

Table 4.1.2 Projected Urban Population by Town : 1990-2010 (1/7)

Town Name	Location of Town Centre		Projected Urban Population (1000)				
	Code	Location Name	1990	1995	2000	2005	2010
Nairobi(*)(**)	110		1,413.1	1,779.6	2,260.5	2,784.8	3,465.3
Kiambu	210						
Karuri	211.1	Kiambaa	16.2	22.7	31.7	38.4	46.3
Kiambu(*)	211.4	Kiambu Municipality	4.5	6.8	10.3	13.1	16.6
Gatundu+Ngenda	212.1	Ngenda	0.0	0.0	1.5	1.7	2.0
Mangu	212.2	Mangu	0.0	0.0	0.5	0.6	0.7
Kiganjo	212.3	Kiganjo	0.0	0.0	0.5	0.6	0.6
Limuru	213.1	Limuru	1.6	2.2	3.1	3.8	4.6
Tigoni	213.2	Tigoni	0.0	0.0	1.8	2.0	2.3
Ruiru	214.1	Ruiru	14.3	20.0	27.9	33.9	40.9
Ndarugu	214.3	Juja	0.0	0.0	1.9	2.2	2.6
Thika	214.4	Thika Municipality	59.0	89.4	135.4	172.0	217.4
Githunguri	215.1	Githunguri	3.8	5.8	8.7	11.1	14.0
Wangige	216.1	Kabete	0.0	0.0	0.9	1.0	1.1
Kikuyu	216.6	Kikuyu	6.1	9.2	14.0	17.8	22.5
Kimende	217.2	Kijabe	0.0	0.0	0.4	0.5	0.6
Kagwe	217.3	Gatamayu	0.0	0.0	2.9	3.3	3.8
Kirinyaga	220						
Wanguru	221.1	Tebere	0.0	0.0	1.0	1.2	1.4
Sagana	222.2	Kiinc	2.9	4.5	6.7	8.7	11.1
Kerugoya(*)	222.3	Inoi	8.9	13.8	20.7	26.7	34.1
Baricho	222.4	Mwerua	0.9	1.3	1.8	2.2	2.7
Kutus	223.2	Kabare	6.3	9.6	14.3	18.4	23.4
Kianyaga	223.3	Baragwi	0.4	0.6	0.8	1.0	1.2
Murang'a	230						
Kabati	231.3	Gaichanjiru	0.0	0.0	0.8	1.0	1.1
Kandara	231.4	Muruka	0.7	0.9	1.3	1.5	1.8
Karwara(Gatanga)	231.5	Gatanga	0.0	0.0	0.7	0.8	0.9
Kigumo	232.2	Kigumo	0.0	0.0	0.7	0.8	0.9
Saba Saba	232.6	Kamahuha	0.0	0.0	0.4	0.5	0.6
Maragwa	232.7	Maragua Ridge	35.5	47.7	64.2	76.5	91.1
Kangema	233.4	Iyego	1.5	2.0	2.7	3.2	3.9
Kahuro(Mariranjies)	234.1	Mugoiri	0.5	0.7	1.9	2.2	2.5
Murang'a(*)	234.3	Mbiri	21.7	31.3	45.2	56.3	70.0
Makuyu	235.1	Makuyu	5.1	7.4	10.6	13.2	16.5
Nyandarua	240						
OI Kalou(*)	241.3	OI Kalou	9.7	15.5	24.8	30.8	37.8
OI'Joro Orok	242.1	OI'Joro Orok	0.6	0.9	1.3	1.5	1.8
Mairo Inya	243.3	Kiriita	1.6	2.3	3.4	4.1	4.8
Kipipiri	244.3	Kipipiri	0.0	0.0	0.6	0.6	0.7
North Kinangop	245.1	North Kinangop	0.0	0.0	1.0	1.1	1.2
Njabini	245.3	South Kinangop	0.0	0.0	1.0	1.2	1.3
Nyeri	250						
Naro Moru	251.2	Kamburaini	0.0	0.0	0.6	0.8	0.9
Mweiga	252.1	Mweiga	0.0	0.0	0.4	0.5	0.6
Karatina	254.3	Kirimukuyu	5.4	8.2	12.2	16.0	20.6
Ihururu	255.4	Muhoya	0.0	0.0	0.3	0.4	0.4
Othaya	256.1	Karima	4.8	7.3	10.8	14.2	18.3
Nyeri(*)(**)	257.0	Nyeri Municipality	97.0	146.7	218.6	286.7	370.7

Remark : (*) means the administrative head-quarters of the District.

(**) means the administrative head-quarters of the Province.

Zero figures in 1990 and 1995 mean that towns (rural centres at present) are assumed to be raised to the status of urban centres by 2000.

(To be continued)

Talbe 4.1.2 Projected Urban Population by Town : 1990-2010 (2/7)

Town Name	Location of Town Centre		Projected Urban Population (1000)				
	Code	Location Name	1990	1995	2000	2005	2010
Kilifi	310						
Kaloleni	311.1	Kaloleni	0.0	0.0	0.8	1.0	1.2
Mariakani	311.3	Mariakani	7.6	12.6	19.4	25.6	33.1
Mazeras	311.6	Rabai	0.0	0.0	0.6	0.7	0.8
Bamba	312.2	Bamba	0.0	0.0	0.4	0.4	0.5
Kilifi(*)	313.2	Tezo	12.5	20.8	32.0	42.1	54.4
Kakoneni	314.2	Jilore	0.0	0.0	0.2	0.3	0.3
Watamu	314.3	Gede	2.1	3.5	5.4	7.1	9.1
Malindi	314.4	Malindi Town	36.7	61.0	93.9	123.6	159.8
Mambrui	314.6	Magarini	3.2	4.8	6.8	8.5	10.5
Kwale	320						
Kwale(*)	321.1	Shimba North	3.7	5.6	9.6	12.1	15.2
Kinango	323.1	Kinango South	0.0	0.0	4.3	5.0	5.7
Msambweni	324.1	Msambweni	8.4	12.8	21.8	27.5	34.5
Lungalunga	324.5	Lungalunga	2.6	3.6	5.6	6.8	8.1
Ukanda	324.8	Diani	0.0	0.0	1.5	1.7	1.9
Lamu	330						
Witu	331.0	Witu	3.3	5.1	7.5	9.7	12.4
Lamu(*)	333.2	Lamu Town	9.0	13.9	20.3	26.4	33.9
Mombasa(*)(**)	340		479.6	570.4	672.9	783.9	904.4
Taita Taveta	350						
Taveta	351.1	Taveta	12.1	15.9	20.6	24.3	28.8
Voi	352.4	Voi	12.2	17.1	23.6	29.0	35.9
Wundanyi(*)	353.2	Werugha	2.7	3.8	5.2	6.4	8.0
Tana River	360						
Bura+Madogo	362.3	Bura	0.0	0.0	2.1	2.4	2.8
Hola(*)	363.3	Zabaki	8.1	12.9	21.6	27.6	34.8
Wenje	363.6	Gwano	0.0	0.0	0.3	0.3	0.4
Garsen	364.1	Bilisa	3.6	5.2	7.9	9.7	11.7
Tarassa	364.4	Mgao	0.0	0.0	1.2	1.3	1.5
Embu	410						
Manyatta	411.2	Ngandori	0.0	0.0	0.5	0.5	0.6
Runyenjes	411.8	Kigaari South	2.0	2.9	4.1	5.0	6.1
Siakago	412.1	Nthawa	0.0	0.0	0.5	0.6	0.7
Ishara	412.4	Evurore	0.0	0.0	0.5	0.6	0.7
Kiritiri	413.3	Mavuria	0.0	0.0	0.6	0.7	0.8
Embu(*)(**)	413.7	Embu Municipality	18.4	28.8	44.4	57.1	72.9
Isiolo	420						
Isiolo(*)	421.1	Central	15.9	30.2	49.1	67.0	88.0
Oldonyonyiro	421.2	Oldonyonyiro	4.4	7.4	10.9	14.1	17.5
Gargatula	422.1	Garbatula	1.9	3.2	4.7	6.1	7.6
Madogashe	422.4	Madogashe/Eldera	0.0	0.0	0.2	0.2	0.3
Merti	423.1	Merti	5.7	9.6	14.2	18.2	22.7
Kitui	430						
Kitui(*)	431.4	Changwithya	9.3	15.1	24.3	31.7	40.7
Miambani	431.5	Miambani	0.0	0.0	0.2	0.3	0.3
Ndooa(Muti)	432.1	Mutito	0.0	0.0	0.2	0.2	0.2
Mutomo	433.2	Mutomo	0.0	0.0	1.1	1.3	1.5
Ikutha	433.4	Ikutha	0.0	0.0	0.4	0.5	0.6
Kisasi	433.6	Voo	0.0	0.0	0.2	0.3	0.3
Migwani	434.2	Migwani	0.0	0.0	0.1	0.1	0.1
Mwingi	434.4	Mwingi	7.3	11.8	19.1	24.9	32.0
Kyuso	435.1	Mivukoni	0.0	0.0	0.6	0.7	0.8

(To be continued)

Talbe 4.1.2 Projected Urban Population by Town : 1990-2010 (3/7)

