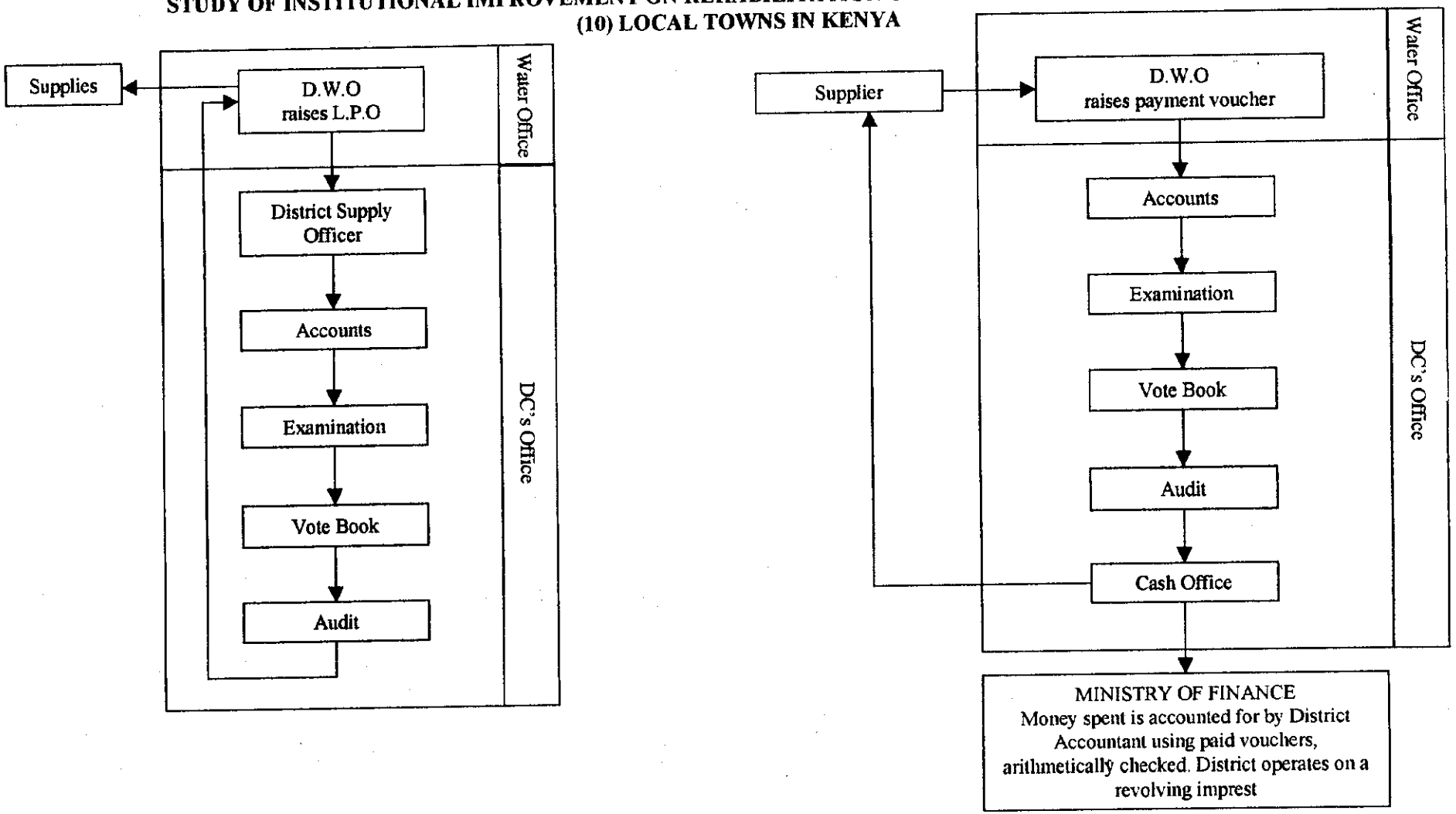
1) DC forwards form F.O. 17 to the DWO containing the total monthly collection made on behalf of the water department.
2) DWO requests for A.I.E based on form F.O. 17 collection and A.I.E percentage and forwards to P.S. The A.I.E percentage depends on the district and is determined by MENR. The percentage 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.

13/2/01 11:10 PM

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.

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

CONSORTIUM

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

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

Interviewer: LEK and CK

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

Tel.: 0123-31037, 30923

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

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

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

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

Development Impact Consulting

Engineering and Utility Management Ltd.

GIBB Eastern Africa
LAWGIBB Group Member

Gibb Eastern Africa Ltd.

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

CONSORTIUM

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

Location: 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

Development Impact Consulting

Engineering and Utility Management Ltd.

GIBB Eastern Africa

LAWGIBB Group Member

Gibb Eastern Afri

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

CONSORTIUM

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

Location: 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

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

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

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

Development Impact Consulting

Engineering and Utility Management Ltd.

GIBB Eastern Africa

LAWGIBB Group Member

Gibb Eastern Africa Ltd.

