Appendix 5.1 Urban Water Supply Schemes
Proposed Implementation Programme for Reduced Development (Alternative-A) (1/2)

District Code	Urban Name	City Code	Future Raw Water Source	Cost (million)		Implementation Schedule																	
				US$	K£	93		95					2000		2		4		6		8		10
110	Nairobi	U-1	Thika Dam, Ndarugu, Ruiru-A, Chania-B	577.6	727.8	●	●	●	●					●	●	●	●						
210	Karuri	U-2	Kiambaa Dam (Rui Ruaka R.)	9.1	11.4	●	●															●	●
210	Kiambu	U-3	Kiambaa Dam (Rui Ruaka r.)	6.5	8.2	●	●			●	●									●	●		
210	Ruiru	U-6	Ruiru River	6.5	8.2			●	●													●	●
210	Thika	U-7	Chania River (Lower)	10.4	13.1																	●	●
210	Kikuyu	U-9	Kikuyu Dam	12.7	16.0			●	●													●	●
220	Kerugoya	U-12	Kiringa River	5.0	6.3	●	●													●	●		
220	Kutus	U-13	Thiba River	2.8	3.5							●	●									●	●
230	Maragua	U-15	Githanji river	10.4	13.2	●	●															●	●
230	Murang'a	U-17	Maragua river	7.1	8.9	●	●													●	●		
230	Makuyu	U-18	Motoho river	3.1	3.9	●	●															●	●
240	Ol Kalou	U-19	Malewa River	6.8	8.5							●	●									●	●
250	Karatina	U-20	Ragati River	1.5	1.9																	●	●
250	Othaya	U-21	Tuthi river	3.0	3.8					●	●											●	●
250	Nyeri	U-22	Chania River	29.2	36.8			●	●									●	●				
310	Mariakani	U-23	2nd Mzima P/L	2.9	3.6			●	●													●	●
310	Kilifi	U-24	Rare reservoir	4.5	5.7															●	●		
310	Malindi	U-26	Sabaki Pipeline & Rare Dam	48.9	61.6							●	●									●	●
320	Kwale	U-27	Marere pipeline	2.9	3.7							●	●							●	●		
320	Msambweni	U-29	Boreholes + Mkurumuji river	26.7	33.7					●	●	●	●			●	●	●	●				
330	Lamu	U-31	P/L from Tana River + B/H	23.9	30.1					●	●									●	●		
340	Mombasa	U-32	2nd Mzima/Mwachi Dam, Pemba Dam	324.8	409.2	●	●	●	●					●	●	●	●						
350	Taveta	U-137	Njoro Spring	5.0	6.3			●	●													●	●
350	Voi	U-33	2nd Mzim pipeline	4.9	6.1							●	●									●	●
360	Hola	U-36	Tana River	4.2	5.3					●	●									●	●		
410	Embu	U-40	Lower Kapingazi River + Upper Rupingazi River	4.2	5.4															●	●		
420	Isiolo	U-41	Boreholes + Spring	72.4	91.3					●	●	●	●	●	●	●	●	●	●	●	●	●	●
420	Ol Doinyo Ng'iro	U-42	Ewaso Ngiro River	5.2	6.6	●	●															●	●
420	Merti	U-139	Ewaso Ngiro	3.4	4.3			●	●													●	●
430	Kitui	U-43	Masinga Dam	5.6	7.0	●	●													●	●		
430	Mwingi	U-45	Kiambere Dam	10.2	12.9	●	●															●	●
440	Machakos	U-46	Athi River P/L	47.4	59.7			●	●									●	●				
440	Mitaboni	U-47	Kaathana River	12.5	15.8	●	●															●	●
440	Athi River	U-48	Upper Athi Dam	12.6	15.8							●	●									●	●
440	Kangundo	U-50	Pipeline from Athi River	12.1	15.6	●	●															●	●
440	Wote	U-141	Kaiti river + Nzuuni river	2.0	2.5					●	●											●	●
450	Kargi	U-54	Boreholes + Subsurface Dam	38.2	48.1			●	●	●	●	●	●					●	●	●	●	●	●
450	Korr	U-143	Boreholes	33.4	42.1					●	●	●	●					●	●	●	●		
450	Marsabit	U-55	Boreholes +Small dams/Sub-surface dam/Spring	101.8	128.2			●	●	●	●	●	●	●	●	●	●	●	●	●	●		
450	Moyale	U-57	Boreholes + Small Dam	38.5	48.5					●	●	●	●					●	●	●	●		
460	Meru	U-58	Kathita river	26.1	32.8			●	●											●	●		
460	Nkubu	U-59	Thingithu River	2.8	3.5							●	●									●	●
510	Garissa	U-67	Tana River	6.6	8.3															●	●		
520	Mandera	U-68	Daua River	1.4	1.8															●	●		
520	Elwak	U-69	Borehores	50.7	63.9			●	●									●	●	●	●		
530	Wajir	U-71	Boreholes + Ewaso Ngiro River	104.7	131.9			●	●	●	●	●	●	●	●	●	●	●	●	●	●		
530	Buna	U-72	Boreholes(Lago Bor river)	62.5	78.7			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
610	Nyamira + Kebirigo	U-144	Kuja river	7.6	9.6					●	●											●	●
610	Kisii	U-76	Bunyunyu Dam	19.2	24.2					●	●	●	●							●	●		
620	Maseno	U-78	Edzawa Dam	10.1	12.8					●	●											●	●
620	Kisumu & + Kiboswa	U-79	Kibos dam	72.7	91.6			●	●									●	●				

Note: ● Construction

Appendix 5.1 Urban Water Supply Schemes
Proposed Implementation Programme for Reduced Development (Alternative-A) (2/2)

District Code	Urban Name	City Code	Future Raw Water Source	Cost (million)		Implementation Schedule
				US$	K£	93 95 2000 2 4 6 8 10
620	Ahero	U-80	Nyando river	4.0	5.0	● ●
620	Muhoroni	U-81	Nyando River	4.9	6.1	● ●
630	Siaya	U-83	Yala River	10.3	13.0	● ●
640	Homa Bay	U-85	Lake Victoria	8.1	10.2	● ●
640	Migori	U-86	Migori river	3.6	4.5	● ●
710	Oloitokitok	U-88	Nol-Turesh Spring	4.0	5.1	● ●
710	Ngong	U-89	Kerarapon Spring	8.4	10.5	● ●
710	Kajiado	U-90	Kiserian P/L	12.0	15.1	● ●
710	Namanga	U-91	Namanga Spring	3.2	4.0	● ●
720	Sotik	U-93	Kipsonoi river	3.0	3.8	● ●
720	Kericho	U-94	Dimlitch Dam, Kimugung Dam	15.2	19.1	● ●
730	Nanyuki	U-97	Liki river	10.4	13.1	● ●
730	Nyahururu	U-98	Nyahururu dam + Borehole	13.4	16.9	● ●
740	Gilgil	U-99	Turasha P/L & Malewa Dam	6.3	8.0	● ●
740	Naivasha	U-100	Turasha P/L & Malewa Dam	21.5	27.1	● ●
740	Elburgon	U-102	Itare Dam	16.3	20.6	● ● ● ●
740	Molo	U-103	Itare Dam	13.3	16.8	● ● ● ●
740	Nakuru	U-104	Turasha P/L + Malewa Dam + Itare Dam	121.0	152.5	● ● ● ●
750	Narok	U-105	Upper Narok Dam	22.8	28.7	● ●
760	Kitale	U-107	Koitobos river	19.6	24.7	● ●
770	Eldoret	U-110	Moiben Dam + Nzoia river	80.7	101.6	● ● ● ●
810	Kabarnet	U-112	Kirandich Dam	24.2	30.5	● ● ● ●
810	Maji Mazuri	U-113	Maji Mazuri river	3.2	4.0	● ●
810	Eldama Ravine	U-114	Chemususu Dam	21.8	27.5	● ●
820	Iten+Tambach	U-116	Moiben Dam	8.5	10.7	● ● ● ●
830	Kapsabet+Baraton	U-118	Mokong river	7.1	8.9	● ●
840	Maralal	U-119	Loikas/Yamo river	9.5	12.0	● ●
850	Lodwar	U-122	Boreholes & sub-surface dam	65.5	82.5	● ● ● ● ● ● ● ● ● ● ● ● ● ●
860	Kapenguria/Makutano	U-123	Kapenguria River	5.3	6.7	● ● ● ●
910	Bungoma	U-124	Kuywa River	15.9	20.0	● ● ● ●
910	Kimilili	U-125	Kimilili River	4.4	5.6	● ● ● ●
910	Webuye	U-126	Nzoia River	11.8	14.9	● ● ● ●
920	Busia	U-127	Sio river	8.1	10.2	● ● ● ●
930	Vihiga+Majengo	U-129	Edzawa River (Kimondi River)	3.4	4.3	● ● ● ●
930	Kakamega	U-132	Isiukhu River, Mukulusi Dam	18.5	23.3	● ● ● ●
930	Mumias	U-134	Nzoia River	9.0	11.4	● ● ● ●
				2,522.9	3,178.9	

Note: ● Construction

Appendix 5.2 Sewerage Development - Proposed Implementation Programme for Reduced Development (Alternative A) (1/2)