Town Name	Location of Town Centre		Projected Urban Population (1000)				
	Code	Location Name	1990	1995	2000	2005	2010
Machakos/Makueni	440						
Machakos(*)	441.1	Muvuti	119.9	188.1	282.2	365.8	469.1
Mitaboni	441.2	Mutituni	0.0	0.0	0.9	1.1	1.3
Athi River	442.3	Settlement Area	25.1	39.4	59.1	76.6	98.2
Syathani	443.2	Mwala	0.0	0.0	0.4	0.4	0.5
Kikima	443.4	Wamunyu	0.0	0.0	0.3	0.3	0.4
Uaani/Tawa	444.3	Kiteta	0.0	0.0	0.5	0.5	0.6
Kangundo	445.1	Kangundo	11.2	17.6	26.4	34.2	43.8
Tala	445.2	Matungulu	2.1	3.0	4.2	5.2	6.3
Matuu	446.2	Matuu	0.0	0.0	2.6	3.1	3.6
Nunguni	447.4	Kilungu	0.0	0.0	0.7	0.8	1.0
Sultan Hamud	447.7	Konza South	1.5	2.2	3.0	3.7	4.5
Makueni	448.1	Makueni	2.3	3.6	5.4	7.0	9.0
Emali	448.3	Nzaui	0.0	0.0	0.6	0.7	0.8
Miito Andei+Kibwezi	449.4	Miito Andei	3.8	5.8	8.4	10.7	13.5
Marsabit	450						
North Horr	451.1	North Horr	2.1	3.3	4.3	5.2	6.2
Kargi	452.2	Kargi	4.3	7.5	10.5	13.1	16.5
Korr	453.1	Korr	5.8	9.1	11.9	14.3	17.2
Marsabit(*)	454.1	Mountain	11.1	19.3	27.0	33.9	42.7
Sololo	455.2	Sololo	3.7	6.4	9.0	11.3	14.2
Moyale	456.1	Moyale	6.8	11.8	16.5	20.8	26.2
Meru	460						
Meru(*)	461.4	Ntima	78.9	125.2	192.9	249.7	319.8
Nkubu	463.1	Nkuene	5.0	7.9	12.2	15.8	20.3
Igoji	463.5	Igoji	0.0	0.0	0.9	1.0	1.2
Kanyakine	463.6	Kanyakine	0.0	0.0	1.1	1.3	1.5
Chogoria	464.1	Chogoria	0.0	0.0	2.1	2.5	2.9
Chuka	464.3	Karingani	4.0	5.8	8.2	10.1	12.4
Miathene	465.7	Muthara	0.0	0.0	1.0	1.1	1.3
Marimanti	466.3	Marimanti	0.0	0.0	0.7	0.8	1.0
Maua	467.2	Maua	4.0	5.8	8.2	10.1	12.4
Kangeta+Lare	467.3	Njia	0.0	0.0	2.2	2.5	3.0
Garissa	510						
Liboi	512.1	Liboi	0.0	0.0	0.7	0.8	1.0
Damajare	512.2	Damajare	0.0	0.0	0.7	0.8	1.0
Mudo Gashe	513.1	Madogashe	2.2	3.0	4.7	5.6	6.7
Goreale	513.3	Goreale	0.0	0.0	0.2	0.3	0.3
Benane	513.4	Benane	0.0	0.0	0.9	1.0	1.2
Hulugho	514.1	Hulugho	0.0	0.0	2.1	2.5	2.8
Sangailu	515.1	Sangailu	0.0	0.0	2.1	2.5	2.8
Ijara	515.2	Ijara	0.0	0.0	2.4	2.8	3.2
Kotile	515.3	Kotile	0.0	0.0	2.4	2.8	3.2
Masalani	515.4	Masalani	0.0	0.0	2.4	2.8	3.2
Dadaab	518.0	Dadaab	1.2	1.6	2.5	3.0	3.6
Garissa(*)(**)	519.1	Sankuri/Garissa	29.1	42.5	73.7	92.0	115.2
Korakora	519.2	Korakora	0.0	0.0	0.6	0.7	0.8
Mandera	520						
Mandera(*)	521.1	Mandera	6.5	8.5	11.7	14.4	18.1
El Wak	523.1	Elwak	10.7	13.2	17.2	20.3	24.3
Rhamu	524.2	Rhamu	4.5	5.5	7.2	8.5	10.1
Takaba	526.1	takaba	0.0	0.0	1.1	1.3	1.5

(To be continued)

Talbe 4.1.2 Projected Urban Population by Town : 1990-2010 (4/7)

Town Name	Location of Town Centre		Projected Urban Population (1000)				
	Code	Location Name	1990	1995	2000	2005	2010
Wajir	530						
Habaswein	531.1	Habaswein	0.0	0.0	0.3	0.4	0.4
Wajir(*)	532.4	Wajir Township	21.4	31.8	46.0	59.0	75.4
Buna	536.2	Buna	6.8	9.3	12.6	15.4	18.7
Bute	537.2	Bute	2.2	3.0	4.1	5.0	6.1
Kisii/Nyamira	610						
Manga	611.2	Eronge	0.0	0.0	1.6	1.8	2.1
Keroka	611.5	East Kitutu	2.5	3.2	4.3	5.1	6.1
Nyamira+Kebirigo	612.2	East Mugirango	10.3	13.9	21.4	26.1	32.3
Keumbu	614.2	Nyaribari Chache East	0.0	0.0	1.3	1.5	1.7
Kisii(*)	615.0	Kisii Municipality	45.8	61.7	90.9	111.5	138.5
Nyamarambe	616.3	South Mugirango Chache	0.0	0.0	1.5	1.7	1.9
Kenyenya	617.3	Majoge Borabu	0.0	0.0	1.9	2.2	2.5
Ogembo	617.5	Kionyo	1.1	1.4	1.9	2.3	2.7
Nyamache	617.6	Bassi borabu	0.0	0.0	1.3	1.4	1.6
Kisumu	620						
Kombewa	621.2	Central Seme	0.0	0.0	0.5	0.6	0.7
Maseno	622.1	West Kisumu	3.0	4.0	5.4	6.5	7.8
Kisumu(*)(**)	622.2	Central Kisumu	188.7	271.8	388.5	490.5	620.8
Kiboswa	622.3	East Kisumu	0.0	0.0	0.6	0.7	0.8
Ahero	623.2	South East Kano	10.3	13.8	18.4	22.2	26.9
Muhoroni	625.2	Muhoroni	8.1	11.7	16.7	21.1	26.6
Miwani+Chemelil	625.4	Miwani	0.0	0.0	3.2	3.7	4.3
Sondu	626.2	South Nyakach	0.0	0.0	1.1	1.3	1.4
Siaya	630						
Asembo Bay	631.6	East Asembo	0.0	0.0	0.4	0.4	0.5
Bondo	632.4	West Sakwa	3.6	4.6	6.1	7.2	8.6
Ng'iya	633.1	South Gem	0.0	0.0	0.2	0.3	0.3
Yala	633.2	East Gem	2.7	3.5	4.5	5.4	6.4
Siaya(*)	634.1	East Alego	19.4	26.5	37.1	45.8	57.1
Rang'ala	635.1	South Ugenya	0.0	0.0	0.4	0.4	0.5
Ukwala	635.4	North Ugenya	1.1	1.4	1.9	2.2	2.6
South Nyanza	640						
Homa Bay(*)	641.1	Kanyada West	23.0	33.8	48.6	59.6	73.8
Rangwe	641.5	Gem	0.0	0.0	0.2	0.3	0.3
Sindo	642.1	Kaksingri	0.0	0.0	0.9	1.0	1.2
Mbita	642.4	Gembe	0.0	0.0	1.1	1.3	1.4
Ndhiwa	643.4	Kanyamwa Kosewe	0.0	0.0	0.8	0.9	1.0
Sori+Karungu	643.5	Karungu	0.0	0.0	1.1	1.3	1.5
Migori	644.3	Suna East	7.5	11.0	15.8	19.4	24.1
Macalder	645.2	Muhuru/South Kadem	0.0	0.0	0.6	0.6	0.7
Kehancha+Tarang'anya	646.3	Bukira East	3.8	5.2	6.9	8.2	9.7
Nyabikaya	646.8	Bugembe West	3.6	4.9	6.6	7.8	9.2
Oyugis	647.4	Central Kasipul	3.8	5.2	6.9	8.2	9.7
Kendu Bay	648.1	Central Karachuonyo	2.7	4.0	5.7	7.0	8.7
Nyangweso	648.5	Kibiri	0.0	0.0	0.3	0.3	0.4
Awendo	649.4	South Sakwa	4.3	5.9	7.9	9.3	11.0
Rongo	649.6	Central Kamagambo	1.4	1.9	2.6	3.0	3.6

(To be continued)

Table 4.1.2 Projected Urban Population by Town : 1990-2010 (5/7)