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

CONSORTIUM

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

Location: 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

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

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

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

ACTUAL CONSUMER BILLS CALCULATION ANALYSIS SUMMARY TABLE: ST 1.1

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

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

LAMU

	No Of Bills	Correct Bill	No. Of Wrongly Calculated Bills	No. Of Connections without bill and Consp. > 0	Amount Charged	No. Of Different Charges (Kshs.)	No. Of Different Consp. (m^3.)
Between $0m^3$ and $10m^2$	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 $10m^2$	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 $10m^2$	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 $10m^2$	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: ST8.2

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

DETAILS	Units	NAROK		MERU		MURANGA		KABARNET		MAKINDU		WUNDANYI		MIGORI		LAMU		WEBUYE		MUMIAS	
Total Population	No.	43,000		130,100		60,000		17,500		6,400		7,200		99,700		12,000		73,000		110,400	
Total Staff	No.	34		48		56		29		10		35		29		17		28		13	
Total Active + In-active Accounts	No.	1,333		3,225		2,933		768		438		1,136		669		837		1,852		1,439	
Ratio (accounts per staff)	No.	39.21		67.19		52.38		26.48		43.80		32.46		23.07		49.24		66.14		110.69	
No of A/C transferred to community	No.	-		-		-		-		136		-		133		-		Not available		-	
Metered Accounts	No.	999		2,644		2,930		470		423		1,114		213		800		1,846		1,603	
Working	No.	371		272		1,449		206		115		493		79		104		7		8	
Non-working	No.	495		2,225		1,441		161		104		290		136		697		1,509		1,284	
Unmetered Accounts	No.	289		463		2		-		23		-		456		35		433		104	
Actual Billed Accounts	No.	399	48.19%	110	4.77%	1,433	49.65%	206	36.20%	107	47.77%	427	68.81%	26	12.15%	95	13.46%	4	0.55%	4	0.61%
Estimate Billed Accounts	No.	539	65.10%	2,196	95.23%	1,453	50.35%	363	63.80%	117	52.23%	192	31.19%	188	87.85%	608	86.54%	729	99.45%	650	99.39%
Dis-connected Accounts	No.	221		263		36		199		198		357		220		95		767		528	
Major / Minor Consumers	No.	20/918		25/2281		28/2858		12/557		14/210		8/611		3/211		2/701		3/730		9 / 1597	
Minimum charged bills	%	67.27%		15.43%		63.77%		34.54%		19.93%		67.04%		53.01%		78.14%		12.37%		18.41%	
Production capacity per month	m^3	72,000		150,000		100,800		420,000		14,400		46,080		14,400		90,000		54,000		42,900	
Actual Production June 2000	m^3	36,431		132,000		82,500		51,000		12,180		21,600		5,400		22,833		27,120		21,180	
Production efficiency	%	50.60%		88.00%		81.85%	Capacity not used			84.58%		46.88%		37.50%		25.37%		50.22%		49.37%	
Total consumption June 00	m^3	23,418		45,056		41,028		11,500		7,182		10,020		5,592		7,904		27,013		31,556	
Actual	m^3	10,843		2270		21,114		5,402		2,652		5,710		392		1,294		245		245	
Estimate	m^3	12,573		42786		19,914		6,098		4,530		4,310		5,200		6,510		26,768		31,311	
UFW June 2000	m^3	13,015		86,944		41,472		39,500		4,998		11,580	consumed > produced			15,029		107		consumed > produced	
UFW	%	35.73%		65.87%		50.27%		77.45%		41.00%		53.61%				65.82%		0.39%			
Value of water lost	Kshs.	313,892.94		2,206,726.10		1,288,842.37		1,313,663.91		193,022.76		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	%	84.27%		34.13%		49.73%		22.55%		56.96%		49.58%		>100%		34.18%		99.61%		>100%	
Collected revenue June 2000	Kshs.	427,020.00		428,315.00		1,108,326.00		328,123.00		66,612.00		228,720.00		32,258.00		100,935.00		178,228.00		132,696.00	
Collection efficiency June 2000	Kshs.	75.61%		37.42%		86.92%		85.80%		24.12%		53.95%		34.81%		34.52%		21.96%		18.39%	
Average Tariff June 2000 / m^3	Kshs.	24.12		25.40		31.08		33.25		38.63		42.31		16.57		37.47		30.04		22.87	
Total Debtors end May 2000	Kshs.	8,664,102.50		20,412,091.50		12,841,260.80		1,639,626.00		6,597,732.65		3,289,084.15		940,349.00		3,137,731.00		2,357,599.95		2,020,145.95	
HQ Reporting end May 2000	Kshs.	4,235,072.00		40,094,320.50		13,808,023.90		1,539,959.00		7,317,723.10		3,716,960.00		609,915.30		2,436,479.00		355,421.00		1,552,762.00	
Major consumers:																					
G.O.K	%						61.42%		Not available		N/A		46.08%		Not available		Not available		0.64%		Not available
(Others Consumption >100m3 or arrears >20,000.00)	%		3.26%		52.94%		10.98%		50.35%		91.60%		2.04%		15.98%		43.20%		1.40%		5.37%
Minor Consumers	%		96.74%		47.06%		27.60%		49.65%		8.40%		51.88%		84.02%		56.80%		97.96%		94.63%
AIE percentage	%		64%		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				2,173,738.00		730,954.00		1,295,717.00		2,163,140.00		
AIE earned FY 99/00	Kshs.		2,449,586.92		4,063,185.60		6,010,847.38		N/A				1,412,929.70		475,120.10		1,166,145.30		1,382,778.20		
AIE received FY 99/00	Kshs.		1,286,980.00		3,956,986.00		6,022,560.00		N/A				2,535,300.00		823,460.00		1,269,860.00		Not available		Not available
AIE Expenditure:		**Kshs:**	**%**	**Kshs:**	**%**	**Kshs:**	**%**	**Kshs:**	**%**	**Kshs:**	**%**	**Kshs:**	**%**	**Kshs:**	**%**	**Kshs:**	**%**	**Kshs:**	**%**	**Kshs:**	**%**
Transport & staff related expenses	Kshs.	497,238.00	38.67%	765,085.70	19.86%	1,910,296.65	38.61%	217,863.35	26.54%			344,413.25	15.81%	399,494.00	50.94%	377,321.60	29.83%				
O&M	Kshs.	534,042.00	41.53%	2,420,062.50	62.81%	2,490,248.25	50.33%	200,470.00	24.42%			1,119,580.65	51.40%	320,280.60	40.84%	854,179.50	67.53%				
Postage	Kshs.	9,922.00	0.77%	31,953.20	0.83%	22,736.00	0.46%	3,537.40	0.43%			94,960.00	4.36%	15,400.00	1.96%	18,400.00	1.45%	Not available			
Telephone	Kshs.	-		152,208.90	3.95%	55,000.00	1.11%	235,643.25	28.71%			89,200.00	4.10%	-		-					
Purchase of Meters	Kshs.	-		63,927.80	1.66%	99,000.00	2.00%	-				34,999.00	1.61%	-		-					
Stationery	Kshs.	45,000.00	3.50%	104,136.50	2.70%	65,854.00	1.33%	6,290.00	0.77%			65,000.00	3.00%	49,121.00	6.26%	14,945.00	1.18%				
Fuel & Gas	Kshs.	199,715.70	15.53%	315,690.50	8.19%	304,286.50	6.15%	157,032.00	19.13%			409,947.20	18.82%			-					
AIE Expense:	Kshs.	1,285,917.70	2	3,853,067.10	1	4,947,421.40	2	820,836.00	3		4	2,178,100.10	2	784,295.60	2	1,264,846.10	2		4		4