District Code	Urban Name	City Code	Future Raw Water Source	Cost (million)		Implementation Schedule																	
				US$	K£	93		95					2000		2		4		6		8		10
110	Nairobi	U-1	Thika Dam, Ndarugu, Ruiru-A, Chania-B	140.77	177.37	●	●	●	●					●	●	●	●						
210	Karuri	U-2	Kiambaa Dam (Rui Ruaka R.)	1.08	1.36			●	●													●	●
210	Kiambu	U-3	Kiambaa Dam (Rui Ruaka r.)	0.36	0.45							●	●							●	●		
210	Ruiru	U-6	Ruiru River	0.94	1.19					●	●											●	●
210	Thika	U-7	Chania River (Lower)	8.96	11.29							●	●									●	●
210	Kikuyu	U-9	Kikuyu Dam	0.48	0.61			●	●													●	●
220	Kerugoya	U-12	Kiringa River	0.71	0.89	●	●													●	●		
220	Kutus	U-13	Thiba River	0.49	0.62							●	●									●	●
230	Maragua	U-15	Githanji river	2.17	2.73			●	●													●	●
230	Murang'a	U-17	Maragua river	1.54	1.94	●	●											●	●				
230	Makuyu	U-18	Motoho river	0.37	0.46			●	●													●	●
240	Ol Kalou	U-19	Malewa River	0.86	1.08							●	●									●	●
250	Karatina	U-20	Ragati River	0.42	0.53							●	●									●	●
250	Othaya	U-21	Tuthi river	0.37	0.47							●	●									●	●
250	Nyeri	U-22	Chania River	14.12	17.79					●	●							●	●				
310	Mariakani	U-23	2nd Mzima P/L	0.52	0.65					●	●											●	●
310	Kilifi	U-24	Rare reservoir	1.31	1.65							●	●									●	●
310	Malindi	U-26	Sabaki Pipeline & Rare Dam	3.14	3.96							●	●									●	●
320	Kwale	U-27	Marere pipeline	0.33	0.42							●	●							●	●		
320	Msambweni	U-29	Boreholes + Mkurumuji river	0.75	0.95					●	●	●	●			●	●	●	●				
330	Lamu	U-31	P/L from Tana River + B/H	0.71	0.89							●	●							●	●		
340	Mombasa	U-32	2nd Mzima/Mwachi Dam, Pemba Dam	42.51	53.57	●	●	●	●					●	●	●	●						
350	Taveta	U-137	Njoro Spring	0.71	0.89					●	●											●	●
350	Voi	U-33	2nd Mzim pipeline	0.81	1.02							●	●									●	●
350	Wundanyi	U-34	Sigaso/Manguri River	0.18	0.23							●	●									●	●
360	Hola	U-36	Tana River	0.76	0.96							●	●							●	●		
410	Embu	U-40	Lower Kapingazi River + Upper Rupingazi River	1.51	1.90							●	●							●	●		
420	Isiolo	U-41	Boreholes + Spring	1.84	2.32					●	●	●	●	●	●	●	●	●	●	●	●	●	●
420	Ol Doinyo Ng'iro	U-42	Ewaso Ngiro River	0.42	0.53			●	●													●	●
420	Merti	U-139	Ewaso Ngiro	0.54	0.68					●	●											●	●
430	Kitui	U-43	Masinga Dam	0.84	1.05	●	●													●	●		
430	Mwingi	U-45	Kiambere Dam	0.66	0.83	●	●															●	●
440	Machakos	U-46	Athi River P/L	13.87	17.47					●	●							●	●				
440	Mitaboni	U-47	Kaathana River	2.32	2.92			●	●													●	●
440	Athi River	U-48	Upper Athi Dam	2.00	2.52							●	●									●	●
440	Kangundo	U-50	Pipeline from Athi River	0.90	1.14			●	●													●	●
440	Wote	U-141	Kaiti river + Nzuuni river	0.19	0.24							●	●									●	●
450	Kargi	U-54	Boreholes + Subsurface Dam	0.39	0.50			●	●	●	●	●	●					●	●	●	●	●	●
450	Korr	U-143	Boreholes	0.45	0.56					●	●	●	●			●	●	●	●				
450	Marsabit	U-55	Boreholes +Small dams/Sub-surface dam/Spring	1.01	1.27			●	●	●	●	●	●	●	●	●	●	●	●	●	●		
450	Moyale	U-57	Boreholes + Small Dam	0.62	0.78					●	●	●	●					●	●	●	●		
460	Meru	U-58	Kathita river	12.58	15.85					●	●									●	●		
460	Nkubu	U-59	Thingithu River	0.42	0.53							●	●									●	●
510	Garissa	U-67	Tana River	2.59	3.26							●	●							●	●		
520	Mandera	U-68	Daua River	0.43	0.54							●	●							●	●		
520	Elwak	U-69	Borehores	0.62	0.78					●	●							●	●	●	●		
530	Wajir	U-71	Boreholes + Ewaso Ngiro River	1.62	2.04			●	●	●	●	●	●	●	●	●	●	●	●	●	●		
530	Buna	U-72	Boreholes(Lago Bor river)	0.45	0.56			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
610	Nyamira + Kebirigo	U-144	Kuja river	0.73	0.92							●	●									●	●
610	Kisii	U-76	Bunyunyu Dam	3.06	3.85							●	●							●	●		
620	Maseno	U-78	Edzawa Dam	1.10	1.39							●	●									●	●

Note: ● Construction

Appendix 5.2 Sewerage Development - Proposed Implementation Programme for Reduced Development (Alternative A) (2/2)

District Code	Urban Name	City Code	Future Raw Water Source	Cost (million)		Implementation Schedule
				US$	K£	93 95 2000 2 4 6 8 10
620	Kisumu & + Kiboswa	U-79	Kibos dam	23.13	29.14	
620	Ahero	U-80	Nyando river	0.64	0.80	
620	Muhoroni	U-81	Nyando River	0.57	0.72	
630	Siaya	U-83	Yala River	1.27	1.60	
640	Homa Bay	U-85	Lake Victoria	1.65	2.08	
640	Migori	U-86	Migori river	0.54	0.68	
710	Oloitokitok	U-88	Not-Turesh Spring	0.46	0.58	
710	Ngong	U-89	Kerarapon Spring	1.58	1.98	
710	Kajiado	U-90	Kiscrian P/L	0.64	0.80	
710	Namanga	U-91	Namanga Spring	0.51	0.65	
720	Sotik	U-93	Kipsonoi river	0.39	0.49	
720	Kericho	U-94	Dimlitch Dam, Kimugung Dam	3.00	3.78	
730	Nanyuki	U-97	Liki river	2.20	2.77	
730	Nyahururu	U-98	Nyahururu dam + Borehole	1.26	1.58	
740	Gilgil	U-99	Turasha P/L. & Malewa Dam	1.37	1.73	
740	Naivasha	U-100	Turasha P/L & Malewa Dam	7.07	8.91	
740	Elburgon	U-102	Itare Dam	1.17	1.47	
740	Molo	U-103	Itare Dam	1.03	1.29	
740	Nakuru	U-104	Turasha P/L. + Malewa Dam + Itare Dam	30.09	37.91	
750	Narok	U-105	Upper Narok Dam	1.51	1.91	
760	Kitale	U-107	Koitobos river	9.43	11.88	
770	Eldoret	U-110	Moiben Dam + Nzoia river	17.50	22.05	
810	Kabarnet	U-112	Kirandich Dam	0.71	0.89	
810	Maji Mazuri	U-113	Maji Mazuri river	0.39	0.50	
810	Eldama Ravine	U-114	Chemususu Dam	0.43	0.54	
820	Iten+Tambach	U-116	Moiben Dam	0.45	0.57	
830	Kapsabet+Baraton	U-118	Mokong river	1.14	1.43	
840	Maralal	U-119	Loikas/Yamo river	1.50	1.89	
850	Lodwar	U-122	Boreholes & sub-surface dam	0.81	1.02	
860	Kapenguria/Makutano	U-123	Kapenguria River	0.96	1.21	
910	Bungoma	U-124	Kuywa River	2.80	3.52	
910	Kimilili	U-125	Kimilili River	0.63	0.79	
910	Webuye	U-126	Nzoia River	2.53	3.18	
920	Busia	U-127	Sio river	1.41	1.78	
930	Vihiga+Majengo	U-129	Edzawa River (Kimondi River)	0.34	0.43	
930	Kakamega	U-132	Isiukhu River, Mukulusi Dam	7.76	9.78	
930	Mumias	U-134	Nzoia River	1.76	2.21	
				407.11	512.96	

Note: ● Construction

Appendix 5.3 Summary of Development Cost for Reduced Development (Alternative-A)

Development Sector	Budget Appropriated for	Financial Requirement (Million)					
		1993 - 2000		2001 - 2010		Total	
		US$	K£	US$	K£	US$	K£
1. D&I Water Supply		1,904	2,399	1,933	2,436	3,837	4,835
(1) Urban water supply	MOWD *1	1,247	1,571	1,276	1,608	2,523	3,179
(2) Rural water supply	MOWD *2	657	828	657	828	1,314	1,656
2. Sewerage Development	MOLG *3	203	256	204	257	407	513
Total		2,107	2,655	2,137	2,693	4,244	5,348

Notes: Executing agencies will be;
*1 : MOWD, NWCPC, Municipalities (NCC, etc)
*2 : MOWD, NWCPC, County councils, NGO, etc
*3 : Municipal and urban councils under technical assistance by MOWD

Appendix 5.4 Annual Budgetary Schedule for Reduced Development (Alternative-A)

(Unit : million US$)

Development Sector	Year																		Total
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
1 D&I Water Supply	336.2	336.2	257.4	257.4	170.9	170.9	187.3	187.3	190.6	190.6	195.5	195.5	213.9	213.9	204.1	204.1	162.5	162.5	3,837
(1) Urban water supply	254.1	254.1	175.3	175.3	88.8	88.8	105.2	105.2	125.0	125.0	129.8	129.8	148.2	148.2	138.4	138.4	96.8	96.8	2,523
(2) Rural water supply	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1	65.7	65.7	65.7	65.7	65.7	65.7	65.7	65.7	65.7	65.7	1,314
2 Sewerage Development (for 158 urban centres)	30.6	30.6	31.7	31.7	22.5	22.5	16.9	16.9	16.7	16.7	16.8	16.8	32.1	32.1	21.3	21.3	14.8	14.8	407
Total	366.9	366.9	289.1	289.1	193.4	193.4	204.2	204.2	207.3	207.3	212.3	212.3	246.0	246.0	225.4	225.4	177.3	177.3	4,244