Town Name	Location of Town Centre		Projected Urban Population (1000)				
	Code	Location Name	1990	1995	2000	2005	2010
Kajiado	710						
Oloitokitok	711.1	Odomongi	4.3	7.4	12.8	18.2	24.4
Ngong+Ongata Rongai	712.1	Ngong	16.1	26.8	44.6	62.1	81.7
Kajiado(*)	713.1	Ildamat	6.0	10.4	17.9	25.4	34.1
Namanga	713.5	Namanga	4.8	8.3	14.3	20.3	27.3
Magadi	714.1	Magadi	2.8	4.8	8.4	11.9	15.9
Kericho	720						
Kaboson	721.1	Sigor South	0.0	0.0	0.7	0.8	0.9
Bomet	722.1	Ekwen	0.0	0.0	1.4	1.6	1.8
Longisa	722.2	Longisa	0.0	0.0	0.7	0.9	1.0
Sotik	723.1	Kepletudo	6.0	7.7	11.1	13.6	16.5
Litein	723.3	Litein	0.0	0.0	1.1	1.3	1.5
Roret	723.4	Kisiara	0.0	0.0	1.7	2.0	2.3
Sosiot	725.1	Waldai	0.0	0.0	1.4	1.6	1.9
Kericho(*)	725.5	Kericho Township	41.2	56.6	88.7	113.8	144.9
Kipkelion	726.1	Kipkelion	2.2	3.0	4.7	6.1	7.7
Londiani	727.1	Londiani	3.2	4.4	6.9	8.8	11.3
Laikipia	730						
Nanyuki(*)	731.5	Nanyuki	25.1	39.3	63.6	87.1	114.9
Rumuruti	733.4	Rumuruti	2.4	3.4	5.1	6.5	8.2
Nyahururu	733.9	Nyahururu Township	14.2	22.3	36.0	49.3	65.0
Nakuru	740						
Gilgil	743.2	Gilgil	14.6	23.9	39.8	55.4	73.8
Naivasha	744.1	Naivasha	38.5	62.9	105.0	146.2	194.5
Njoro	746.1	Njoro	9.1	14.9	24.8	34.6	46.0
Mau Narok	746.4	Mau Narok	0.0	0.0	2.2	2.7	3.2
El Burgon	747.3	El Burgon	12.4	20.3	33.8	47.1	62.6
Molo	747.5	Molo South	10.9	17.8	29.7	41.4	55.1
Nakuru(*)(**)	749.0	Nakuru Municipality	172.2	281.5	469.5	653.9	869.9
Narok	750						
Narok(*)	752.1	Lower Melili	12.0	23.4	42.7	62.7	85.7
Nairangi Enkare (North E)	752.5	Keekonyokie	0.5	0.9	1.4	1.9	2.4
Kilgoris	754.4	Uasin Gishu East	3.3	5.7	9.2	12.6	16.2
Lolgorian	775.1	Siria East	1.7	2.9	4.8	6.5	8.3
Trans Nzoia	760						
Kitale(*)	762.3	Kitale	56.4	85.3	142.3	190.8	249.1
Kiminini/Saboti	762.4	Kiminini	0.0	0.0	3.0	3.6	4.2
Endebess/Kwanza	763.5	Endebess	0.0	0.0	4.8	5.7	6.7
Uasin Gishu	770						
Moi's Bridge	771.2	Moi's Bridge	3.1	4.3	6.3	8.1	10.1
Soy	772.1	Soi	1.1	1.5	2.2	2.9	3.6
Turbo	772.4	Turbo West	4.3	6.0	8.8	11.2	14.0
Eldoret(*)	772.5	Eldoret Municipality	112.9	170.0	272.5	370.3	486.8
Kesses	773.2	Ngeria	0.0	0.0	2.7	3.3	3.9
Burnt Forest	774.6	Olare	2.2	3.1	4.5	5.7	7.1

(To be continued)

Talbe 4.1.2 Projected Urban Population by Town : 1990-2010 (6/7)

Town Name	Location of Town Centre		Projected Urban Population (1000)				
	Code	Location Name	1990	1995	2000	2005	2010
Baringo	810						
Kabartonjo	811.2	Kamnarok Mosop	0.0	0.0	0.5	0.6	0.7
Kabarnet(*)	812.5	Kabarnet Mosop	9.4	13.4	20.5	26.9	34.6
Tenges	813.3	Pokor Keben	0.0	0.0	0.1	0.1	0.1
Maji Mazuri	814.3	Maji Mazuri	5.2	7.4	11.3	14.9	19.1
Eldama Ravine	814.5	Eldama Ravine	5.6	8.0	12.2	16.0	20.6
Mogotio	815.1	Lembus Soi	2.9	4.1	6.3	8.3	10.7
Marigat	816.2	Marigat	3.0	4.0	5.6	7.0	8.6
Chemolingot	817.1	Korosi(Ribkwo)	0.0	0.0	0.3	0.4	0.5
Elgeyo Marakwet	820						
Chepkorio	821.5	Marichor	0.0	0.0	0.3	0.3	0.4
Iten(*)+Tambach	822.4	Kiptuilong	6.1	8.4	12.9	16.0	19.6
Kapsowar	823.1	Koibarak	0.0	0.0	0.1	0.1	0.2
Chebiemit	823.2	Moiben	0.0	0.0	0.3	0.3	0.3
Nandi	830						
Nandi Hills	831.3	Chemelil	1.3	1.8	2.7	3.4	4.2
Kaptumo	832.1	Kaptumo	0.0	0.0	0.4	0.5	0.5
Kapsabet(*)+Baraton	832.2	Chemundu	13.2	19.5	33.0	43.6	56.2
Kabunjoi	832.7	Maraba	0.0	0.0	0.6	0.7	0.8
Cheptarit	834.1	Kosirai	0.0	0.0	0.5	0.6	0.7
Kabiyet	834.3	Kabiyet	0.0	0.0	0.5	0.6	0.7
Olessos	835.2	Olessos	0.0	0.0	0.7	0.9	1.0
Samburu	840						
Maralal(*)	841.4	Maralal Urban	17.8	26.9	42.3	57.1	74.7
Wamba	842.4	Wamba	3.7	5.6	8.8	11.9	15.5
Baragoi	843.6	Elbarta	3.2	4.8	7.6	10.3	13.4
Turukana	850						
Lokitaung	852.3	Ngisiger	0.0	0.0	1.4	1.6	1.8
Kalokol	853.3	Kalokol	0.0	0.0	1.4	1.6	1.8
Lodwar(*)	853.5	Lodwar	9.3	12.2	21.3	26.6	33.4
Lokori	854.4	Lobokat	0.0	0.0	1.3	1.5	1.7
West Pokot	860						
Kapenguria(*)/Makutano	861.1	Kapenguria	12.0	17.6	27.9	37.1	48.1
Chepareria	862.1	Kipkomo	1.2	1.6	2.4	3.0	3.7
Sigor	863.1	Weiwei	0.0	0.0	0.3	0.4	0.5
Kacheliba(Kongelai)	865.1	Kiwawa	0.0	0.0	0.5	0.6	0.8
Bungoma	910						
Sirisia	911.3	Sirisia	1.1	1.8	2.5	3.2	3.9
Mwalie+Malakisi	911.4	Malakisi	2.6	4.2	7.0	8.7	10.7
Bungoma(*)	912.4	Kanduyi	29.5	52.7	83.0	110.1	142.7
Kimilili	913.1	Kimilili	6.5	11.6	18.3	24.3	31.4
Chwele	913.2	Bokoli	0.0	0.0	1.4	1.7	2.0
Webuye	914.2	Webuye	26.6	47.5	74.9	99.3	128.7
Tongaren	915.2	Ndalu	0.0	0.0	1.7	2.0	2.3
Chaptais	916.1	Chaptais	2.8	4.5	6.5	8.1	10.0
Kapsakwony	917.0	Elgon	0.7	1.1	1.6	2.0	2.5

(To be continued)

Talbe 4.1.2 Projected Urban Population by Town : 1990-2010 (7/7)

Town Name	Location of Town Centre		Projected Urban Population (1000)				
	Code	Location Name	1990	1995	2000	2005	2010
Busia	920						
Amagoro(Kocholia)	921.2	Central Teso	0.0	0.0	1.5	1.8	2.1
Busia(*)	922.3	West Bukhayo, etc.	13.3	23.3	41.4	54.6	70.1
Nambale	922.2	Central Bukhayo	2.1	3.3	5.3	6.6	8.0
Butula(Muandas)	922.4	Marachi East	0.0	0.0	1.3	1.5	1.8
Funyula(Nangina)	923.1	Samia North	0.0	0.0	1.3	1.6	1.8
Hakati	923.2	Samia South	0.0	0.0	1.0	1.2	1.4
Port Victoria	924.2	West Bunyala	0.0	0.0	0.6	0.7	0.9
Kakamega/Vihiga	930						
Ebusiratsi	931.1	North Bunyore	0.0	0.0	0.5	0.6	0.7
Luanda	931.3	West Bunyore	3.3	5.1	7.8	10.0	12.6
Hamisi	932.2	North Maragoli	0.0	0.0	0.6	0.6	0.7
Mbale+Chavakali	932.4	Esava	0.0	0.0	1.1	1.3	1.5
Vihiga+Majengo	932.5	Central Maragoli	4.5	6.4	9.9	12.0	14.4
Kaimosi	933.1	Shamakhokho	0.0	0.0	0.9	1.0	1.2
Khayega	934.3	West Isukha	0.0	0.0	1.0	1.1	1.3
Navakholo	935.1	Bunyala	0.0	0.0	0.7	0.8	0.9
Kakamega(*)	935.4	Kakamega Municipality	49.2	76.0	116.6	148.5	187.5
Malava	936.2	Central Kabras	0.0	0.0	1.4	1.6	1.8
Lumakanda	937.3	Lumakanda	0.0	0.0	1.1	1.2	1.4
Khwisero	938.2	Mundeku	0.0	0.0	0.8	0.9	1.0
Butere	939.2	Central Marama	2.5	3.5	5.0	6.1	7.3
Shianda	939.3	South Marama	0.0	0.0	0.7	0.8	0.9
Mumias	93A.4	Central Wanga	25.8	36.6	51.8	62.9	75.8

Remark : (*) means the administrative head-quarters of the District.

(**) means the administrative head-quarters of the Province.