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

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

x Calculated figures (Arrived at using provided figures)

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

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

} Information obtained from vote book and grouped

PROBLEM – SYMPTOM – CAUSE – RECOMMENDATION MATRIX

SUMMARY TABLE: ST 8.3

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

Problems '	Symptoms	Cause	Recommended Change
1. Organization Structure			
Office Set-up Lack of decent or sufficient office space, Lacking equipment, Lacking or delayed stationery, No calculators, No computers.	• Messy office environment. lost files, limited communication. • Low staff morale. • Reduced efficiency. • Delayed billing, wrong billing calculation. • Delayed consumer problem attendance. • No data base.	• Insufficient funding. • Delays in A.I.E. processing. • Centralised GOK printing. • Centralised decision-making.	• Decentralise decision-making process. • Change funding procedure. • Arrange for decent office space
Staffing Set-up 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.	• Reduced efficiency. • Low staff morale. • No commercial approach. • Lacking understanding of commercial operations.	• 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.	• 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.
Transport No or limited transport	• Certain field operations not possible. • Delayed reaction time to field operations • Reduced control over field activities	• Insufficient funding • Lack of planning on Asset Maintenance i.e. grounded vehicles. • No planning on transport requirement.	• 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			
Consumer Management 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	• 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	• 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	• 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
Meter Reading 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	• Low reliability of information found • High % of all connections are estimated. • High number of connections on minimum • Wrong billing	• 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	• 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.
Billing Wrong billing, Delayed tariff implementation not retroactively implemented, Delayed stationary, Unskilled staff and no calculators, High number of estimated bills	• Low billing efficiency • Increased UfW. • Wrongly calculated bills • Reduced collection efficiency due to consumer disputes and complaints • Inconsistent calculations • Delayed billing	• 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	• 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.
Dis-connection 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	• Low collection	• 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	• 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
Illegal Connection / Illegal re-connection Suspected high rate of illegal connection and re-connection, no transport	• High UfW • Low rate of re-connection statistics.	• 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	• 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
Debt Arrears Very high debt arrears Unreliable Records, Lacking debt substantiation, GOK the biggest debtor	• Monthly increasing debt while no systematic disconnection • Unrealistically high monthly consumption of GOK institutions (hospital, police, prison)	• 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	• 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
Revenue Collection Wrong bills, bills lack due date remark, consumers have no payment moral	• Low collection efficiency • High consumer complaints	• 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	• 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
UfW 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	• High UfW. • Estimated unaccounted for water, as no production figures details available • Limited supply, as high percentage of water lost	• Master meters defunct or non-existent • Majority of consumer meters defunct • Poor maintenance of the reticulation system	• 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
Funding Delay in A.I.E. Shortage of funds available	• Chronic shortage of everything required for office and field operation	• AIE earned is not equal AIE received • Lengthy and delayed AIE processing procedure. With involvement of District Administration • Limited liquidity at the DC's office • Centralized procurement through HQ • GOK procurement procedures • Low billing and collection efficiency • Reporting to the HQ does not depict the actual status quo • Information received by the HQ is not used as a management tool for concerned planning and control • Receipt of extra AIE depends on political interests and efforts / stamina of DWO	• Decentralise AIE procedures to district level and transfer efficient and stringent control to the provincial level • Cash retainer out of revenue collections to remain at the water supply system • Simplify AIE procedures • Decentralise procurement to system level • Simplify GOK procurement procedures • Involve an external consultant/ market price analyst to give annual pricing guidelines and limitations • Setup positive and negative staff sanctioning system • Use mismanagement of funds as a retrenchment criteria