Appendix 5.5 Urban Water Supply Schemes (1/3)
Proposed Implementation Programme for Reduced Development (Alternative-B)

District Code	Urban Name	City Code	Future Raw Water Source	Cost (million)		Implementation Schedule
				US$	K£	93 95 2000 2 4 6 8 10
110	Nairobi	U-1	Thika Dam, Ndarugu, Ruiru-A, Chania-B	1,061.6	1,337.7	● ● ● ● ● ● ● ● ● ●
210	*Karuri*	U-2	*Kiambaa Dam (Rui Ruaka R.)*	9.1	11.4	● ● ● ●
210	Kiambu	U-3	Kiambaa Dam (Rui Ruaka r.)	6.5	8.2	● ● ● ● ● ● ● ●
210	Limuru	U-5	Chania P/L	9.2	11.6	● ● ● ●
210	Ruiru	U-6	Ruiru River	6.5	8.2	● ● ● ●
210	Thika	U-7	Chania River (Lower)	10.4	13.1	● ●
210	Githunguri	U-8	Ruiru river	3.2	4.0	● ● ● ●
210	Kikuyu	U-9	Kikuyu Dam	12.7	16.0	● ● ● ●
220	Wanguru	U-10	Thiba River	0.6	0.7	● ●
220	Sagana	U-11	Ragati River	2.2	2.7	● ● ● ●
220	Kerugoya	U-12	Kiringa River	5.0	6.3	● ● ● ● ● ●
220	Kutus	U-13	Thiba River	2.8	3.5	● ● ● ●
230	Maragua	U-15	Githanji river	10.4	13.2	● ● ● ●
230	Kangema	U-16	Mathioya River	0.5	0.7	● ●
230	*Murang'a*	U-17	*Maragua river*	7.1	8.9	● ● ● ● ● ●
230	Makuyu	U-18	Motoho river	3.1	3.9	● ● ● ● ● ●
240	Ol Kalou	U-19	Mafewa River	6.8	8.5	● ● ● ●
250	Karatina	U-20	Ragati River	1.5	1.9	● ● ● ●
250	Othaya	U-21	Tuthi river	3.0	3.8	● ● ● ● ● ●
250	Nyeri	U-22	Chania River	29.2	36.8	● ● ● ● ● ● ● ●
310	Mariakani	U-23	2nd Mzima P/L	2.9	3.6	● ● ● ● ● ●
310	Kilifi	U-24	Rare reservoir	4.5	5.7	● ● ● ●
310	Watamu	U-25	Sabaki pipeline	3.3	4.2	● ● ● ● ● ●
310	Malindi	U-26	Sabaki Pipeline & Rare Dam	64.4	81.1	● ● ● ● ● ●
310	Mambrui	U-135	Sabaki river	2.5	3.2	● ● ● ● ● ●
320	Kwale	U-27	Marere pipeline	2.9	3.7	● ● ● ● ● ●
320	Kinango	U-28	Marere pipeline	3.1	4.0	● ● ● ● ● ●
320	*Msambweni*	U-29	Boreholes + *Mkurumuji river*	26.7	33.7	● ● ● ● ● ● ● ● ● ● ● ●
320	Lungalunga	U-136	Umba river	1.5	1.9	● ● ● ● ● ●
330	Witu	U-30	*Mkondo wa Cambi river*	3.3	4.2	● ● ● ● ● ●
330	Lamu	U-31	P/L from Tana River + B/H	37.5	47.3	● ● ● ● ● ●
340	Mombasa	U-32	2nd Mzima/Mwachi Dam, Pemba Dam	441.6	556.4	● ● ● ● ● ● ● ● ● ●
350	Taveta	U-137	Njoro Spring	5.0	6.3	● ● ● ● ● ●
350	Voi	U-33	2nd Mzim pipeline	4.9	6.1	● ● ● ● ● ●
360	Bura & Madogo	U-35	Tana River	0.6	0.8	● ● ● ● ● ●
360	Hola	U-36	Tana River	4.2	5.3	● ● ● ● ● ●
360	Garsen	U-37	Tana River	2.0	2.5	● ● ● ● ● ●
410	Runyenjes	U-38	Ena river	1.5	1.9	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●
410	Embu	U-40	Lower Kapingazi River + Upper Rupingazi River	4.2	5.4	● ● ● ●
420	Isiolo	U-41	Boreholes + Spring	72.4	91.3	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●
420	Ol Doinyo Ng'iro	U-42	Ewaso Ngiro River	5.2	6.6	● ● ● ● ● ●
420	Garbatula	U-138	Boreholes	21.1	26.6	● ● ● ● ● ● ● ● ● ●
420	*Merti*	U-139	*Ewaso Ngiro*	3.4	4.3	● ● ● ● ● ●
430	Kitui	U-43	Masinga Dam	5.6	7.0	● ● ● ● ● ●
430	Mwingi	U-45	Kiambere Dam	10.2	12.9	● ● ● ● ● ●
440	Machakos	U-46	Athi River P/L	47.4	59.7	● ● ● ● ● ●
440	Mitaboni	U-47	Kaathana River	12.5	15.8	● ● ● ● ● ●
440	Athi River	U-48	Upper Athi Dam	12.6	15.8	● ● ● ● ● ●
440	Uaani/Tawa	U-49	Tawa river	0.8	1.0	● ● ● ● ● ●
440	Kangundo	U-50	Pipeline from Athi River	12.4	15.6	● ● ● ● ● ●
440	Tala	U-140	Pipeline from Athi river	5.6	7.1	● ● ● ● ● ●

Note: ● Construction

Appendix 5.5 Urban Water Supply Schemes (2/3)
Proposed Implementation Programme for Reduced Development (Alternative-B)

District Code	Urban Name	City Code	Future Raw Water Source	Cost (million)		Implementation Schedule
				US$	K£	93 95 2000 2 4 6 8 10
440	Nunguni	U-51	Kyangonyo river	1.0	1.3	
440	Wote	U-141	Kaiti river + Nzuuni river	2.0	2.5	
440	Emali	U-52	Nol Tresh P/L	1.2	1.5	
440	Mtito Andei&Kibwezi	U-53	Pipeline from Athi river	12.8	16.1	
450	North Horr	U-142	Boreholes	13.9	17.5	
450	Kargi	U-54	Boreholes + Subsurface Dam	38.2	48.1	
450	Korr	U-143	Boreholes	33.4	42.1	
450	Marsabit	U-55	Boreholes +Small dams/Sub-surface dam/Spring	177.7	223.9	
450	Sololo	U-56	Boreholes	36.6	46.1	
450	Moyale	U-57	Boreholes + Small Dam	38.5	48.5	
460	Meru	U-58	Kathita river	26.1	32.8	
460	Nkubu	U-59	Thingithu River	2.8	3.5	
460	Chogoria	U-60	North Mara River	1.3	1.6	
460	Chuka	U-61	Tungu river	2.6	3.3	
460	Maua	U-62	Ura river	2.5	3.2	
510	Mudo Gashe	U-63	Boreholes + Subsurface Dam	12.9	16.3	
510	Ijara	U-64	Boreholes + Small dam	8.0	10.1	
510	Kotile	U-65	Boreholes/Subsurface Dam/Tana	11.7	14.8	
510	Masalani	U-66	Tana River	1.7	2.1	
510	Garissa	U-67	Tana River	6.6	8.3	
520	Mandera	U-68	Daua River	1.4	1.8	
520	Elwak	U-69	Borehores	50.7	63.9	
520	Rhamu	U-70	Daua River	1.8	2.3	
530	Wajir	U-71	Boreholes + Ewaso Ngiro River	104.7	131.9	
530	Buna	U-72	Boreholes(Lago Bor river)	62.5	78.7	
530	Bute	U-73	Boreholes + Small Dams	12.0	15.2	
610	Manga	U-74	Bunyunyu Dam	2.0	2.6	
610	Keroka	U-75	Bunyunyu Dam	3.6	4.6	
610	Nyamira + Kebirigo	U-144	Kuja river	7.6	9.6	
610	Kisii	U-76	Bunyunyu Dam	19.2	24.2	
610	Ogembo	U-77	Kuja river	1.2	1.5	
620	Maseno	U-78	Edzawa Dam	10.1	12.8	
620	Kisumu & + Kiboswa	U-79	Kibos dam	104.8	132.1	
620	Ahero	U-80	Nyando river	4.0	5.0	
620	Muhoroni	U-81	Nyando River	4.9	6.1	
630	Bondo	U-145	Yala river	2.8	3.5	
630	Yala	U-82	Yala river	1.7	2.1	
630	Siaya	U-83	Yala River	10.3	13.0	
630	Ukwala	U-84	Nzoia River	1.3	1.6	
640	Homa Bay	U-85	Lake Victoria	8.1	10.2	
640	Migori	U-86	Migori river	3.6	4.5	
640	Kehancha + Tarang'anya	U-146	Migori river	3.3	4.1	
640	Nyabikaye	U-147	Boreholes	18.9	23.8	
640	Oyugis	U-148	Isanta river(Awach Tende)	3.4	4.3	
640	Kendu Bay	U-87	Lake Victoria	1.9	2.5	
640	Awendo/Sare	U-149	Sare river	3.6	4.6	
710	Oloitokitok	U-88	Nol-Turesh Spring	4.0	5.1	
710	Ngong	U-89	Kerarapon Spring	8.4	10.5	
710	Kajiado	U-90	Kiserian P/L	12.0	15.1	
710	Namanga	U-91	Namanga Spring	3.2	4.0	
710	Magadi	U-92	Oloibortoto river	6.4	8.0	
720	Sotik	U-93	Kipsonoi river	3.0	3.8	