Table 4.1.3 Projected GDP and GDP per Capita at 1989 Constant Prices : 1989-2010

Item	1989 Provisional	1990	1995	2000	2005	2010
I. GDP at 1988 Constant Prices (K.Pound Million)						
1. Non-Monetary Economy	389.0	402.6	478.2	568.0	636.8	713.9
2. Monetary Economy						
a. Agriculture	2,088.4	2,199.1	2,847.0	3,685.7	4,378.2	5,200.8
b. Manufacturing	855.4	919.5	1,320.1	1,895.1	2,413.9	3,074.6
c. Trade, Restaurants & Hotels	829.1	874.7	1,143.2	1,494.1	1,786.1	2,135.3
d. Government Services	1,077.9	1,136.1	1,477.8	1,922.3	2,290.8	2,729.9
e. Others	2,090.8	2,230.8	3,085.3	4,266.9	5,299.3	6,581.4
Total of Monetary Economy	6,941.5	7,360.2	9,873.3	13,264.1	16,168.2	19,721.9
3. Total GDP at Factor Cost	7,330.5	7,762.8	10,351.5	13,832.1	16,805.0	20,435.8
a. GDP by Urban Sector	4,205.5	4,632.5	6,319.7	8,639.2	10,629.9	13,126.4
b. GDP by Rural Sector	3,125.0	3,130.4	4,031.8	5,192.9	6,175.1	7,309.4
		1.10	1.36	1.37	1.23	1.23
Percentage Distribution (%)						
1. Non-Monetary Economy	5.3	5.2	4.6	4.1	3.8	3.5
2. Monetary Economy						
a. Agriculture	28.5	28.3	27.5	26.6	26.1	25.4
b. Manufacturing	11.7	11.8	12.8	13.7	14.4	15.0
c. Trade, Restaurants & Hotels	11.3	11.3	11.0	10.8	10.6	10.4
d. Government Services	14.7	14.6	14.3	13.9	13.6	13.4
e. Others	28.5	28.7	29.8	30.8	31.5	32.2
Total of Monetary Economy	94.7	94.8	95.4	95.9	96.2	96.5
3. Total GDP at Factor Cost	100.0	100.0	100.0	100.0	100.0	100.0
a. GDP by Urban Sector	57.4	59.7	61.1	62.5	63.3	64.2
b. GDP by Rural Sector	42.6	40.3	38.9	37.5	36.7	35.8
II. GDP per Capita						
1. GDP per Capita (K.Pound)	333.2	341.2	391.8	448.4	475.9	505.8
-ditto-*2	(342.6)					
a. Urban Sector	1,089.7	1,168.3	1,145.9	1,089.0	1,055.2	1,033.7
-ditto-*2	(1,125.7)					
b. Rural Sector	172.3	166.7	193.1	228.0	245.7	264.8
-ditto-*2	(176.9)					
GDP per Capita (US\$)*1	308.5	316.0	362.8	415.2	440.6	468.3
a. Urban Sector	1,008.9	1,081.7	1,061.0	1,008.3	977.0	957.1
b. Rural Sector	159.5	154.3	178.8	211.1	227.5	245.1
2. Projected Population (1000)*3	22,000	22,749	26,389	30,712	35,209	40,305
-ditto-*2	(21,397)					
a. Urban Population*3	3,859	3,965	5,515	7,933	10,074	12,698
-ditto-*2	(3,736)					
b. Rural Population*3	18,141	18,784	20,874	22,779	25,135	27,607
-ditto-*2	(17,661)					

Source : A.01, A.13 and A.24

Remark : *1 Foreign exchange rate : KShs21.6/US\$ (as of December, 1989)

*2 In case that the final figures are the same as the provisional results of the 1989 census.

*3 The final figures of the total population are assumed to be 22 million in the 1989 census.

**Table 4.1.4 Target Production of Food Products and Cash Crops
(1990 - 2010)**

Item	Per Capita Consumption *1		Year			
	Urban	Rural	1984	1990	2000	2010
1. Population (1000)						
Urban	-	-		3,965	7,933	12,698
Rural	-	-		18,784	22,779	27,607
Total	-	-		22,749	30,712	40,305
2. Food Products (1000 metric tonnes)						
Maize	97.1	125.6		2,744	3,631	4,700
Wheat	24.7	10.0		286	424	590
Millet/Sorghum	0.0	19.8		372	451	547
Rice	13.1	1.4		78	136	205
Potatoes	14.8	26.2		551	714	911
Other roots	3.0	30.5		585	719	880
Sugar	30.0	15.0		401	580	795
Pulses	13.8	14.2		321	433	567
Milk	88.6	72.1		1,706	2,345	3,116
Beef	11.9	6.8		175	249	339
Fat	6.5	1.7		58	90	129
Vegetables	36.8	20.4		529	757	1,030
Fish	1.9	1.7		39	54	71
3. Cash Crops (1000 metric tonnes)						
Coffee			115	175	354	603
Tea			117	158	262	366
Horticultural Crops			809	1,173	2,180	3,410

Remark : *1 Data provided by Crop Development Division of MOA.
Refer to Table A2.15 in Sectoral Report A "Socio-Economy".

Table 4.1.5 District Distribution of Value Added by Manufacturing Industry at 1988 Constant Prices : 1988-2010

(Unit : million KShs.)

Code District	1988	1990	1995	2000	2005	2010
110 Nairobi	7,547.2	8,721.5	12,521.8	17,977.5	22,896.9	29,163.4
210 Kiambu	699.6	808.6	1,161.1	1,666.5	2,122.7	2,703.7
220 Kirinyaga	73.5	84.7	121.7	174.7	222.6	283.6
230 Murang'a	77.0	89.0	127.8	183.5	233.7	297.6
240 Nyandarua	69.5	80.5	115.3	165.6	211.0	268.6
250 Nyeri	361.6	417.9	600.0	861.2	1,097.1	1,397.3
310 Kilifi	184.9	213.8	306.7	440.2	560.8	714.5
320 Kwale	29.6	34.1	48.8	70.1	89.4	114.0
330 Lamu	56.7	65.6	94.2	135.2	172.2	219.3
340 Mombasa	1,713.5	1,980.2	2,842.8	4,081.5	5,198.6	6,621.2
350 Taita Taveta	118.1	136.7	196.1	281.4	358.6	456.6
360 Tana River	13.6	15.6	22.5	32.3	41.1	52.4
410 Embu	75.8	87.5	125.8	180.4	229.9	292.8
420 Isiolo	29.5	34.0	48.9	70.2	89.4	113.9
430 Kitui	27.1	31.3	45.0	64.6	82.2	104.8
440 Machakos/Makueni	392.2	453.1	650.4	933.7	1,189.4	1,515.1
450 Marsabit	86.3	99.7	143.0	205.4	261.6	333.2
460 Meru	252.7	292.0	419.2	601.8	766.6	976.5
510 Garissa	17.7	20.4	29.2	42.0	53.5	68.2
520 Mandera	28.4	32.8	47.1	67.6	86.1	109.7
530 Wajir	0.0	0.0	0.0	0.0	0.0	0.0
610 Kisii/Nyamira	233.7	270.0	387.5	556.4	708.7	902.8
620 Kisumu	643.3	743.3	1,067.2	1,532.3	1,951.4	2,485.7
630 Siaya	184.8	213.7	306.7	440.2	560.7	714.3
640 South Nyanza	333.8	385.8	553.7	795.1	1,012.6	1,289.9
710 Kajiado	7.6	8.8	12.6	18.1	23.0	29.3
720 Kericho	400.6	463.0	664.8	954.4	1,215.5	1,548.3
730 Laikipia	193.3	223.3	320.8	460.4	586.5	747.0
740 Nakuru	765.4	884.5	1,269.9	1,823.1	2,322.1	2,957.3
750 Narok	37.7	43.8	62.9	90.2	114.8	146.2
760 Trans Nzoia	166.9	192.8	276.7	397.3	506.0	644.6
770 Uasin Gishu	343.7	397.2	570.2	818.6	1,042.7	1,328.1
810 Baringo	32.0	36.9	52.9	76.0	96.9	123.4
820 Elgeyo Marakwet	15.0	17.3	24.7	35.5	45.2	57.6
830 Nandi	143.0	165.2	237.2	340.6	433.8	552.5
840 Samburu	37.0	42.8	61.4	88.2	112.4	143.2
850 Turkana	56.8	65.6	94.1	135.1	172.2	219.3
860 West Pokot	9.5	10.9	15.7	22.5	28.7	36.6
910 Bungoma	158.9	183.7	263.5	378.2	481.9	614.1
920 Busia	38.7	44.8	64.3	92.1	117.5	149.7
930 Kakamega/Vihiga	266.6	308.3	442.6	635.3	809.1	1,030.6
000 Unidentified	28.4	32.8	47.1	67.6	86.1	109.7
Total	15,951.2	18,433.6	26,463.8	37,992.2	48,391.0	61,636.1
Total in K. Pound Million	797.6	921.7	1,323.2	1,899.6	2,419.6	3,081.8

Table 4.1.6 Trend of Projected Public Expenditure for Development up to 2010

(Unit : K.Pound Million)

Item	1989 Provisional	1990 1990/91	1995 1995/96	2000 2000/01	2005 2005/06	2010 2010/11
1. GDP at 1989 Constant Prices *1 (at Factor Cost)	7,330.5	7,762.8	10,351.5	13,832.1	16,805.0	20,435.8
2. Total Expend. by National Government	3,522.7	3,700.4	4,742.8	6,100.0	7,411.0	9,012.2
1) Recurrent Expenditure	2,516.2	2,653.8	3,463.4	4,520.1	5,491.6	6,678.0
2) Development Expenditure	1,006.5	1,046.5	1,279.4	1,579.9	1,919.5	2,334.2
a) Appropriations-in-Aid	548.9	560.2	620.5	687.3	835.0	1,015.4
b) Net Expenditure	457.7	486.3	658.9	892.6	1,084.5	1,318.8
3. Capital Expenditure	665.9	678.3	743.6	815.2	990.4	1,204.4
a) Gross Fixed Capital Formation	603.4	613.5	666.3	723.6	879.1	1,069.0
4. Expenditure for Projects Related to Water Development	225.4	232.8	273.7	322.3	391.6	476.2
a) Expenditure by MOWD	75.2	78.5	96.9	119.6	145.3	176.7
b) Expend. by Agencies Concerned	150.1	154.3	176.9	202.7	246.3	299.5
5. Accumulation of Expenditure for Projects Related to Water Development after 1992	-	-	1,284.0	2,795.0	4,608.9	6,813.9
a) Expenditure by MOWD	-	-	446.0	996.5	1,669.5	2,487.6
b) Expend. by Agencies Concerned	-	-	838.0	1,798.5	2,939.4	4,326.4
Equivalent in US\$ (US\$ Million) *2						
Total Expenditure Accumulation	-	-	1,188.8	2,587.8	4,267.3	6,308.9
a) Expenditure by MOWD	-	-	412.9	922.7	1,545.8	2,303.2
b) Expend. by Agencies Concerned	-	-	775.9	1,665.2	2,721.5	4,005.7

Source : A.01, A.13 and A.24

Remark : *1 Refer to Table 4.1.3.