PROBLEM – SYMPTOM – CAUSE – RECOMMENDATION MATRIX

Problems	Symptoms	Cause	Recommended Change
Costs 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	• Costs > collected revenue • Inflated tenders • Inflated costs • Very high power bills	• 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 •	• 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
Financial Control No HQ control over AIE is spending, No HQ control over billing,	• 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	• 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	• 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
Stock Procurement procedure, shortage level, no stock management, no summarised stock movement records	• 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	• Insufficient funding • GOK procurement procedure • Centralized procurement • Neglect of divisional systems	• 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			
Consumer Meter servicing Lacking materials, tools and skill, No meter servicing facilities, No transport, buried meters	• High UfW • Majority of meters estimated for billing • Low billing efficiency	• No servicing schedule • No field control • Wrong priorities and AIE spending not controlled • Low staff moral • No staff planning • No technical guidance available	• 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
Master Meter servicing Lacking materials, tools and skill, Insufficient information about the existing network	• Lack of reliable production details	• No system level skill • No parts at provincial level • No efforts made by staff • Insufficient funding	• Improve on funding procedure • Outsource servicing, pegged to supply / tenders of the master meters • Look into economies of scale under provincial officer
Pipe Network servicing No transport No tools No materials, skill, "Spaghetti" consumer lines, No location information and network plans	• Delayed attendance to burst and leaks • High UfW	• Mixed network piping material • No planned network design • No technical guidance available / manual • No preventive maintenance on network appurtenances • Insufficient funding • No stock management	• 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
Source & T-Works High power consumption, Power rationing, damage caused by uncontrolled power surges, system neglect	• Pumps not working • Laboratory not operational • Water quality questionable • Dosing system not functioning • Reduced production / pumping hours	• 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	• 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			
Data is copied from one month to the next and from one year to the next, No adequate filing system for returns	• No control nor planning tool • Information not readily available.	• Outdated report format (quantity not quality)	• 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 e.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		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	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											x	MENR	x	→	→	→
19.	Introduce penalties for illegal consumers through the water under taker											x	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
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		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		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 Povincial 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 Povincial 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		Consultant		→		
36.	Propose outsourcing criterias for pump maintenance depending on the pump capacity.												Consultant		→		
37.	Include consumer lines into the planned network	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		Consultant and MENR		→	→	→
39.	Introduce retainer security on contracted civil works and quality control	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 A4
NAROK TOWN

Table A 4-1: Water Demand projection for Narok Town Water Supply

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	41,200	High	11.3	4,656	250	1,164					
		Middle	41.8	17,222	150	2,583	300	**5,496**	2,500	1,500	360
		Low	46.9	19,323	75	1,449					
2000	43,000	High	11.3	4,859	250	1,215					
		Middle	41.8	17,974	150	2,696	300	**5,723**	2,500	1,500	360
		Low	46.9	20,167	75	1,513					
2001	44,900	High	11.3	5,074	250	1,268					
		Middle	41.8	18,768	150	2,815	300	**5,963**	2,500	1,500	360
		Low	46.9	21,058	75	1,579					
2002	47,000	High	11.3	5,311	250	1,328					
		Middle	41.8	19,646	150	2,947	300	**6,228**	2,500	1,500	360
		Low	46.9	22,043	75	1,653					
2003	49,100	High	11.3	5,548	250	1,387					
		Middle	41.8	20,524	150	3,079	300	**6,493**	2,500	1,500	360
		Low	46.9	23,028	75	1,727					
2004	51,300	High	11.3	5,797	250	1,449					
		Middle	41.8	21,443	150	3,217	300	**6,770**	2,500	1,500	360
		Low	46.9	24,060	75	1,804					
2005	53,600	High	11.3	6,057	250	1,514					
		Middle	41.8	22,405	150	3,361	300	**7,060**	2,500	1,500	360
		Low	46.9	25,138	75	1,885					
2006	56,000	High	11.3	6,328	250	1,582					
		Middle	41.8	23,408	150	3,511	300	**7,363**	2,500	1,500	360
		Low	46.9	26,264	75	1,970					
2007	58,500	High	11.3	6,611	250	1,653					
		Middle	41.8	24,453	150	3,668	300	**7,678**	2,500	1,500	360
		Low	46.9	27,437	75	2,058					
2008	61,200	High	11.3	6,916	250	1,729					
		Middle	41.8	25,582	150	3,837	300	**8,019**	2,500	1,500	360
		Low	46.9	28,703	75	2,153					
2009	63,900	High	11.3	7,221	250	1,805					
		Middle	41.8	26,710	150	4,007	300	**8,359**	2,500	1,500	360
		Low	46.9	29,969	75	2,248					
2010	66,800	High	11.3	7,548	250	1,887					
		Middle	41.8	27,922	150	4,188	300	**8,725**	2,500	1,500	360
		Low	46.9	31,329	75	2,350					