Note: ● Construction

Appendix 5.5 Urban Water Supply Schemes (3/3)
Proposed Implementation Programme for Reduced Development (Alternative-B)

District Code	Urban Name	City Code	Future Raw Water Source	Cost (million)		Implementation Schedule
				US$	K£	93 95 2000 2 4 6 8 10
720	Kericho	U-94	Dimlitch Dam, Kimugung Dam	24.2	30.5	
720	Kipkelion	U-95	Nyando river	1.3	1.6	
720	Londiani	U-96	Londiani dam	57.1	72.0	
730	Nanyuki	U-97	Liki river	10.4	13.1	
730	Rumuruti	U-150	Rumuruti Dam + Borehole	7.3	9.2	
730	Nyahururu	U-98	Nyahururu dam + Borehole	13.4	16.9	
740	Gilgil	U-99	Turasha P/L & Malewa Dam	6.3	8.0	
740	Naivasha	U-100	Turasha P/L & Malewa Dam	21.5	27.1	
740	Njoro	U-101	Itare Dam	16.9	21.3	
740	Elburgon	U-102	Itare Dam	16.3	20.6	
740	Molo	U-103	Itare Dam	13.3	16.8	
740	Nakuru	U-104	Turasha P/L + Malewa Dam + Itare Dam	212.0	267.1	
750	Narok	U-105	Upper Narok Dam	22.8	28.7	
750	Nairagie Ngare	U-106	Nasampolai river	1.1	1.3	
750	Kilgoris	U-151	Poroko river	2.6	3.3	
750	Lolkorian	U-152	Migori river	2.3	2.9	
760	Kitale	U-107	Koitobos river	19.6	24.7	
760	Kiminini/Saboti+Spr.Kita	U-108	Kabewyan river	2.1	2.7	
760	Endebess/Kwanza	U-109	Koitobos river	1.7	2.1	
770	Moi's Bridge	U-153	Nzoia river	1.9	2.4	
770	Turbo	U-154	Sosiani river	3.5	4.4	
770	Eldoret	U-110	Moiben Dam + Nzoia river	80.7	101.6	
770	Burnt Forest	U-111	Kipkaren river	1.3	1.6	
810	Kabarnet	U-112	Kirandich Dam	24.2	30.5	
810	Maji Mazuri	U-113	Maji Mazuri river	3.2	4.0	
810	Eldama Ravine	U-114	Chemususu Dam	21.8	27.5	
810	Mogotio	U-115	Molo river /Chemususu Dam	4.7	5.9	
810	Marigat	U-155	Perkerra river	1.6	2.1	
820	Iten+Tambach	U-116	Moiben Dam	8.5	10.7	
830	Nandi Hills	U-117	Mokong River	2.7	3.3	
830	Kapsabet+Baraton	U-118	Mokong river	7.1	8.9	
840	Maralal	U-119	Loikas/Yamo river	9.5	12.0	
840	Wamba	U-120	Boreholes	43.1	54.3	
840	Baragoi	U-121	Boreholes + Sub-surface dam	66.5	83.8	
850	Lodwar	U-122	Boreholes & sub-surface dam	65.5	82.5	
860	Kapenguria/Makutano	U-123	Kapenguria River	5.3	6.7	
910	Mawalie + Malakisi	U-156	Malikisi river	2.2	2.8	
910	Bungoma	U-124	Kuywa River	15.9	20.0	
910	Kimilili	U-125	Kimilili River	4.4	5.6	
910	Webuye	U-126	Nzoia River	11.8	14.9	
910	Chaptais	U-157	Sasuri river	1.8	2.2	
920	Busia	U-127	Sio river	8.1	10.2	
920	Nambale	U-158	Sio river	1.4	1.8	
930	Vihiga+Majengo	U-129	Edzawa River (Kimondi River)	3.4	4.3	
930	Khayega	U-131	Yala river	1.2	1.5	
930	Kakamega	U-132	Isiukhu River, Mukulusi Dam	18.5	23.3	
930	Butere	U-133	Viratsi River	1.4	1.8	
930	Mumias	U-134	Nzoia River	9.0	11.4	
				3,818.1	4,810.8	

Note: ● Construction

Appendix 5.6 Sewerage Development - Proposed Implementation Programme for Reduced Development (Alternative-B) (1/3)

District Code	Urban Name	City Code	Future Raw Water Source	Cost (million)		Implementation Schedule
				US$	K£	93 95 2000 2 4 6 8 10
110	Nairobi	U-1	Thika Dam, Ndarugu, Ruiru-A, Chania-B	214.81	270.66	● ● ● ● ● ● ● ● ● ●
210	Karuri	U-2	Kiambaa Dam (Rui Ruaka R.)	1.08	1.36	● ● ● ●
210	Kiambu	U-3	Kiambaa Dam (Rui Ruaka r.)	0.36	0.45	● ● ● ●
210	Gatundu & Ngenda	U-4	Thiririka River	0.03	0.03	
210	Limuru	U-5	Chania P/L	0.11	0.14	● ● ● ●
210	Ruiru	U-6	Ruiru River	0.94	1.19	● ● ● ●
210	Thika	U-7	Chania River (Lower)	8.96	11.29	● ● ● ●
210	Githunguri	U-8	Ruiru river	0.30	0.38	● ● ● ●
210	Kikuyu	U-9	Kikuyu Dam	0.48	0.61	● ● ● ●
220	Wanguru	U-10	Thiba River	0.04	0.05	● ● ● ●
220	Sagana	U-11	Ragati River	0.23	0.29	● ● ● ●
220	Kerugoya	U-12	Kiringa River	0.71	0.89	● ● ● ● ● ●
220	Kutus	U-13	Thiba River	0.49	0.62	● ● ● ●
230	Kandara	U-14	Thika River	0.02	0.03	● ● ● ●
230	Maragua	U-15	Githanji river	2.17	2.73	● ● ● ●
230	Kangema	U-16	Mathioya River	0.10	0.12	● ● ● ●
230	Murang'a	U-17	Maragua river	1.54	1.94	● ● ● ● ● ●
230	Makuyu	U-18	Motoho river	0.37	0.46	● ● ● ●
240	Ol Kalou	U-19	Malewa River	0.86	1.08	● ● ● ●
250	Karatina	U-20	Ragati River	0.42	0.53	● ● ● ●
250	Othaya	U-21	Tuthi river	0.37	0.47	● ● ● ●
250	Nyeri	U-22	Chania River	14.12	17.79	● ● ● ● ● ●
310	Mariakani	U-23	2nd Mzima P/L	0.52	0.65	● ● ● ●
310	Kilifi	U-24	Rare reservoir	1.31	1.65	● ● ● ●
310	Watamu	U-25	Sabaki pipeline	0.19	0.23	● ● ● ●
310	Malindi	U-26	Sabaki Pipeline & Rare Dam	10.56	13.30	● ● ● ●
310	Mambrui	U-135	Sabaki river	0.24	0.30	● ● ● ●
320	Kwale	U-27	Marere pipeline	0.33	0.42	● ● ● ● ● ●
320	Kinango	U-28	Marere pipeline	0.15	0.19	● ● ● ●
320	Msambweni	U-29	Boreholes + Mkurumuji river	0.75	0.95	● ● ● ● ● ● ● ● ● ●
320	Lungalunga	U-136	Umba river	0.20	0.25	● ● ● ●
330	Witu	U-30	Mkondo wa Cambi river	0.26	0.33	● ● ● ●
330	Lamu	U-31	P/L from Tana River + B/H	1.19	1.50	● ● ● ● ● ●
340	Mombasa	U-32	2nd Mzima/Mwachi Dam, Pemba Dam	57.41	72.33	● ● ● ● ● ● ● ● ● ●
350	Taveta	U-137	Njoro Spring	0.71	0.89	● ● ● ●
350	Voi	U-33	2nd Mzim pipeline	0.81	1.02	● ● ● ●
350	Wundanyi	U-34	Sigaso/Manguri River	0.18	0.23	● ● ● ●
360	Bura & Madogo	U-35	Tana River	0.07	0.09	● ● ● ●
360	Hola	U-36	Tana River	0.76	0.96	● ● ● ● ● ●
360	Garsen	U-37	Tana River	0.28	0.36	● ● ● ●
410	Runyenjes	U-38	Ena river	0.14	0.18	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●
410	Siakago	U-39	Ena River	0.01	0.01	● ●
410	Embu	U-40	Lower Kapingazi River + Upper Rupingazi River	1.51	1.90	● ● ● ● ● ●
420	Isiolo	U-41	Boreholes + Spring	1.84	2.32	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●
420	Ol Doinyo Ng'iro	U-42	Ewaso Ngiro River	0.42	0.53	● ● ● ●
420	Garbatula	U-138	Boreholes	0.18	0.23	● ● ● ● ● ● ● ● ● ●
420	Merti	U-139	Ewaso Ngiro	0.54	0.68	● ● ● ●
430	Kitui	U-43	Masinga Dam	0.84	1.05	● ● ● ● ● ●
430	Mutomo	U-44	Sub-Surface dam on Tiva river	0.02	0.03	● ● ● ●
430	Mwingi	U-45	Kiambere Dam	0.66	0.83	● ● ● ●
440	Machakos	U-46	Athi River P/L	13.87	17.47	● ● ● ● ● ●
440	Mitaboni	U-47	Kaathana River	2.32	2.92	● ● ● ●
440	Athi River	U-48	Upper Athi Dam	2.00	2.52	● ● ● ●

Note: ● Construction

Appendix 5.6 Sewerage Development - Proposed Implementation Programme for Reduced Development (Alternative-B) (2/3)