*2 Foreign exchange rate : KShs21.6/US\$ (as of December, 1989)

Table 4.2.1 Connection Rate by Service Type

(Unit: %)

	Individual connection Rate			Non-Individual connection Rate		
	Initial	Future	Ultimate	Initial	Future	Ultimate
URBAN AREA						
High and Medium Class Housing	100	100	100	0	0	0
Low Class Housing	10	30	50	90	70	50
RURAL AREA						
High Potential	20	40	80	80	60	20
Medium Potential	10	20	40	90	80	60
Low Potential	5	10	20	95	90	80

Source: Design Manual Table 4.1

Table 4.2.2 Unit Consumption Rate

Consumer	Unit	Rural Areas			Urban Areas			
		High Potential	Medium Potential	Low Potential	High Class Housing	Medium Class Housing	Low Class Housing	
People w/ IC	l/c/d	60	50	40	250	150	75	
People w/o IC	l/c/d	20	15	10	—	—	20	
Livestock Unit	l/LU/d	50	50	50				
Boarding Schools	l/c/d	50	50	50	50	50	50	
Day Schools w/ WC	l/c/d	25	25	25	25	25	25	
Day Schools w/o WC	l/c/d	5	5	5	5	5	5	
Hospitals								
Regional	l/bed/d	400						
District	l/bed/d	200	plus 20 litre per outpatient per day (minimum 5,000 l/day)					
Others	l/bed/d	100						
Dispensary and Health Centre	l/d	5,000	5,000	5,000	5,000	5,000	5,000	
Hotels								
High Class	l/bed/d	600	600	600	600	600	600	
Medium Class	l/bed/d	300	300	300	300	300	300	
Low Class	l/bed/d	50	50	50	50	50	50	
Administrative Offices	l/c/d	25	25	25	25	25	25	
Bars	l/d	500	500	500	500	500	500	
Shops	l/d	100	100	100	100	100	100	
Unspecified Industry	l/ha/d	20,000	20,000	20,000	20,000	20,000	20,000	
Coffee Pulping Factories	l/kg coffee	25	25	25	25	25	25	

Source : Design Manual, MOWD

Table 4.2.3 Unit Water Consumption Rate by Industrial Type : 1989 - 2010

Item	Food Beverages & Tobacco	Textile Apparel & Leather	Wood & Wood Products	Paper Products & Printing	Chemicals & Petroleum Products	Non-metallic Mineral Products	Basic Metal Industries	Machinery & Equipment	Others	Manufacturing Industry
1. Value Added in 1988 (K.Pound 1000)	321,164	81,511	22,892	61,902	132,129	37,175	47,438	76,372	16,978	797,561
2. Total Units of Manufacturing Establishments (Nos)	678	398	442	283	211	98	19	304	94	2,527
3. Value Added per Establishment (KShs 1000)	9,474	4,096	1,084	4,374	12,524	7,586	49,934	5,024	3,612	6,312
4. Unit Water Consumption Rate per Value Added (c.m./day/KShs.billion(at 1989 prices*1))	5,617	8,443	732	19,471	26,521	8,561	51,738	3,654	1,360	13,015
5. Unit Water Replenishment (Raw Water) Rate per Value Added (c.m./day/KShs.billion(at 1989 prices*1))	3,300	6,794	655	11,394	5,295	2,327	6,211	698	568	3,287
6. Unit Water Replenishment Rate in the Projection (c.m./day/KShs.billion(at 1989 prices*1))										
a. 1989 *2	5,617	8,443	732	19,471	26,521	8,561	51,738	3,654	1,360	13,015
b. 1990	5,562	8,404	730	19,279	26,015	8,413	50,654	3,584	1,341	12,784
c. 1995	5,286	8,207	721	18,317	23,489	7,671	45,234	3,232	1,247	11,626
d. 2000	5,010	8,011	712	17,356	20,962	6,928	39,814	2,880	1,153	10,468
e. 2005	4,734	7,815	703	16,394	18,435	6,186	34,394	2,528	1,058	9,309
f. 2010 *2	4,459	7,618	694	15,433	15,908	5,444	28,974	2,176	964	8,151
REFERENCE : Unit Rates for Industrial Development in Japan (1986)	7,479	7,460	2,303	4,582	5,847	2,898	2,206	24,312	1,262	58,349
1. Number of Samples										
2. Unit per Firm										
Employees	97	80	72	98	129	88	197	151	86	122
Production (Million Yen)	3,116	931	1,397	2,757	5,956	1,916	8,192	4,248	1,994	3,605
Value Added (Million Yen)	903	350	511	1,146	2,178	893	2,294	1,368	774	1,195
Yard Area(sq.m.)	14,048	9,391	16,721	13,526	46,430	35,927	103,232	18,025	9,360	22,776
Water Consumption (c.u.m./day)	762	444	56	3,351	8,674	1,148	17,823	751	158	2,336
Water Replenishment (c.u.m./day)	448	357	50	1,961	1,732	312	2,140	143	66	590
3. Water Recovery Rate (%)	41	20	11	42	80	73	88	81	58	75
4. Drained-to-Replenished Rate (%)	36	38	51	84	7	22	9	29	16	21
5. Unit Rates (c.u.m./day/KShs.billion(at 1989 prices))*3										
Water Consumption per Production	1,628	3,177	268	8,094	9,700	3,991	14,491	1,177	528	4,316
Water Consumption per Value Added	5,617	8,443	732	19,471	26,521	8,561	51,738	3,654	1,360	13,015
Water Consumption per Yard Area (c.u.m./day/ha)	542	473	34	2,477	1,868	320	1,727	416	169	1,026
Water Replenishment per Production	957	2,556	240	4,737	1,937	1,085	1,740	225	220	1,090
Water Replenishment per Value Added	3,300	6,794	655	11,394	5,295	2,327	6,211	698	568	3,287

Remark : *1 Refer to the below REFERENCE

*2 Whole water consumed in processing is assumed to be supplied by a water supply system. However, a water recirculation system will be introduced into the manufacturing process, though its recirculation rate is assumed to be a half of volume mentioned in Row 3 by the year 2010.

*3 To convert the 1986 value to the 1989 value in Japan, the overall wholesale price index of manufacturing industry products was applied, which was 0.994 between the years. The foreign exchange rate in 1989 was KShs. 21.6/US\$ and JY143/US\$.

Table 4.2.4 District Distribution of Industrial Water Requirement : 1989-2010

(Unit : cu.m./day)

Code District	1989	1990	1995	2000	2005	2010
110 Nairobi	120,813	128,300	167,417	218,953	249,690	281,668
210 Kiambu	8,843	9,405	12,382	16,362	18,893	21,649
220 Kirinyaga	426	457	624	857	1,039	1,258
230 Murang'a	629	673	915	1,257	1,519	1,833
240 Nyandarua	361	386	524	720	866	1,045
250 Nyeri	2,361	2,521	3,380	4,570	5,417	6,407
310 Kilifi	3,493	3,705	4,794	6,206	6,989	7,762
320 Kwale	160	172	232	317	380	459
330 Lamu	319	341	463	632	759	910
340 Mombasa	28,982	30,768	40,072	52,286	59,458	66,834
350 Taita Taveta	1,052	1,122	1,505	2,033	2,408	2,845
360 Tana River	88	94	129	178	217	264
410 Embu	455	488	659	900	1,078	1,290
420 Isiolo	160	172	233	318	382	458
430 Kitui	176	188	258	356	433	527
440 Machakos	2,880	3,072	4,107	5,525	6,515	7,659
450 Marsabit	480	513	695	950	1,141	1,368
460 Meru	1,530	1,637	2,216	3,024	3,627	4,346
510 Garissa	122	131	181	251	307	376
520 Mandera	160	171	231	316	379	455
530 Wajir	0	0	0	0	0	0
610 Kisii	1,446	1,547	2,093	2,855	3,422	4,100
620 Kisumu	5,516	5,880	7,824	10,472	12,278	14,329
630 Siaya	1,059	1,134	1,533	2,091	2,504	2,998
640 South Nyanza	1,977	2,114	2,862	3,910	4,690	5,625
710 Kajiado	65	69	90	117	132	148
720 Kericho	2,378	2,541	3,437	4,685	5,606	6,702
730 Laikipia	1,143	1,223	1,662	2,278	2,744	3,303
740 Nakuru	9,341	9,922	12,969	16,996	19,429	21,989
750 Narok	212	228	308	422	506	606
760 Trans Nzoia	1,046	1,119	1,519	2,080	2,502	3,009
770 Uasin Gishu	3,313	3,530	4,689	6,267	7,333	8,541
810 Baringo	116	125	169	232	278	336
820 Elgeyo Marakwet	58	62	82	114	136	166
830 Nandi	799	855	1,157	1,581	1,899	2,278
840 Samburu	225	241	322	434	513	606
850 Turkana	319	342	463	632	758	910
860 West Pokot	53	57	77	105	126	152
910 Bungoma	1,282	1,370	1,832	2,468	2,916	3,440
920 Busia	231	247	337	465	564	685
930 Kakamega	1,651	1,767	2,388	3,258	3,899	4,663
000 Unidentified	160	171	231	316	379	455
Total	205,880	218,860	287,061	377,789	434,111	494,454