Table A 4-2: BUSINESS PLANS FOR NAROK TOWN WATER SUPPLY

CASH FLOWS

Year	1	2	3	4	5	6	7	8	9	10	
REVENUE GENERATED											
Revenue from Extra Water Sold	3,127,685	14,077,685	14,077,685	14,077,685	14,077,685	14,077,685	14,077,685	14,077,685	14,077,685	14,077,685	
Revenue from Unaccounted for Water	2,628,000	4,380,000	5,748,750	5,748,750	5,748,750	5,748,750	5,748,750	7,117,500	7,117,500	7,117,500	
Savings from Collection Efficiency	-	3,795,994	4,639,548	4,639,548	4,639,548	4,639,548	4,639,548	4,639,548	4,639,548	4,639,548	
Revenue from Sewerage Charges	-	-	-	-	-	-	-	-	-	-	
Total	5,755,685	22,253,679	24,465,983	24,465,983	24,465,983	24,465,983	24,465,983	25,834,733	25,834,733	25,834,733	
Expenditures (Kenya Shilling)											
Transport & Staff Related Expenses	1,036,023	4,005,662	4,403,877	4,403,877	4,403,877	4,403,877	4,403,877	4,650,252	4,650,252	4,650,252	
O&M	1,151,137	4,450,736	4,893,197	4,893,197	4,893,197	4,893,197	4,893,197	5,166,947	5,166,947	5,166,947	
Postage	21,872	84,564	92,971	92,971	92,971	92,971	92,971	98,172	98,172	98,172	
Telephone	52,377	202,508	222,640	222,640	222,640	222,640	222,640	235,096	235,096	235,096	
Purchase of meters	94,393	364,960	401,242	401,242	401,242	401,242	401,242	423,690	423,690	423,690	
Stationery	62,737	242,565	266,679	266,679	266,679	266,679	266,679	281,599	281,599	281,599	
Fuel & Gas	290,662	1,123,811	1,235,532	1,235,532	1,235,532	1,235,532	1,235,532	1,304,654	1,304,654	1,304,654	
Current O&M Costs	(1,285,918)	(1,285,918)	(1,285,918)	(1,285,918)	(1,285,918)	(1,285,918)	(1,285,918)	(1,285,918)	(1,285,918)	(1,285,918)	
Incremental O&M Costs	**1,423,283**	**9,188,889**	**10,230,220**	**10,230,220**	**10,230,220**	**10,230,220**	**10,230,220**	**10,874,491**	**10,874,491**	**10,874,491**	**94,386,747**
Sulplus(Deficit)	**4,332,402**	**13,064,790**	**14,235,763**	**14,235,763**	**14,235,763**	**14,235,763**	**14,235,763**	**14,960,242**	**14,960,242**	**14,960,242**	
Average Tariff (Kshs/m3)	30	30	30	30	30	30	30	30	30	30	
Investment Costs											
Net Cash Flow	**4,332,402**	**13,064,790**	**14,235,763**	**14,235,763**	**14,235,763**	**14,235,763**	**14,235,763**	**14,960,242**	**14,960,242**	**14,960,242**	
Cumulative Cash Flow	**4,332,402**	**17,397,192**	**31,632,955**	**45,868,718**	**60,104,481**	**74,340,245**	**88,576,008**	**103,536,250**	**118,496,492**	**133,456,735**	

Table A 4-3: Financial Cash Flow for NAROK Town Water Supply

Year	Investment Cost	O&M Cost	Total Cost	Water Revenue	Net Revenue
1	65,858,941	1,423,283	67,282,224	5,755,685	(61,526,539.23)
2	84,568,800	9,188,889	93,757,689	22,253,679	(71,504,010)
3	42,539,520	10,230,220	52,769,740	24,465,983	(28,303,757)
4	14,520,000	10,230,220	24,750,220	24,465,983	(284,237)
5		10,230,220	10,230,220	24,465,983	14,235,763
6	-	10,230,220	10,230,220	24,465,983	14,235,763
7	-	10,230,220	10,230,220	24,465,983	14,235,763
8	-	10,874,491	10,874,491	25,834,733	14,960,242
9	-	10,874,491	10,874,491	25,834,733	14,960,242
10	-	10,874,491	10,874,491	25,834,733	14,960,242
Total	207,487,261	94,386,747	301,874,008	227,843,481	(74,030,527)