District Code	Urban Name	City Code	Future Raw Water Source	Cost (million) US$	Cost (million) K£	93	94	95	96	97	98	99	2000	1	2	3	4	5	6	7	8	9	10
440	Uaani/Tawa	U-49	Tawa river	0.02	0.02			●	●													●	●
440	Kangundo	U-50	Pipeline from Athi River	0.90	1.14			●	●													●	●
440	Tala	U-140	Pipeline from Athi river	0.14	0.18			●	●													●	●
440	Nunguni	U-51	Kyangonyo river	0.03	0.03							●	●									●	●
440	Wote	U-141	Kaiti river + Nzuuni river	0.19	0.24							●	●									●	●
440	Emali	U-52	Nol Tresh P/L	0.02	0.03	●	●															●	●
440	Mtito Andei&Kibwezi	U-53	Pipeline from Athi river	0.29	0.37	●	●															●	●
450	North Horr	U-142	Boreholes	0.16	0.21			●	●									●	●	●	●		
450	Kargi	U-54	Boreholes + Subsurface Dam	0.39	0.50			●	●	●	●	●	●					●	●	●	●	●	●
450	Korr	U-143	Boreholes	0.45	0.56					●	●	●	●			●	●	●	●				
450	Marsabit	U-55	Boreholes +Small dams/Sub-surface dam/Spring	1.65	2.07			●	●	●	●	●	●	●	●	●	●	●	●	●	●		
450	Sololo	U-56	Boreholes	0.34	0.43			●	●	●	●	●	●					●	●	●	●		
450	Moyale	U-57	Boreholes + Small Dam	0.62	0.78					●	●	●	●					●	●	●	●		
460	Meru	U-58	Kathita river	12.58	15.85					●	●									●	●		
460	Nkubu	U-59	Thingithu River	0.42	0.53							●	●									●	●
460	Chogoria	U-60	North Mara River	0.08	0.10	●	●															●	●
460	Chuka	U-61	Tungu river	0.29	0.36							●	●									●	●
460	Maua	U-62	Ura river	0.29	0.36					●	●											●	●
510	Mudo Gashe	U-63	Boreholes + Subsurface Dam	0.17	0.21			●	●											●	●	●	●
510	Ijara	U-64	Boreholes + Small dam	0.09	0.11			●	●											●	●	●	●
510	Kotile	U-65	Boreholes/Subsurface Dam/Tana	0.09	0.11			●	●											●	●	●	●
510	Masalani	U-66	Tana River	0.09	0.11					●	●											●	●
510	Garissa	U-67	Tana River	2.59	3.26							●	●							●	●		
520	Mandera	U-68	Daua River	0.43	0.54							●	●							●	●		
520	Elwak	U-69	Borehores	0.62	0.78					●	●							●	●	●	●		
520	Rhamu	U-70	Daua River	0.26	0.33							●	●									●	●
530	Wajir	U-71	Boreholes + Ewaso Ngiro River	1.62	2.04			●	●	●	●	●	●	●	●	●	●	●	●	●	●		
530	Buna	U-72	Boreholes(Lago Bor river)	0.45	0.56			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
530	Bute	U-73	Boreholes + Small Dams	0.15	0.18			●	●											●	●	●	●
610	Manga	U-74	Bunyunyu Dam	0.06	0.07					●	●											●	●
610	Keroka	U-75	Bunyunyu Dam	0.15	0.19					●	●											●	●
610	Nyamira + Kebirigo	U-144	Kuja river	0.73	0.92							●	●									●	●
610	Kisii	U-76	Bunyunyu Dam	3.06	3.85							●	●							●	●		
610	Ogembo	U-77	Kuja river	0.07	0.09	●	●															●	●
620	Maseno	U-78	Edzawa Dam	1.10	1.39							●	●									●	●
620	Kisumu & + Kiboswa	U-79	Kibos dam	37.19	46.85			●	●									●	●				
620	Ahero	U-80	Nyando river	0.64	0.80			●	●													●	●
620	Muhoroni	U-81	Nyando River	0.57	0.72					●	●											●	●
630	Bondo	U-145	Yala river	0.21	0.26					●	●											●	●
630	Yala	U-82	Yala river	0.16	0.20					●	●											●	●
630	Siaya	U-83	Yala River	1.27	1.60							●	●							●	●		
630	Ukwala	U-84	Nzoia River	0.07	0.08					●	●											●	●
640	Homa Bay	U-85	Lake Victoria	1.65	2.08							●	●							●	●		
640	Migori	U-86	Migori river	0.54	0.68					●	●											●	●
640	Kehancha + Tarang'anya	U-146	Migori river	0.24	0.30	●	●															●	●
640	Nyabikaye	U-147	Boreholes	0.23	0.29			●	●											●	●	●	●
640	Oyugis	U-148	Isanta river(Awach Tende)	0.24	0.30					●	●											●	●
640	Kendu Bay	U-87	Lake Victoria	0.20	0.25					●	●											●	●
640	Awendo/Sare	U-149	Sare river	0.27	0.34	●	●															●	●
710	Oloitokitok	U-88	Nol-Turesh Spring	0.46	0.58							●	●									●	●
710	Ngong	U-89	Kerarapon Spring	1.58	1.98					●	●											●	●
710	Kajiado	U-90	Kiserian P/L	0.64	0.80					●	●									●	●		
710	Namanga	U-91	Namanga Spring	0.51	0.65					●	●											●	●

Note: ● Construction

Appendix 5.6 Sewerage Development - Proposed Implementation Programme for Reduced Development (Alternative-B) (3/3)

District Code	Urban Name	City Code	Future Raw Water Source	Cost (million)		Implementation Schedule
				US$	K£	93 95 2000 2 4 6 8 10
710	Magadi	U-92	Oloibortoto river	0.30	0.38	
720	Souk	U-93	Kipsonoi river	0.39	0.49	
720	Kericho	U-94	Dimlitch Dam, Kimugung Dam	9.72	12.24	
720	Kipkelion	U-95	Nyando river	0.17	0.21	
720	Londiani	U-96	Londiani dam	0.24	0.30	
730	Nanyuki	U-97	Liki river	2.20	2.77	
730	Rumuruti	U-150	Rumuruti Dam + Borehole	0.18	0.23	
730	Nyahururu	U-98	Nyahururu dam + Borehole	1.26	1.58	
740	Gilgil	U-99	Turasha P/L & Malewa Dam	1.37	1.73	
740	Naivasha	U-100	Turasha P/L & Malewa Dam	7.07	8.91	
740	Njoro	U-101	Itare Dam	0.86	1.08	
740	Elburgon	U-102	Itare Dam	1.17	1.47	
740	Molo	U-103	Itare Dam	1.03	1.29	
740	Nakuru	U-104	Turasha P/L + Malewa Dam + Itare Dam	55.47	69.89	
750	Narok	U-105	Upper Narok Dam	1.51	1.91	
750	Nairagie Ngare	U-106	Nasampolai river	0.05	0.06	
750	Kilgoris	U-151	Poroko river	0.33	0.42	
750	Lolkorian	U-152	Migori river	0.17	0.22	
760	Kitale	U-107	Koitobos river	9.43	11.88	
760	Kiminini/Saboti+Spr.Kita	U-108	Kabcwyan river	0.10	0.13	
760	Endebess/Kwanza	U-109	Koitobos river	0.17	0.21	
770	Moi's Bridge	U-153	Nzoia river	0.22	0.28	
770	Turbo	U-154	Sosiani river	0.30	0.38	
770	Eldoret	U-110	Moiben Dam + Nzoia river	17.50	22.05	
770	Burnt Forest	U-111	Kipkaren river	0.16	0.20	
810	Kabarnet	U-112	Kirandich Dam	0.71	0.89	
810	Maji Mazuri	U-113	Maji Mazuri river	0.39	0.50	
810	Eldama Ravine	U-114	Chemususu Dam	0.43	0.54	
810	Mogotio	U-115	Molo river /Chemususu Dam	0.22	0.28	
810	Marigat	U-155	Perkerra river	0.20	0.25	
820	Iten+Tambach	U-116	Moiben Dam	0.45	0.57	
830	Nandi Hills	U-117	Mokong River	0.10	0.12	
830	Kapsabet+Baraton	U-118	Mokong river	1.14	1.43	
840	Maralal	U-119	Loikas/Yamo river	1.50	1.89	
840	Wamba	U-120	Boreholes	0.32	0.40	
840	Baragoi	U-121	Boreholes + Sub-surface dam	0.28	0.35	
850	Lodwar	U-122	Boreholes & sub-surface dam	0.81	1.02	
860	Kapenguria/Makutano	U-123	Kapenguria River	0.96	1.21	
910	Bungoma	U-124	Kuywa River	2.80	3.52	
910	Kimilili	U-125	Kimilili River	0.63	0.79	
910	Webuye	U-126	Nzoia River	2.53	3.18	
910	Chaptais	U-157	Sasuri river	0.22	0.28	
920	Busia	U-127	Sio river	1.41	1.78	
920	Nambale	U-158	Sio river	0.18	0.23	
930	Luanda	U-128	Edzawa river	0.14	0.17	
930	Vihiga+Majengo	U-129	Edzawa River (Kimondi River)	0.34	0.43	
930	Kaimosi	U-130	Galagoli river	0.02	0.02	
930	Khayega	U-131	Yala river	0.03	0.04	
930	Kakamega	U-132	Isiukhu River, Mukulusi Dam	7.76	9.78	
930	Butere	U-133	Viratsi River	0.17	0.22	
930	Mumias	U-134	Nzoia River	1.76	2.21	
				562.81	709.14	

Note: ● Construction

Appendix 5.7 Summary of Development Cost for Reduced Development (Alternative-B)

Development Sector	Budget Appropriated for	Financial Requirement (Million)					
		1993 - 2000		2001 - 2010		Total	
		US$	K£	US$	K£	US$	K£
1. D&I Water Supply		3,032	3,821	2,756	3,472	5,788	7,293
(1) Urban water supply	MOWD *1	2,047	2,580	1,771	2,231	3,818	4,811
(2) Rural water supply	MOWD *2	985	1,241	985	1,241	1,970	2,482
2. Sewerage Development	MOLG *3	310	390	253	319	563	709
Total		3,342	4,211	3,009	3,791	6,351	8,002