Table 4.2.5 Domestic and Industrial Water Demand in 1990

District Code	District Name	Population		Rural Demand			Urban Demand			Livestock		Industrial		Total Demand (m ³ /d)	Per Capita (l/d/c)
		Rural (nos)	Urban (nos)	Residence (m ³ /d)	Non-residence (m ³ /d)	Total (m ³ /d)	Residence (m ³ /d)	Non-residence (m ³ /d)	Total (m ³ /d)	Water (m ³ /d)	Water (m ³ /d)	Water (m ³ /d)			
110	Nairobi	0	1,413,100	0	0	0	175,048	29,286	204,334	192	128,300	332,826	236		
210	Kiambu	866,410	105,500	20,546	7,191	27,737	13,069	2,186	15,255	4,827	9,405	57,224	59		
220	Kimiyaga	393,482	19,400	8,571	3,264	11,835	2,403	402	2,805	2,764	457	17,861	43		
230	Murang'a	833,776	65,000	19,866	6,922	26,788	8,052	1,348	9,400	4,709	673	41,570	46		
240	Nyandarua	366,106	11,900	7,605	3,041	10,646	1,474	246	1,720	7,716	386	20,468	54		
250	Nyeri	540,096	107,200	13,540	4,484	18,024	13,279	2,221	15,500	3,916	2,521	39,961	62		
310	Kilifi	592,003	62,100	7,486	4,913	12,399	7,693	1,288	8,981	2,821	3,705	27,906	43		
320	Kwale	394,205	14,700	5,934	3,273	9,207	1,821	305	2,126	5,019	172	16,524	40		
330	Lamu	48,236	12,300	629	399	1,028	1,524	255	1,779	1,088	341	4,236	70		
340	Mombasa	0	479,600	0	0	0	59,410	9,940	69,350	138	30,768	100,256	209		
350	Taita Taveta	188,200	27,000	2,240	1,562	3,802	3,345	560	3,905	3,768	1,122	12,597	59		
360	Tana River	126,203	11,700	1,480	1,049	2,529	1,449	243	1,692	6,966	94	11,281	82		
410	Embu	361,491	20,400	7,020	3,000	10,020	2,527	422	2,949	2,655	488	16,112	42		
420	Isiolo	46,886	27,896	539	389	928	3,456	578	4,034	7,465	172	12,599	168		
430	Kitui	667,267	16,600	7,675	5,539	13,214	2,056	344	2,400	7,895	188	23,697	35		
440	Machakos/Makueni	1,320,332	165,900	17,773	10,957	28,730	20,551	3,439	23,990	9,330	3,072	65,122	44		
450	Marsabit	104,305	33,800	1,202	867	2,069	4,187	701	4,888	14,932	513	22,402	162		
460	Meru	1,121,545	91,900	19,651	9,311	28,962	11,384	1,905	13,289	12,751	1,637	56,639	47		
510	Garissa	94,691	32,500	1,088	787	1,875	4,026	674	4,700	7,399	131	14,105	111		
520	Mandera	105,694	21,649	1,216	877	2,093	2,682	450	3,132	7,603	171	12,999	102		
530	Wajir	95,602	30,378	1,099	793	1,892	3,763	630	4,393	6,424	0	12,709	101		
610	Kisii/Nyamira	1,142,173	59,700	31,092	9,481	40,573	7,395	1,237	8,632	11,536	1,547	62,288	52		
620	Kisumu	498,124	210,100	10,538	4,135	14,673	26,026	4,354	30,380	6,351	5,880	57,284	81		
630	Siaya	649,980	26,800	15,731	5,393	21,124	3,320	556	3,876	7,925	1,134	34,059	50		
640	South_Nyanza	1,104,838	50,100	22,868	9,166	32,034	6,206	1,039	7,245	5,542	2,114	46,935	41		
710	Kajiado	252,370	34,000	3,046	2,094	5,140	4,212	704	4,916	18,521	69	28,646	100		
720	Kencho	862,960	52,600	21,730	7,162	28,892	6,516	1,090	7,606	17,426	2,541	56,465	62		
730	Lakipia	186,499	41,700	2,576	1,546	4,122	5,166	864	6,030	8,000	1,223	19,375	85		
740	Nakuru	675,156	257,700	13,394	5,605	18,999	31,923	5,342	37,265	13,795	9,922	79,981	86		
750	Narok	407,099	17,500	7,339	3,376	10,715	2,168	362	2,530	32,127	228	45,600	107		
760	Trans_Nzoia	367,719	56,400	6,524	3,052	9,576	6,987	1,168	8,155	4,728	1,119	23,578	56		
770	Uasin_Gishu	346,725	123,600	6,794	2,878	9,672	15,311	2,562	17,873	7,770	3,530	38,845	83		
810	Baringo	279,859	26,100	4,092	2,324	6,416	3,233	541	3,774	6,664	125	16,979	55		
820	Elg_Marakwet	221,191	6,100	4,246	1,835	6,081	756	126	882	6,382	62	13,407	59		
830	Nandi	458,824	14,500	10,474	3,808	14,282	1,796	301	2,097	9,044	855	26,278	56		
840	Samburu	97,567	24,700	1,190	811	2,001	3,060	512	3,572	6,485	241	12,299	101		
850	Turkana	180,132	9,295	2,072	1,495	3,567	1,151	193	1,344	20,452	342	25,705	136		
860	West_Pokot	234,901	13,200	3,176	1,948	5,124	1,635	274	1,909	4,219	57	11,309	46		
910	Bungoma	719,267	69,800	17,206	5,970	23,176	8,646	1,447	10,093	6,645	1,370	41,284	52		
920	Busia	438,219	15,400	10,745	3,636	14,381	1,908	320	2,228	3,725	247	20,581	45		
930	Kakamega/Vhiga	1,393,871	85,300	36,189	11,574	47,763	10,567	1,768	12,335	8,992	1,767	70,857	48		
TOTAL		18,784,004	3,965,118	376,182	152,907	532,089	491,179	82,183	573,362	326,707	218,689	1,650,847	73		

Table 4.2.6 Domestic and Industrial Water Demand in 2000

District Code	District Name	Population		Rural Demand			Urban Demand			Livestock		Industrial		Total Demand (m ³ /d)	Per Capita (l/d/c)
		Rural (nos)	Urban (nos)	Residence (m ³ /d)	Non-residence (m ³ /d)	Total (m ³ /d)	Residence (m ³ /d)	Non-residence (m ³ /d)	Total (m ³ /d)	Water (m ³ /d)	Total (m ³ /d)				
110	Nairobi	0	2,260,469	0	0	0	286,232	46,848	333,080	257	218,953	552,290	244		
210	Kiambu	1,006,986	241,538	30,009	8,358	38,367	30,585	5,005	35,590	5,669	16,362	95,988	77		
220	Kirinyaga	474,035	45,346	12,882	3,934	16,816	5,742	940	3,355	857	27,710	53			
230	Murang'a	958,614	128,588	28,781	7,958	36,739	16,282	2,664	18,946	5,334	1,257	62,276	57		
240	Nyandarua	485,561	32,048	12,473	4,030	16,503	4,058	666	4,724	10,476	720	32,423	63		
250	Nyeri	560,679	242,904	17,832	4,656	22,488	30,758	5,034	35,792	4,427	4,570	67,277	84		
310	Kiufi	737,699	159,473	10,666	6,118	16,784	20,193	3,304	23,497	3,443	6,206	49,930	56		
320	Kwale	480,292	42,861	8,438	3,987	12,425	5,427	887	6,314	5,725	317	24,781	47		
330	Lamu	58,510	27,775	879	486	1,365	3,517	575	4,092	1,478	632	7,567	88		
340	Mombasa	0	672,934	0	0	0	85,210	13,947	99,157	182	52,286	151,625	225		
350	Taita_Taveta	216,380	49,317	2,927	1,797	4,724	6,245	1,022	7,267	4,238	2,033	18,262	69		
360	Tana_River	153,009	33,071	2,033	1,270	3,303	4,188	685	4,873	7,632	178	15,986	86		
410	Embu	450,242	50,337	10,755	3,736	14,491	6,399	1,047	7,446	3,159	900	25,996	52		
420	Isiolo	50,343	79,153	655	418	1,073	10,023	1,641	11,664	11,386	318	24,441	189		
430	Kiui	838,429	46,271	10,899	6,960	17,859	5,859	958	6,817	9,301	356	34,333	39		
440	Machakos/Makueni	1,590,616	394,597	24,801	13,199	38,000	49,966	8,178	58,144	10,981	5,525	112,650	57		
450	Marsabit	117,172	79,213	1,530	974	2,504	10,030	1,642	11,672	19,020	950	34,146	174		
460	Meru	1,403,040	229,484	29,886	11,646	41,332	29,058	4,757	33,815	15,796	3,024	93,967	58		
510	Garissa	98,793	95,644	1,284	820	2,104	12,111	1,982	14,093	8,540	251	24,988	129		
520	Mandera	117,390	37,193	1,527	974	2,501	4,710	770	5,480	10,074	316	18,371	119		
530	Wajir	101,797	62,996	1,324	845	2,169	7,977	1,305	9,282	6,920	0	18,371	111		
610	Kisii/Nyamira	1,274,837	126,125	44,434	10,582	55,016	15,971	2,614	18,585	12,712	2,855	89,168	64		
620	Kisumu	536,505	434,392	14,033	4,454	18,487	55,005	9,005	64,010	8,454	10,472	101,423	104		
630	Siaya	738,498	50,485	22,551	6,130	28,681	6,393	1,046	7,439	8,560	2,091	46,871	59		
640	South_Nyanza	1,250,972	106,051	31,873	10,381	42,254	13,429	2,199	15,628	6,115	3,910	67,907	50		
710	Kajiado	362,989	98,051	4,989	3,013	8,002	12,416	2,032	14,448	24,061	117	46,628	101		
720	Kenicho	1,069,063	118,460	34,151	8,873	43,024	15,000	2,455	17,455	22,142	4,685	87,306	74		
730	Laikipia	253,030	104,603	4,071	2,102	6,173	13,245	2,167	15,412	11,662	2,278	35,525	99		
740	Nakuru	839,543	704,789	20,506	6,969	27,475	89,244	14,607	103,851	21,379	16,996	169,701	110		
750	Narok	644,338	58,084	14,124	5,348	19,472	7,355	1,204	8,559	44,700	422	73,153	104		
760	Trans_Nzoia	465,648	150,010	10,031	3,863	13,894	18,995	3,110	22,105	5,728	2,080	43,807	71		
770	Uasin_Gishu	369,012	297,004	8,814	3,064	11,878	37,608	6,155	43,763	9,435	6,267	71,343	107		
810	Baringo	348,224	56,908	6,008	2,893	8,901	7,206	1,181	8,387	7,858	232	25,378	63		
820	Elg_Marakwet	287,019	13,612	6,794	2,383	9,177	1,724	281	2,005	10,558	114	21,854	73		
830	Nandi	599,437	38,483	17,119	4,972	22,091	4,873	798	5,671	11,058	1,581	40,401	63		
840	Samburu	121,513	58,670	1,693	1,008	2,701	7,429	1,216	8,645	9,472	434	21,252	118		
850	Turkana	213,521	25,313	2,776	1,774	4,550	3,205	525	3,730	36,286	632	45,198	189		
860	West_Pokot	298,923	31,163	4,715	2,479	7,194	3,946	646	4,592	4,466	105	16,357	50		
910	Bungoma	933,305	196,960	28,128	7,746	35,874	24,940	4,082	29,022	8,482	2,468	75,846	67		
920	Busia	586,867	52,499	18,149	4,870	23,019	6,648	1,087	7,735	5,107	465	36,326	57		
930	Kakamega/Vihiga	1,686,652	199,749	55,909	13,999	69,908	25,293	4,140	29,433	10,770	3,258	113,369	60		
TOTAL		22,779,483	7,932,823	560,249	189,069	749,318	1,004,494	164,407	1,168,901	426,498	377,473	2,722,190	89		