Average Tariff Rate (Ksh/m3)	**24.12**

FIRR		**-10%**
NPV		**(85,356,240)**
RER		**0.755**

Table A 4-4: Economic Cash Flow for NAROK Town Water Supply

Year	Economic InvestmentCost	O&M Cost	Total Cost	Economic Benefit	Net Revenue
1	68,656,441	1,423,283	70,079,724	44,261,126	(25,818,598)
2	84,568,800	9,188,889	93,757,689	47,803,635	(45,954,053)
3	42,539,520	10,230,220	52,769,740	51,346,145	(1,423,596)
4	14,520,000	10,230,220	24,750,220	55,057,345	30,307,125
5		10,230,220	10,230,220	58,937,237	48,707,016
6		10,230,220	10,230,220	62,985,819	52,755,599
7		10,230,220	10,230,220	67,203,092	56,972,872
8		10,874,491	10,874,491	71,757,747	60,883,256
9		10,874,491	10,874,491	76,312,402	65,437,911
10		10,874,491	10,874,491	81,204,439	70,329,948
Total	**210,284,761**	**94,386,747**	**304,671,508**	**616,868,988**	**312,197,480**

Current Tariff Rate (Ksh/m3)	**30**

EIRR		**38%**
NPV		**220,325,238**
CBR		**0.494**

NAROK TOWN WATER SUPPLY

Table A 4-5: Estimated Benefit of time saved through water carrying.

Year	Population served	Number of Household	Curr Household	Proj Household	Addi Household	Water Carriage Benefit	Health Benefit	Health Costs Saved	Total Benefits
2001	44,900	8,018	1333	3207	1874	32,150,921	8,433,643	3,676,562	44,261,126
2002	47,000	8,393	1333	3357	2024	34,724,171	9,108,643	3,970,822	47,803,635
2003	49,100	8,768	1333	3507	2174	37,297,421	9,783,643	4,265,081	51,346,145
2004	51,300	9,161	1333	3664	2331	39,993,206	10,490,786	4,573,353	55,057,345
2005	53,600	9,571	1333	3829	2496	42,811,528	11,230,071	4,895,637	58,937,237
2006	56,000	10,000	1333	4000	2667	45,752,385	12,001,500	5,231,934	62,985,819
2007	58,500	10,446	1333	4179	2846	48,815,778	12,805,071	5,582,243	67,203,092
2008	61,200	10,929	1333	4371	3038	52,124,242	13,672,929	5,960,576	71,757,747
2009	63,900	11,411	1333	4564	3231	55,432,706	14,540,786	6,338,910	76,312,402
2010	66,800	11,929	1333	4771	3438	58,986,242	15,472,929	6,745,268	81,204,439
Total	**552,300**					**448,088,600**	**117,540,000**	**51,240,388**	**616,868,988**

Current Tariff Ra	Kshs.					30

Note:

The benefits increase with increase in population

Table A 4-6: ESTIMATED WATER REVENUE - NAROK

YEAR	0	1	2	3	4	5	6	7	8	9	10	11
Design production capacity (m^3/day)	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
ditto (million m^3/year)	0.913	0.913	0.913	0.913	0.913	0.913	0.913	0.913	0.913	0.913	0.913	0.913
Expected daily production (m3/day)	1,500	1,500	1,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Current daily production		1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214
Projected population	41,162	43,000	44,900	47,000	49,100	51,300	53,600	56,000	58,500	61,200	63,900	66,800
Projected daily demand (m^3/day)	5,496	5,723	5,963	6,228	6,493	6,770	7,060	7,363	7,678	8,019	8,359	8,725

Average Tariff		**Kshs**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**
Revenue from Extra Water Sold		Kshs	3,127,685	14,077,685	14,077,685	14,077,685	14,077,685	14,077,685	14,077,685	14,077,685	14,077,685	14,077,685
Revenue from Unaccounted for Water		Kshs	2,628,000	4,380,000	5,748,750	5,748,750	5,748,750	5,748,750	5,748,750	7,117,500	7,117,500	7,117,500
Savings from Collection Efficiency		Kshs	-	3,795,994	4,639,548	4,639,548	4,639,548	4,639,548	4,639,548	4,639,548	4,639,548	4,639,548
Revenue from Sewerage Charges		Kshs	-	-	-	-	-	-	-	-	-	-
Total Financial Benefits		Kshs	**5,755,685**	**22,253,679**	**24,465,983**	**24,465,983**	**24,465,983**	**24,465,983**	**24,465,983**	**25,834,733**	**25,834,733**	**25,834,733**

TOTAL FINANCIAL BENEFITS IN 11 YEARS OF ANALYSIS IS **227,843,481**

Table A 4-7: 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	9,263.74
Meru	Meru	5.6	7.1	6	4,753.56
Murang'a	Murang'a	5.3	7.2	5.9	5,871.58
Baringo	Kabarnet	4.5	6.5	5.1	4,861.78
Makueni	Makindu	4.7	7	6.2	2,815.25
Taita-Taveta	Wundanyi	3.5	5.3	4.2	1,798.31
Migori	Migori	4.9	6.4	5.3	3,387.01
Lamu	Lamu	4.3	6.3	4.7	5,263.86
Bungoma	Webuye	6.2	7.1	6.6	4,070.67
Butere-Mumi	Mumias	4.8	6.3	5.5	3,707.80