Notes: Executing agencies will be;
*1 : MOWD, NWCPC, Municipalities (NCC, etc)
*2 : MOWD, NWCPC, County councils, NGO, etc
*3 : Municipal and urban councils under technical assistance by MOWD

Appendix 5.8 Annual Budgetary Schedule for Reduced Development (Alternative-B)

(Unit : million US$)

Development Sector	Year																		Total
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
1 D&I Water Supply	537.9	537.9	424.7	424.7	293.1	293.1	260.5	260.5	264.6	264.6	306.5	306.5	280.6	280.6	261.4	261.4	265.1	265.0	1,943
(1) Urban water supply	414.7	414.7	301.6	301.6	169.9	169.9	137.4	137.4	166.0	166.0	208.0	208.0	182.1	182.1	162.9	162.9	166.6	166.6	3,818
(2) Rural water supply	123.2	123.2	123.2	123.2	123.2	123.2	123.2	123.2	98.5	98.5	98.5	98.5	98.5	98.5	98.5	98.5	98.5	98.5	1,970
2 Sewerage Development (for 158 urban centres)	74.9	74.9	47.6	47.6	14.5	14.5	17.8	17.8	22.6	22.6	22.8	22.8	36.8	36.8	24.1	24.1	20.3	20.3	563
Total	612.7	612.7	472.3	472.3	307.6	307.6	278.3	278.3	287.2	287.2	329.3	329.3	317.3	317.3	285.5	285.5	285.4	285.4	6,351

APPENDIX 6

FURTHER STUDY PROGRAMMES

Appendix 6.1 Estimated Cost of Studies and Design of Individual Projects by Development Sector (1/3)

Description	Executing Agency	Cost (million) US$	Cost (million) K£	Implementation Schedule 93 95 2000 2 4 6 8 10
1. D&I Water Supply				
(1) Urban water supply *1	MOWD	259.41	326.85	
(2) Rural water supply	MOWD	197.05	248.29	
Sub-Total of Item 1.		**456.46**	575.14	
2. Sewerage Development	MOLG	52.87	66.62	
3. Irrigation Development				
(1) Major irrigation projects	MORD			
- Kano Plain	MORD	11.63	14.65	★ ★
- Bunyala Ext.	MORD	0.93	1.17	☆ ☆ ★ ★
- Mwea Ext.	MORD	4.78	6.02	☆ ★ ★
- Kunati	MORD	0.26	0.33	☆ ☆ ★ ★
- Lower Kuja	MORD	0.42	0.53	☆ ★ ★
- Lower Rupigazi	MORD	0.45	0.57	☆ ☆ ★ ★
- Kanzalu	MORD	2.86	3.60	☆ ☆ ★ ★
- Kimira	MORD	1.36	1.71	☆ ☆ ★ ★
- Yala Swamp	MORD	4.88	6.14	☆ ★ ★ ★
- Arror	MORD	0.47	0.60	☆ ☆ ★ ★
- Sabaki Ext.	MORD	1.49	1.87	☆ ☆ ★ ★
- Thanantu	MORD	1.30	1.64	☆ ☆ ★ ★
- Kibwezi Ext.	MORD	17.04	21.47	☆ ☆ ★ ★
- Upper Nzoia	MORD	6.60	8.32	☆ ☆ ★ ★
- Turkwel	MORD	0.13	0.17	☆ ☆ ★ ★
- Taveta	MORD	0.89	1.13	☆ ☆ ★ ★
- Lower E.'Ngiro	MORD	4.28	5.39	☆ ☆ ★ ★
(2) Small irrigation schemes	MOA	0.77	0.97	
Sub-Total of Item 3.		**60.53**	76.27	
4. Livestock Water				
(1) Source development	MOLD	50.24	63.30	
(2) Water points in nomadic pasturage land	MOLD	5.48	6.90	
Sub-Total of Item 4.		**55.72**	70.20	

Note : ☆ Study ★ Design ▒ *Study/Design Continues intermittently*

*1 excluding the cost of groundwater source development schemes

Appendix 6.1 Estimated Cost of Studies and Design of Individual Projects by Development Sector (2/3)

Description	Executing Agency	Cost (million) US$	Cost (million) K£	Implementation Schedule 93	95	2000	2	4	6	8	10
5. Hydropower Development	MOE										
- Low Grand Falls	KPC/ TARDA	21.83	27.50	☆	☆	★	★				
- Oldorko	KPC	5.33	6.71		☆	☆	★	★			
- Magwagwa	KPC/ LBDA	17.00	21.42				★	★			
- Gitaru #3 Extension	KPC/ TRDC	-	-			☆		★	★		
- Mutonga	KPC/ TARDA	11.18	14.08				☆	☆	★	★	
Sub-Total of Item 5.		**55.33**	69.71								
6.River and Flood Works											
(1) Major flood control projects	MOWD										
- Kano Plain (Nyando river)	MOWD/ LBDA	1.55	1.96	☆	★	★					
- Nairobi City (Nairobi river, etc)	MOLG	0.81	1.02		☆	★	★				
- Yala Swamp (Yala/Nzoia river)	MOWD/ LBDA	1.33	1.67				☆	★	★		
- Kuja Rivermouth (Kuja river)	MOWD/ LBDA	0.38	0.47					☆	★	★	
- Lumi Rivermouth (Lumi river)	MOWD	0.62	0.78						☆	★	★
(2) Urban drainage works	MOLG										
- Nairobi	MOLG	18.00	22.68	★	★						
- Kiambu	MOLG	0.97	1.22						☆	★	☆
- Thika	MOLG	1.11	1.40						☆	★	★
- Kerugoya	MOLG	0.58	0.73						☆	★	★
- Muranga	MOLG	2.36	2.98					☆	★	★	
- Olkalou	MOLG	0.45	0.57						☆	★	★
- Nyeri	MOLG	0.98	1.24				☆	★	★		
- Kilifi	MOLG	0.37	0.47						☆	★	★
- Malindi	MOLG	0.57	0.72						☆	★	★
- Kwale	MOLG	0.54	0.68						☆	★	★
- Lamu	MOLG	0.53	0.66					☆	★	★	
- Mombasa	MOLG	3.49	4.40		☆	★	★				
- Voi	MOLG	0.69	0.87						☆	★	★
- Wundanyi	MOLG	0.17	0.21						☆	★	★
- Hola	MOLG	0.56	0.70						☆	★	★
- Embu	MOLG	0.57	0.72				☆	★	★		
- Isiolo	MOLG	0.27	0.34					☆	★	★	
- Kitui	MOLG	0.27	0.34						☆	★	★
- Mchakos	MOLG	1.66	2.09		☆	★	★				
- Mitaboni	MOLG	0.12	0.15		☆	★	★				
- Marsabit	MOLG	0.06	0.08					☆	★	★	
- Meru	MOLG	0.20	0.26			☆	★	★			

Note : ☆ Study ★ Design ▒ Study/Design Continues intermittently

*1 excluding the cost of groundwater source development schemes

Appendix 6.1 Estimated Cost of Studies and Design of Individual Projects by Development Sector (3/3)

Description	Executing Agency	Cost (million) US$	Cost (million) K£	Implementation Schedule 93 95 2000 2 4 6 8 10
- Garissa	MOLG	0.48	0.60	
- Mandera	MOLG	0.04	0.05	
- Wajir	MOLG	0.12	0.15	
- Kisii	MOLG	1.58	1.99	
- Kisumu	MOLG	2.51	3.16	
- Siaya	MOLG	0.07	0.09	
- Homa Bay	MOLG	0.69	0.87	
- Kajiado	MOLG	0.69	0.87	
- Kericho	MOLG	0.70	0.88	
- Nanyuki	MOLG	1.17	1.48	
- Naivasha	MOLG	0.54	0.68	
- Nakuru	MOLG	3.89	4.90	
- Narok	MOLG	0.48	0.61	
- Kitale	MOLG	1.89	2.38	
- Eldoret	MOLG	2.57	3.24	
- Kabarnet	MOLG	0.10	0.12	
- Kapsabet/Baraton	MOLG	0.20	0.25	
- Iten	MOLG	0.98	1.24	
- Maralal	MOLG	0.42	0.53	
- Lodwar	MOLG	0.13	0.17	
- Kapenguria/Makutano	MOLG	0.21	0.26	
- Bungoma	MOLG	1.12	1.41	
- Webuye	MOLG	0.14	0.17	
- Busia	MOLG	0.07	0.09	
- Kakamega	MOLG	1.24	1.56	
(3) Minor river improvement				
- Various rivers	MOWD	6.75	8.51	
(4) Improvement of Lower Tana				
- Lower Tana improvement	MOWD/ TARDA	3.00	3.78	
Sub-Total of Item 6.		**70.99**	**89.44**	
Total		**751.89**	**947.38**	

Note : ☆ Study ★ Design ▒ Study/Design Continues intermittently

*1 excluding the cost of groundwater source development schemes

Appendix 6.2 River Basin Development Study - Proposed Study Programme

District Code	Description	Executing Agency	Cost (million)		Implementation Schedule
			US$	K£	93 95 2000 2 4 6 8 10
	Lake Victoria Drainage Area				
910 920	1. Sio/Malaba River Basin Study	LBDA	2.0	2.5	☆☆☆
630, 910, 930 760, 770, 830	2. Nzoia/Yala River Basin Study	LBDA	3.0	3.8	☆☆☆
620 720	3. Nyando River Basin Study	LBDA	2.5	3.2	☆☆☆
	Rift Valley Drainage Area				
810, 820 850, 860	4. Kerio River Basin Study (Update)	KUDA	2.0	2.5	☆☆☆
740 240	5. Nakuru and Environs Integrated Water Use Study	NWCPC	3.0	3.8	☆☆☆
710 750	6. Ewaso Ngiro South River Basin Study	ENSRDA	2.5	3.2	☆☆☆
	Athi River Drainage Area				
110, 210, 440 710, 350, 310	7. Athi River Basin Study (Update)	TARDA	4.0	5.0	☆☆☆☆☆
	Tana River Drainage Area				
220, 230, 250 410, 460, 420 430, 360, 510	8. Tana River Basin Study (Update)	TARDA	4.0	5.0	☆☆☆☆☆
730, 240, 840 420, 450, 510	9. Ewaso Ngiro North River Basin Study	ENNRDA	2.5	3.2	☆☆☆
	Total		25.5	32.1	