Table 4.2.7 Domestic and Industrial Water Demand in 2010

District Code Name	Population		Rural Demand			Urban Demand			Livestock		Industrial		Total Demand (m3/d)	Per Capita (l/d/c)
	Rural (nos)	Urban (nos)	Residence Non-residence (m3/d)	Total (m3/d)	Residence Non-residence (m3/d)	Total (m3/d)	Water (m3/d)	Total (m3/d)	Water (m3/d)	Total (m3/d)	Water (m3/d)	Total (m3/d)		
110 Nairobi	0	3,465,334	0	0	448,328	71,819	520,147	345	281,668	802,160	231			
210 Kiambu	1,206,609	376,086	50,652	10,015	60,667	7,794	56,450	7,144	21,649	145,910	92			
220 Kirinyaga	559,419	73,805	21,232	4,643	25,875	1,529	11,078	4,152	1,258	42,363	67			
230 Murang'a	1,126,289	189,296	47,786	9,348	57,134	3,923	28,413	6,424	1,833	93,804	71			
240 Nyandarua	584,678	50,212	20,763	4,851	25,614	1,041	7,537	13,338	1,045	47,534	75			
250 Nyeri	672,814	411,536	30,458	5,583	36,041	8,529	61,771	5,989	6,407	110,208	102			
310 Kihifi	896,608	269,640	16,239	7,442	23,681	5,587	40,472	4,275	7,762	76,190	65			
320 Kwale	566,803	65,482	12,810	4,706	17,516	1,557	9,829	6,528	459	34,332	54			
330 Lamu	73,771	46,331	1,394	613	2,007	961	6,955	3,069	910	12,941	108			
340 Mombasa	0	904,362	0	0	117,002	18,743	135,745	239	66,834	202,818	224			
350 Taita_Taveta	258,638	72,726	4,333	2,147	6,480	1,508	10,917	5,105	2,845	25,347	76			
360 Tana_River	184,242	51,170	3,022	1,529	4,551	1,061	7,681	8,506	264	21,002	89			
410 Embu	537,380	81,776	17,632	4,462	22,094	1,695	12,275	3,779	1,290	39,438	64			
420 Isiolo	74,480	136,067	1,191	618	1,809	2,819	20,423	25,802	458	48,492	230			
430 Kitui	992,858	76,589	15,888	8,241	24,129	1,588	11,497	10,738	527	46,891	44			
440 Machakos/Makueni	1,924,742	652,477	38,231	15,974	54,205	13,522	97,936	13,632	7,659	173,432	67			
450 Marsabit	147,232	123,037	2,364	1,223	3,587	2,550	18,468	34,373	1,368	57,796	214			
460 Meru	1,691,115	375,576	48,087	14,037	62,124	7,784	56,374	19,739	4,346	142,583	69			
510 Garissa	126,773	144,916	2,028	1,052	3,080	3,003	21,752	13,287	376	38,495	142			
520 Mandera	141,839	53,955	2,270	1,177	3,447	1,118	8,098	14,852	455	26,852	137			
530 Wajir	128,101	100,618	2,048	1,061	3,109	2,085	15,102	9,441	0	27,652	121			
610 Kisii/Nyamira	1,472,952	189,405	73,826	12,224	86,050	3,925	28,429	15,071	4,100	133,650	80			
620 Kisumu	692,149	689,399	25,024	5,744	30,768	14,289	103,480	13,886	14,329	162,463	118			
630 Siaya	853,688	76,041	36,874	7,086	43,960	1,576	11,414	10,034	2,998	68,406	74			
640 South_Nyanza	1,447,519	156,300	50,714	12,014	62,728	3,240	23,461	7,134	5,625	98,948	62			
710 Kajiado	468,513	183,374	7,999	3,889	11,888	3,801	27,525	30,142	148	69,703	107			
720 Kericho	1,276,594	189,948	58,057	10,595	68,652	3,935	28,510	28,253	6,702	132,117	90			
730 Laikipia	329,791	185,586	6,800	2,736	9,536	3,847	27,857	21,555	3,303	62,251	121			
740 Nakuru	1,159,323	1,304,983	38,952	9,622	48,574	27,047	195,879	52,317	21,989	318,759	129			
750 Narok	840,605	112,613	24,950	6,979	31,929	2,334	16,903	54,809	606	104,247	109			
760 Trans_Nzoia	582,258	260,000	16,974	4,833	21,807	5,389	39,027	7,574	3,009	71,417	85			
770 Uasin_Gishu	484,246	525,439	15,724	4,019	19,743	10,890	78,869	15,030	8,541	122,183	121			
810 Baringo	421,170	94,851	9,486	3,496	12,982	1,965	14,236	9,476	336	37,030	72			
820 Elg_Marakwet	342,735	20,480	11,190	2,846	14,036	424	3,074	16,625	166	33,901	93			
830 Nandi	719,677	64,159	28,819	5,975	34,794	1,330	9,631	12,929	2,278	59,632	76			
840 Samburu	156,610	103,710	2,724	1,301	4,025	2,149	15,566	14,626	606	34,823	134			
850 Turkana	251,488	38,657	4,025	2,087	6,112	801	5,802	66,113	910	78,937	272			
860 West_Pokot	359,414	53,031	7,292	2,983	10,275	1,100	7,961	4,694	152	23,082	56			
910 Bungoma	1,142,153	334,193	48,619	9,480	58,099	6,927	50,163	10,674	3,440	122,376	83			
920 Busia	710,487	86,124	31,071	5,896	36,967	1,785	12,927	6,548	685	57,127	72			
930 Kakamega/Vihiga	2,001,252	399,108	95,083	16,613	111,696	6,405	46,396	13,115	4,663	175,870	76			
TOTAL	27,607,015	12,698,392	932,631	229,140	1,161,771	263,175	1,906,029	621,362	493,999	4,183,161	104			

Table 4.3.1 Area and Number of Planned Irrigation Schemes by District

Code	District	Small Holder/GOK Managed Schemes	
		Number (nos.)	Area (ha)
110	Nairobi		
210	Kiambu	7	115
220	Kirinyaga	3	2,930
230	Murang'a	8	500
240	Nyandarua	1	0
250	Nyeri	6	77
310	Kilifi	10	3,330
320	Kwale	6	498
330	Lamu	5	0
340	Mombasa		
350	Taita Taveta	5	4,140
360	Tana River	12	12,540
410	Embu	23	3,309
420	Isiolo	1	50
430	Kitui	9	155
440	Machakos	6	17,505
450	Marsabit		
460	Meru	12	4,570
510	Garissa	3	46
520	Mandera		
530	Wajir		
610	Kisii		
620	Kisumu	3	26,150
630	Siaya	4	10,480
640	South Nyanza	3	4,100
710	Kajiado	3	10,000
720	Kericho	4	407
730	Laikipia		
740	Nakuru		
750	Narok		
760	Trans Nzoia		
770	Uasin Gishu	2	335
810	Baringo	5	31
820	Elg. Marakwet	1	1,340
830	Nandi		
840	Samburu	1	20
850	Turkana	2	600
860	West Pokot	4	48
910	Bungoma	3	7,705
920	Busia	6	7,353
930	Kakamega	1	3
Total		159	118,337

Source : Ref. E.23, E.37

Table 4.3.2 Future Irrigation Water Demand (1/5)