Source: Welfare Monitoring Survey II, 1994

Table A 4-8: NAROK Institutional Development Costs

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	52,800,000
4	(a) Identify water supply and sewerage infrastructure and estimate cost	Standard infrastructural valuation procedures	2,500,000
	(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	3,163,328
Sub -total			**61,263,328**
Contingency (10%)			**6,126,333**
Total			**67,389,661**

Table A 4-9: Financing Plan - NAROK TOWN WATER SUPPLY

	1	2	3	4	Total
	Kshs	Kshs	Kshs	Kshs	Kshs
Institutional Development Costs	23,829,661	14,520,000	14,520,000	14,520,000	67,389,661
Consultancy Fees for Works (20% of works)	7,004,880	11,674,800	4,669,920	-	23,349,600
Water Supply Rehabilitation	35,024,400	58,374,000	23,349,600		116,748,000
Sanitation Rehabilitation	-	-	-	-	-
Total Overall Project Cost	**65,858,941**	**84,568,800**	**42,539,520**	**14,520,000**	**207,487,261**

Table A 4-9: Economic Investment Costs - NAROK TOWN WATER SUPPLY

	1	2	3	4	Total
	Kshs	Kshs	Kshs	Kshs	Kshs
Institutional Development Costs	23,829,661	14,520,000	14,520,000	14,520,000	67,389,661
Household costs	2,797,500				2,797,500
Consultancy Fees for Works (20% of works)	7,004,880	11,674,800	4,669,920	-	23,349,600
Water Supply Rehabilitation	35,024,400	58,374,000	23,349,600	-	116,748,000
Sanitation Rehabilitation	-	-	-	-	-
Total Overall Project Cost	**68,656,441**	**84,568,800**	**42,539,520**	**14,520,000**	**210,284,761**

Table A 4-11: Financial Sensitivity Analysis - Increase Project Life to 15 years

Financial Cash Flow for NAROK Town Water Supply

Year	Investment Cost	O&M Cost	Total Cost	Water Revenue	Net Revenue
1	65,858,941	1,423,283	67,282,224	5,755,685	(61,526,539)
2	84,568,800	9,188,889	93,757,689	22,253,679	(71,504,010)
3	42,539,520	10,230,220	52,769,740	24,465,983	(28,303,757)
4	14,520,000	10,230,220	24,750,220	24,465,983	(284,237)
5		10,230,220	10,230,220	24,465,983	14,235,763
6	-	10,230,220	10,230,220	24,465,983	14,235,763
7	-	10,230,220	10,230,220	24,465,983	14,235,763
8	-	10,874,491	10,874,491	25,834,733	14,960,242
9	-	10,874,491	10,874,491	25,834,733	14,960,242
10	-	10,874,491	10,874,491	25,834,733	14,960,242
11	-	10,874,491	10,874,491	25,834,733	14,960,242
12	-	10,874,491	10,874,491	25,834,733	14,960,242
13	-	10,874,491	10,874,491	25,834,733	14,960,242
14	-	10,874,491	10,874,491	25,834,733	14,960,242
15	-	10,874,491	10,874,491	25,834,733	14,960,242
Total	207,487,261	148,759,202	356,246,463	357,017,148	770,685

Average Tariff Rate (Ksh/m3)	**30**

FIRR		**0%**
NPV		**(40,363,436)**
RER		**1.002**

Table A 4-12: Financial Sensitivity Analysis - Increase Project Life to 15 years + Investment Cost & O&M by 15%

Financial Cash Flow for NAROK Town Water Supply

Year	Investment Cost	O&M Cost	Total Cost	Water Revenue	Net Revenue
1	75,737,782	1,636,775	77,374,558	5,755,685	(71,618,873)
2	97,254,120	10,567,222	107,821,342	22,253,679	(85,567,663)
3	48,920,448	11,764,753	60,685,201	24,465,983	(36,219,218)
4	16,698,000	11,764,753	28,462,753	24,465,983	(3,996,770)
5		11,764,753	11,764,753	24,465,983	12,701,230
6	-	11,764,753	11,764,753	24,465,983	12,701,230
7	-	11,764,753	11,764,753	24,465,983	12,701,230
8	-	12,505,665	12,505,665	25,834,733	13,329,069
9	-	12,505,665	12,505,665	25,834,733	13,329,069
10	-	12,505,665	12,505,665	25,834,733	13,329,069
11	-	12,505,665	12,505,665	25,834,733	13,329,069
12	-	12,505,665	12,505,665	25,834,733	13,329,069
13	-	12,505,665	12,505,665	25,834,733	13,329,069
14	-	12,505,665	12,505,665	25,834,733	13,329,069
15	-	12,505,665	12,505,665	25,834,733	13,329,069
Total	238,610,350	171,073,082	409,683,433	357,017,148	(52,666,284)