Note: ☆ Study

Appendix 6.3 Groundwater Resources Study for Urban Water Supply - Proposed Study Programme

District Code	Description	Executing Agency	Cost (million) US$	Cost (million) K£	Study Schedule 93		95					2000		2		4		6		8		10
320	1. Msambweni	MOWD / NWCPC	1.6	2.0				☆														
420	2. Isiolo	MOWD / NWCPC	3.6	4.5			☆	☆														
420	3. Garbatula	MOWD / NWCPC	1.6	2.0		☆																
450	4. North Horr	MOWD / NWCPC	1.6	2.0		☆																
450	5. Korr	MOWD / NWCPC	1.6	2.0				☆														
450	6. Kargi	MOWD / NWCPC	1.6	2.0		☆																
450	7. Marsabit	MOWD / NWCPC	3.6	4.5	☆	☆																
450	8. Sololo	MOWD / NWCPC	1.6	2.0		☆																
450	9. Moyale	MOWD / NWCPC	1.6	2.0				☆														
510	10. Mudo Gashe	MOWD / NWCPC	1.6	2.0		☆																
510	11. Ijara	MOWD / NWCPC	1.6	2.0		☆																
510	12. Kotile	MOWD / NWCPC	1.6	2.0		☆																
520	13. Elwak	MOWD / NWCPC	1.6	2.0		☆																
530	14. Wajir	MOWD / NWCPC	5.4	6.8	☆	☆	☆															
530	15. Buna	MOWD / NWCPC	3.6	4.5	☆	☆																
530	16. Bute	MOWD / NWCPC	1.6	2.0		☆																
640	17. Nyabikaye	MOWD / NWCPC	1.6	2.0		☆																
730	18. Rumuruti	MOWD / NWCPC	1.6	2.0		☆																
730	19. Nyahururu	MOWD / NWCPC	3.6	4.5					☆	☆												
840	20. Wamba	MOWD / NWCPC	1.6	2.0		☆																
840	21. Barogoi	MOWD / NWCPC	3.6	4.5	☆	☆																
850	22. Lodwar	MOWD / NWCPC	3.6	4.5			☆	☆														
	TOTAL		51.0	64.3																		

Note : ☆ Study

Appendix 6.4 District Water Resources Study - Proposed Study Programme (2/2)

District Code	Description	(Basin Study proposed)	Executing Agency	US$	K£	93 95 2000 2 4 6 8 10
	Nyanza Province					
610	Kisii/Nyamira		MOWD	2.0	2.52	☆ ☆ ☆
620	Kisumu	(Nyando)	"	2.5	3.2	o o o ☆ ☆
630	Siaya	(Yala)	"	2.0	2.5	o o o ☆ ☆
640	South Nyanza		"	2.0	2.5	☆ ☆ ☆
	Rift Valley Province					
710	Kajiado	(Athi)	MOWD	–	–	☆ ☆ (WRAP underway)
720	Kericho		"	2.5	3.2	☆ ☆ ☆
730	Laikipia	(Ewaso Ngiro N.)	"	–	–	(WRAP completed)
740	Nakuru	(Nakuru)	"	2.0	2.5	o o o ☆ ☆
750	Narok	(Ewaso Ngiro N.)	"	2.5	3.2	o o o ☆ ☆
760	Trans Nzoia	(Nzoia)	"	2.0	2.5	o o o ☆ ☆
770	Uasin Gishu	(Nzoia)	"	2.0	2.5	o o o ☆ ☆
810	Baringo		MOWD	–	–	(WRAP completed)
820	Elgeyo Marakwe	(Kerio)	"	–	–	(WRAP completed)
830	Nandi	(Yala)	"	2.0	2.5	o o o ☆ ☆
840	Samburu	(Ewaso Ngiro N.)	"	–	–	(WRAP completed)
850	Turkana		"	3.0	3.8	☆ ☆ ☆
860	West Pokot		"	–	–	(WRAP completed)
	Western Province					
910	Bungoma	(Nzoia)	MOWD	2.0	2.5	o o o ☆ ☆
920	Busia	(Sio)	"	2.0	2.5	o o o ☆ ☆
930	Kakamega/Vihig	(Nzoia)	"	2.0	2.5	o o o ☆ ☆
	Total			59.0	74.3	

Note: ☆ District Study
o River Basin Study (proposed under separate programme)

Appendix 6.4 District Water Resources Study - Proposed Study Programme (1/2)

District Code	Description	(Basin Study proposed)	Executing Agency	Cost (million) US$	Cost (million) K£	Implementation Schedule 93 95 2000 2 4 6 8 10
	Nairobi Province					
110	Nairobi	(Athi)	NCC	–	–	(To be coveredby separate studies)
	Central Province					
210	Kaimbu	(Athi)	MOWD	2.0	2.5	o o o o o ☆ ☆
220	Kirinyaga	(Tana)	"	2.0	2.5	o o o o o ☆
230	Muranga	(Tana)	"	2.0	2.5	o o o o o ☆
240	Nyandarua	(Nakuru)	"	2.0	2.5	o o o ☆ ☆
250	Nyeri	(Tana)	"	2.0	2.5	o o o o o ☆
	Coast Province					
310	Kilifi		MOWD	2.5	3.2	☆ ☆ ☆ (WRAP underway for two divisions)
320	Kwale		"	3.0	3.8	☆ ☆ ☆
330	Samu		"	–	–	☆ ☆ ☆ (WRAP proposed)
340	Mombasa		"	2.5	3.2	☆ ☆ ☆
350	Taiota Taveta		"	2.5	3.2	☆ ☆ ☆
360	Tana River	(Tana)	"	–	–	☆ ☆ (WRAP proposed)
	Eastern Province					
410	Embu	(Tana)	MOWD	2.5	3.2	o o o o o ☆
420	Isiolo	(Ewaso Ngiro N.)	"	–	–	(WRAP proposed)
430	Kitui	(Tana)	"	2.5	3.2	o o o o o ☆
440	Machakos/Maku	(Athi)	"	–	–	☆ ☆ ☆ (WRAP proposed)
450	Marsabit	(Ewaso Ngiro N.)	"	–	–	☆ ☆ (WRAP proposed)
460	Meru	(Tana)	"	–	–	(WRAP completed)
	North Eastern Province					
510	Garissa		MOWD	–	–	☆ ☆ (WRAP proposed)
520	Mandera		"	3.0	3.8	☆ ☆ ☆
530	Wajir		"	–	–	☆ ☆ (WRAP proposed)

Note: ☆ Study
o River Basin Study (proposed under separate programme)

Appendix 6.5 Programmes for Data Collection and Water Management (1/2)

District Code	Description	Executing Agency	Cost (million)		Implementation Schedule
			US$	K£	93 95 2000 2 4 6 8
	1. Surface Water Management				
	(1) Hydrological data management				
	(a) Reinstatement of river water level gauging stations	MOWD	1.6	2.0	☆☆☆☆☆☆☆☆
	(b) Reinforcement of MOWD database system	MOWD	0.2	0.3	☆☆
	(c) Reinforcement of regional offices' activities	MOWD	2.0	2.5	☆☆☆☆
	(2) Water abstraction permit data - review and upgrading, including water use survey for Upper Athi and Upper Tana basins	MOWD	2.5	3.2	☆☆☆
	(3) Assessment of river maintenance discharge	MOWD	Included in (2) above		☆☆☆
	(4) Reinforcement of water use monitoring/control activities	MOWD	2.0	2.5	☆☆☆☆
	Sub-total		8.3	10.5	
	2. Groundwater Resources Management				
	(1) Groundwater data management	MOWD	0.1	0.1	☆☆
	(2) Assessment of groundwater potential	MOWD	–	–	☆☆☆☆☆☆☆☆
	Sub-total		0.1	0.1	
	3. Water Quality and Pollution Control				
	(1) Water quality monitoring programme				
	(a) Surface water quality monitoring programme	MOWD	2.5	3.2	☆☆
	(b) Groundwater quality monitoring programme	MOWD	3.0	3.8	☆☆☆
	(2) Establishment of water quality standards	MOWD	1.5	1.9	☆☆☆
	(3) Enforcement of water pollution control	MOWD	6.5	8.2	☆☆☆☆☆☆☆
	Sub-total		13.5	17.0	

Note: ☆ Study

Appendix 6.5 Programmes for Data Collection and Water Management (2/2)

District Code	Description	Executing Agency	Cost (million) US$	Cost (million) K£	Implementation Schedule 93 95 2000 2 4 6 8 10
	4. Domestic/Industrial Water Supply				
	(1) Inventory list of water supply facilities	MOWD	–	–	☆ ☆
	(2) Measurement of water supply	MOWD	20	25.2	☆ ☆ ☆ ☆ ☆ ☆ ☆
	Sub-total		20	25.2	
	5. Irrigation Inventory/Water Use Record				
	(1) Inventory list of irrigation schemes	MOA	–	–	☆ ☆
	(2) Irrigation water use recrod	MOA	–	–	☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆
	6. Livestock and Wildlife Water Facilities Inventory				
	(1) Inventory survey	MOLD MOTW	–	–	☆ ☆ ☆
	(2) Livestock/wildlife population survey	DRSRS	2.0	2.5	☆ ☆
	Sub-total		2.0	2.5	
	7. Hydropower Resources Survey				
	Update of National Power Development Plan	MOE	3.0	3.8	☆ ☆
	8. River/Flood Control Works				
	(1) Inventory survey of rivers and river facilities	MOWD	–	–	☆ ☆
	(2) Formulation of river improvement works	MOWD	–	–	☆ ☆ ☆
	(3) Urban drainage hydrological studies - Installation of hourly rainfall gauges	KMD	0.1	0.1	☆ ☆ ☆ ☆ ☆
	Sub-total		0.1	0.1	
	Total		47.0	59.2	