Average Tariff Rate (Ksh/m3)	**30**

FIRR		**-4%**
NPV		**(85,266,330)**
RER		**0.871**

Table A 4-13: Financial Sensitivity Analysis - Finance by Grant

Financial Cash Flow for NAROK Town Water Supply

Year	Investment Cost	O&M Cost	Total Cost	Water Revenue	Net Revenue
1	65,858,941	1,423,283	67,282,224	5,755,685	(61,526,539)
2	84,568,800	9,188,889	93,757,689	22,253,679	(71,504,010)
3	42,539,520	10,230,220	52,769,740	24,465,983	(28,303,757)
4	14,520,000	10,230,220	24,750,220	24,465,983	(284,237)
5		10,230,220	10,230,220	24,465,983	14,235,763
6	-	10,230,220	10,230,220	24,465,983	14,235,763
7	-	10,230,220	10,230,220	24,465,983	14,235,763
8	-	10,874,491	10,874,491	25,834,733	14,960,242
9	-	10,874,491	10,874,491	25,834,733	14,960,242
10	-	10,874,491	10,874,491	25,834,733	14,960,242
11	-	10,874,491	10,874,491	25,834,733	14,960,242
12	-	10,874,491	10,874,491	25,834,733	14,960,242
13	-	10,874,491	10,874,491	25,834,733	14,960,242
14	-	10,874,491	10,874,491	25,834,733	14,960,242
15	-	10,874,491	10,874,491	25,834,733	14,960,242
Total	207,487,261	148,759,202	356,246,463	357,017,148	770,685

Average Tariff Rate (Ksh/m3)	**30**

FIRR		**0%**
NPV		**770,685**
RER		**1.002**

Table A 4-14: Economic Sensitivity Analysis - Increase Economic Investment Costs by 15%

Economic Cash Flow for NAROK Town Water Supply

Year	Economic InvestmentCost	O&M Cost	Total Cost	Economic Benefit	Net Revenue
1	78,954,907	1,423,283	80,378,190	44,261,126	(36,117,065)
2	97,254,120	9,188,889	106,443,009	47,803,635	(58,639,373)
3	48,920,448	10,230,220	59,150,668	51,346,145	(7,804,524)
4	16,698,000	10,230,220	26,928,220	55,057,345	28,129,125
5		10,230,220	10,230,220	58,937,237	48,707,016
6		10,230,220	10,230,220	62,985,819	52,755,599
7		10,230,220	10,230,220	67,203,092	56,972,872
8		10,874,491	10,874,491	71,757,747	60,883,256
9		10,874,491	10,874,491	76,312,402	65,437,911
10		10,874,491	10,874,491	81,204,439	70,329,948
Total	**241,827,475**	**94,386,747**	**336,214,222**	**616,868,988**	**280,654,765**

Current Tariff Rate (Ksh/m3)	**30**

EIRR		**28%**
NPV		**191,160,190**
CBR		**0.545**

Table A 4-15: Economic Sensitivity Analysis - Increase O&M Costs by 15%

Economic Cash Flow for NAROK Town Water Supply

Year	Economic InvestmentCost	O&M Cost	Total Cost	Economic Benefit	Net Revenue
1	68,656,441	1,636,775	70,293,217	44,261,126	(26,032,091)
2	84,568,800	10,567,222	95,136,022	47,803,635	(47,332,387)
3	42,539,520	11,764,753	54,304,273	51,346,145	(2,958,129)
4	14,520,000	11,764,753	26,284,753	55,057,345	28,772,592
5		11,764,753	11,764,753	58,937,237	47,172,483
6		11,764,753	11,764,753	62,985,819	51,221,065
7		11,764,753	11,764,753	67,203,092	55,438,339
8		12,505,665	12,505,665	71,757,747	59,252,083
9		12,505,665	12,505,665	76,312,402	63,806,738
10		12,505,665	12,505,665	81,204,439	68,698,775
Total	**210,284,761**	**108,544,759**	**318,829,520**	**616,868,988**	**298,039,468**

Current Tariff Rate (Ksh/m3)	**30**

EIRR		**36%**
NPV		**209,089,648**
CBR		**0.517**

Table A 4-16: Economic Sensitivity Analysis - Increase Economic Investment Costs and O& M by 15%

Economic Cash Flow for NAROK Town Water Supply

Year	Economic InvestmentCost	O&M Cost	Total Cost	Economic Benefit	Net Revenue
2001	78,954,907	1,636,775	80,591,683	44,261,126	(36,330,557)
2002	97,254,120	10,567,222	107,821,342	47,803,635	(60,017,707)
2003	48,920,448	11,764,753	60,685,201	51,346,145	(9,339,057)
2004	16,698,000	11,764,753	28,462,753	55,057,345	26,594,592
2005		11,764,753	11,764,753	58,937,237	47,172,483
2006		11,764,753	11,764,753	62,985,819	51,221,065
2007		11,764,753	11,764,753	67,203,092	55,438,339
2008		12,505,665	12,505,665	71,757,747	59,252,083
2009		12,505,665	12,505,665	76,312,402	63,806,738
2010		12,505,665	12,505,665	81,204,439	68,698,775
Total	**241,827,475**	**108,544,759**	**350,372,234**	**616,868,988**	**266,496,753**

Current Tariff Rate (Ksh/m3)	**30**

EIRR		**27%**
NPV		**179,924,600**
CBR		**0.568**