Note: ☆ Study

Appendix 6.6 Environmental Studies - Proposed Study Programme

District Code	Description	Executing Agency	Cost (million)		Implementation Schedule
			US$	K£	93 95 2000 2 4 6 8 10
	Regional Environmental Study				
750	1. Mara river environmental study	NES	1.5	1.9	☆ ☆ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○
350	2. Lake Jipe environmental study	NES	1.5	1.9	☆ ☆ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○
850	3. Lake Turkana environmental study	NES	2.0	2.5	☆ ☆ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○
	Environmental Impact Assessment and Management Guidelines				
-	4. Preparation of environmental guidelines	NES	2.5	3.2	Δ Δ Δ Δ ☆ ☆ ☆ ☆
	Total		7.5	9.5	

Note:
- ☆ Study
- Δ Data and information accumulation
- ○ Monitoring

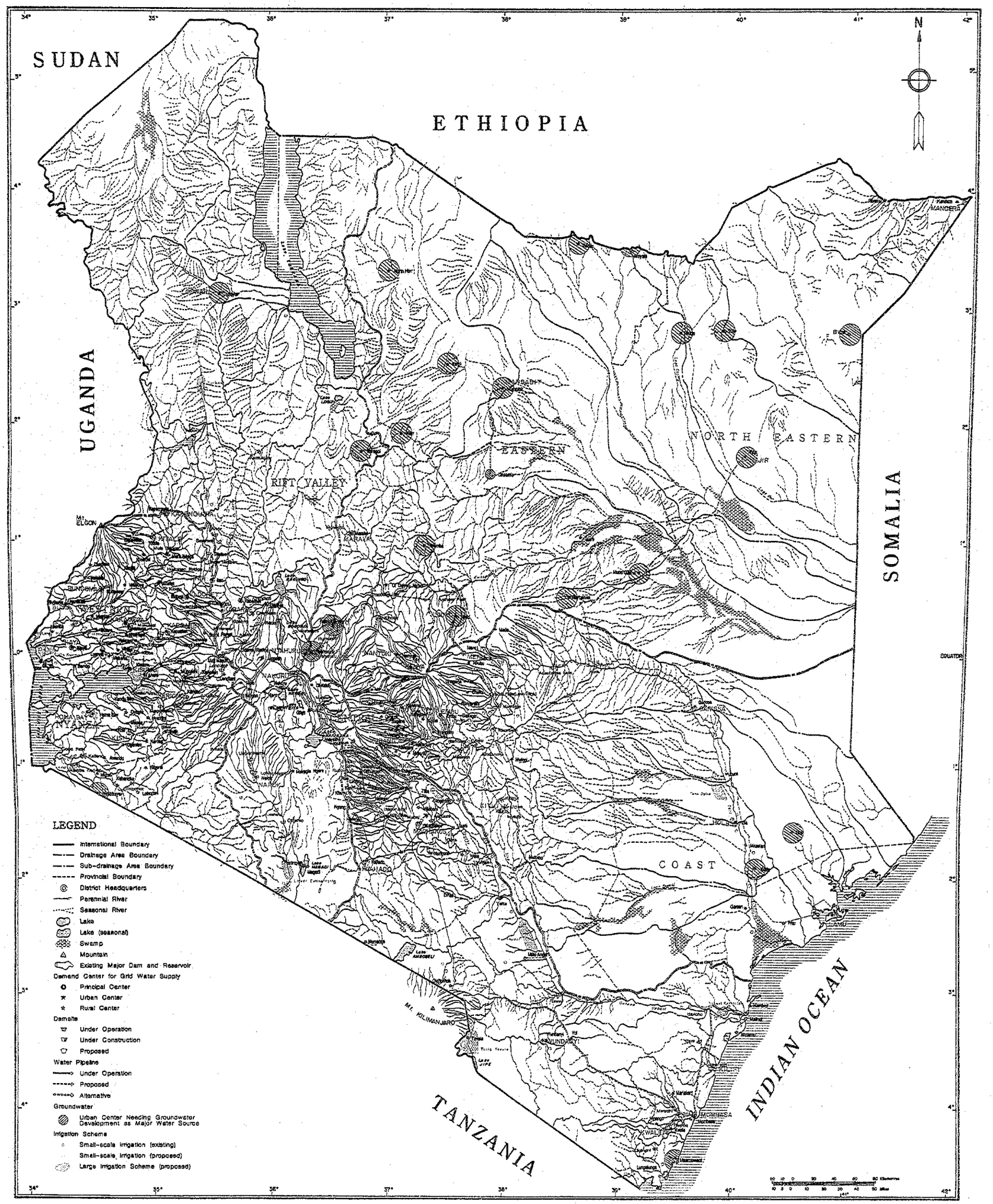
Appendix 6.7 Further Study Programme - Annual Budgetary Schedule

(Unit : thousand US$)

Development Sector	Year																		Total
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
A. Development Project																			
1 D&I Water Supply	24,119	24,119	24,119	24,119	24,119	24,119	24,119	24,119	26,351	26,351	26,351	26,351	26,351	26,351	26,350	26,350	26,350	26,351	456,459
(1) Urban water supply	19,525	19,525	19,525	19,525	19,525	19,525	19,525	19,525	10,321	10,321	10,321	10,321	10,321	10,321	10,320	10,320	10,320	10,320	259,406
(2) Rural water supply	4,594	4,594	4,594	4,594	4,594	4,594	4,594	4,594	16,030	16,030	16,030	16,030	16,030	16,030	16,030	16,030	16,030	16,031	197,053
2 Sewerage Development	3,937	3,937	3,937	3,937	3,937	3,937	3,937	3,937	2,137	2,137	2,137	2,137	2,138	2,138	2,138	2,138	2,138	2,138	52,872
3 Irrigation Development	7,604	7,648	1,990	655	2,673	2,296	5,610	6,861	1,770	1,992	9,722	7,967	385	1,766	1,466	42	42	42	60,531
(1) *Major irrigation projects*	7,561	7,605	1,947	612	2,630	2,253	5,567	6,818	1,727	1,949	9,679	7,924	342	1,723	1,424	0	0	0	59,761
(2) Small irrigation schemes	43	43	43	43	43	43	43	43	43	43	43	43	43	43	42	42	42	42	770
4 Livestock Water Development	2,334	2,334	2,334	2,334	2,334	2,334	2,334	2,334	3,705	3,705	3,705	3,705	3,705	3,705	3,704	3,703	3,703	3,703	55,715
(1) Source development	2,128	2,128	2,128	2,128	2,128	2,128	2,128	2,128	3,322	3,322	3,322	3,322	3,322	3,322	3,321	3,321	3,321	3,321	50,240
(2) Water points in normadic pasturage land	206	206	206	206	206	206	206	206	383	383	383	383	383	383	383	382	382	382	5,475
5 Hydropower Development	3,638	4,525	8,163	7,275	12,138	12,138	0	3,724	3,724	0	0	0	0	0	0	0	0	0	55,325
6 River and Flood Works	5,510	5,510	5,780	5,262	5,262	5,435	5,435	5,435	2,636	2,636	2,761	2,761	2,969	2,844	2,844	2,637	2,637	2,637	70,987
(1) Major flood control projects	518	518	788	270	270	443	443	443	0	0	125	124	332	207	207	0	0	0	4,688
(2) Urban drainage works	4,242	4,242	4,242	4,242	4,242	4,242	4,242	4,242	2,261	2,261	2,261	2,261	2,261	2,261	2,261	2,262	2,262	2,262	56,549
(3) Minor river improvement	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	6,750
(4) Improvement of Lower Tana	375	375	375	375	375	375	375	375											3,000
Sub-total of Item A	47,142	48,073	46,323	43,582	50,463	50,259	41,435	46,410	40,323	36,821	44,676	42,921	35,548	36,804	36,502	34,870	34,870	34,871	751,889
B. River Basin Study	1,833	4,467	5,300	4,267	3,767	2,933	2,133	800	0	0	0	0	0	0	0	0	0	0	25,500
C. Groundwater Resources Study	6,400	27,200	5,000	8,800	1,600	2,000													51,000
D. District Water Sources Study	6,556	6,556	6,556	6,556	6,556	6,555	6,555	6,555	6,555										59,000
E. Data Collection/Water Management	213	6,693	7,693	8,193	6,693	5,018	4,998	7,499	0	0	0	0	0	0	0	0	0	0	47,000
F. Enironmental Study	313	313	406	406	513	513	680	680	368	368	368	368	368	368	367	367	367	367	7,500
Sub-total Items A to F	62,457	93,302	71,278	71,804	69,592	67,278	55,801	61,944	47,246	37,189	45,044	43,289	35,916	37,172	36,869	35,237	35,237	35,238	941,889
G. Additional Study	18,737	27,990	21,383	21,541	20,878	20,183	16,740	18,583	14,174	11,157	13,513	12,987	10,775	11,151	11,061	10,571	10,571	10,571	282,567
GRAND TOTAL	81,193	121,292	92,661	93,345	90,470	87,461	72,541	80,527	61,420	48,346	58,557	56,276	46,690	48,323	47,929	45,808	45,808	45,809	1,224,455

ATTACHED DRAWINGS

WATER RESOURCES DEVELOPMENT PLAN



SURFACE WATER INFORMATION MAP