Drainage Area 1

Unit : m3/sec

Basin	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1AA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1AB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1AC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1AD	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
1AE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1AF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1AG	0.000	0.013	0.063	0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.056
1AH	0.000	0.001	0.005	0.007	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.006
1BA	0.037	0.037	0.037	0.037	0.037	0.037	0.037	0.037	0.037	0.037	0.037	0.037
1BB	0.000	0.000	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083
1BC	0.001	0.001	0.001	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.001
1BD	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075
1BE	3.661	3.101	3.401	2.651	1.221	2.181	1.101	0.501	2.381	3.831	3.771	4.401
1BG	0.002	0.002	0.002	0.002	0.071	0.071	0.071	0.071	0.071	0.071	0.002	0.002
1BH	0.088	0.288	0.330	0.285	0.023	0.001	0.001	0.001	0.001	0.079	0.044	0.001
1CA	0.251	0.221	1.358	0.515	0.783	0.334	0.011	0.011	0.011	0.018	1.297	1.125
1CB	0.011	0.011	0.011	0.011	0.011	0.011	0.245	0.245	0.245	0.011	0.011	0.011
1CC	0.091	0.138	0.302	0.072	0.100	0.044	0.003	0.003	0.003	0.032	0.165	0.143
1CD	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091
1CE	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
1DA	0.000	0.000	0.000	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018
1DB	0.001	0.001	0.001	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041
1DC	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
1DD	0.003	0.004	0.005	0.005	0.004	0.003	0.003	0.003	0.005	0.007	0.006	0.005
1EA	0.000	0.000	0.000	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.000
1EB	0.001	0.027	0.067	0.121	0.113	0.086	0.082	0.079	0.137	0.177	0.168	0.056
1EC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1ED	0.000	0.000	0.000	0.143	0.143	0.143	0.143	0.143	0.143	0.143	0.143	0.143
1EE	0.000	0.000	0.000	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
1EF	3.060	2.819	4.072	2.101	2.023	6.135	11.968	14.379	19.652	12.159	8.801	11.198
1EG	0.000	0.000	0.000	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009
1FA	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
1FB	0.000	0.000	0.000	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
1FC	0.000	0.000	0.000	0.060	0.060	0.060	0.060	0.060	0.060	0.060	0.060	0.060
1FD	0.001	0.001	1.389	1.389	1.389	1.389	1.389	1.389	1.389	1.389	1.389	1.389
1FE	0.000	0.000	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
1FF	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
1FG	1.610	6.864	11.606	9.712	7.259	4.735	4.454	9.284	11.325	11.753	9.441	6.074
1GA	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
1GB	0.378	0.378	0.378	0.378	0.378	0.378	0.378	0.378	0.378	0.378	0.378	0.378
1GC	0.000	0.000	0.000	0.128	0.128	0.128	0.128	0.128	0.128	0.128	0.000	0.000
1GD	0.000	0.468	0.716	1.838	1.654	1.628	1.628	1.688	2.583	2.695	1.647	1.628
1GD1	0.042	0.000	0.000	0.000	0.042	0.083	0.124	0.166	0.166	0.166	0.124	0.083
1GD2	0.315	0.000	0.000	0.000	0.315	0.626	0.941	1.256	1.256	1.256	0.941	0.626
1GD3	0.293	0.000	0.000	0.000	0.293	0.582	0.875	1.168	1.168	1.168	0.875	0.582
1GE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1GF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1GG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1HA	0.000	0.110	0.172	0.197	0.163	0.145	0.143	0.149	0.348	0.391	0.180	0.162
1HB	0.000	0.004	0.006	0.036	0.034	0.034	0.034	0.035	0.043	0.044	0.034	0.034
1HC	0.003	0.010	0.034	0.023	0.017	0.005	0.003	0.003	0.032	0.050	0.046	0.028
1HD	1.740	2.247	2.251	3.371	1.268	1.728	0.728	0.369	0.803	1.725	2.288	2.380
1HE	0.000	0.093	0.142	0.042	0.005	0.000	0.000	0.012	0.189	0.211	0.004	0.000
1HF	0.000	0.023	0.091	0.059	0.062	0.021	0.000	0.001	0.108	0.158	0.135	0.086
1HG	0.000	0.001	0.006	0.004	0.004	0.001	0.000	0.000	0.007	0.010	0.008	0.005
1JA	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000
1JB	0.005	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
1JC	0.002	0.002	0.002	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.002	0.002
1JD	0.000	0.000	0.000	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087
1JE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1JF	0.001	0.001	0.001	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
1JG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1KA	4.004	9.814	10.434	9.644	10.829	8.291	4.456	8.460	14.833	16.412	13.254	6.317
1KB	3.096	7.586	8.066	7.456	8.371	6.409	3.444	6.540	11.467	12.688	10.246	4.883
1KB1	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.000	0.000
1KB2	0.000	0.009	0.016	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
1KB3	0.000	0.024	0.042	0.030	0.029	0.031	0.006	0.016	0.035	0.039	0.027	0.015
1KB4	0.000	0.135	0.232	0.166	0.161	0.170	0.036	0.090	0.193	0.213	0.146	0.082
1KB5	0.000	0.354	0.610	0.438	0.423	0.448	0.093	0.236	0.507	0.561	0.384	0.216
1KC	0.000	0.126	0.217	0.156	0.151	0.159	0.033	0.084	0.180	0.200	0.137	0.077
1LA1	0.000	0.081	0.139	0.100	0.096	0.102	0.021	0.054	0.115	0.128	0.087	0.049
1LA2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1LA3	0.000	0.000	0.000	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.000
1LB1	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020
1LB2	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059
Sub-Total	18.955	35.258	46.552	41.849	38.264	36.803	33.245	47.643	70.603	69.002	56.924	42.882

Table 4.3.2 Future Irrigation Water Demand (2/5)

Drainage Area 2

Unit : m3/sec

Basin	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2AA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2AB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2BA	0.000	0.052	0.030	0.086	0.113	0.081	0.020	0.000	0.085	0.114	0.106	0.039
2BB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2BC	0.008	0.100	0.173	0.093	0.116	0.032	0.008	0.008	0.050	0.081	0.165	0.135
2BD	0.000	0.345	0.616	0.320	0.405	0.089	0.000	0.000	0.158	0.273	0.588	0.476
2CA	0.000	0.111	0.198	0.127	0.154	0.053	0.024	0.024	0.075	0.088	0.213	0.153
2CB	0.000	0.415	0.402	0.856	1.142	0.878	0.271	0.000	0.725	1.263	1.293	0.526
2CB1	0.000	0.017	0.010	0.028	0.037	0.027	0.007	0.000	0.028	0.037	0.035	0.013
2CB2	0.000	0.125	0.169	0.159	0.127	0.028	0.028	0.001	0.102	0.170	0.171	0.114
2CB3	0.008	0.008	0.008	0.016	0.031	0.032	0.027	0.029	0.037	0.022	0.006	0.007
2CC	0.019	0.018	0.019	0.038	0.074	0.076	0.065	0.070	0.089	0.054	0.014	0.017
2CC1	0.253	0.244	0.253	0.516	0.996	1.023	0.878	0.941	1.204	0.724	0.190	0.226
2CC2	0.000	1.531	2.607	1.557	1.993	0.628	0.079	0.000	0.871	1.488	2.766	2.077
2CC3	0.008	0.012	0.020	0.006	0.015	0.017	0.007	0.004	0.019	0.017	0.018	0.019
2CC4	0.000	0.000	0.000	0.113	0.113	0.113	0.113	0.113	0.113	0.000	0.000	0.000
2CC5	0.135	0.045	0.084	0.084	0.138	0.174	0.162	0.121	0.075	0.057	0.090	0.135
2D	0.001	0.001	0.001	0.001	0.044	0.001	0.044	0.044	0.001	0.001	0.001	0.001
2EA	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000
2EB	0.639	0.192	0.293	0.001	0.305	0.476	0.420	0.224	0.001	0.272	0.422	0.628
2EB1	0.338	0.254	0.212	0.254	0.212	0.254	0.338	0.338	0.338	0.338	0.338	0.296
2EB2	0.461	0.346	0.288	0.346	0.288	0.346	0.461	0.461	0.461	0.461	0.461	0.403
2EB3	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
2EC	0.000	0.000	0.000	0.000	0.039	0.000	0.039	0.039	0.000	0.000	0.000	0.000
2ED	0.383	0.115	0.176	0.124	0.306	0.409	0.376	0.258	0.124	0.163	0.253	0.377
2EE	0.323	0.097	0.148	0.000	0.154	0.241	0.212	0.113	0.000	0.138	0.214	0.318
2EE1	0.065	0.020	0.030	0.000	0.031	0.049	0.043	0.023	0.000	0.028	0.043	0.064
2EE3	0.061	0.018	0.028	0.005	0.034	0.050	0.045	0.026	0.005	0.026	0.040	0.060
2EF	0.000	0.000	0.000	0.000	0.057	0.000	0.057	0.057	0.000	0.000	0.000	0.000
2EG1	0.000	0.000	0.000	0.007	0.007	0.000	0.007	0.007	0.000	0.000	0.000	0.000
2EG2	0.001	0.114	0.112	0.045	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2EG21	0.000	0.000	0.000	0.000	0.056	0.000	0.056	0.056	0.000	0.000	0.000	0.000
2EG22	0.000	0.000	0.000	0.222	0.222	0.222	0.222	0.222	0.222	0.222	0.222	0.222
2EH	0.000	0.000	0.000	0.000	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.000
2EH1	0.000	0.000	0.000	0.000	0.687	0.687	0.687	0.687	0.687	0.000	0.000	0.000
2EH2	0.005	0.002	0.219	0.219	0.219	0.005	0.002	0.002	0.003	0.007	0.221	0.222
2EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2EK	0.000	0.013	0.046	0.022	0.067	0.053	0.049	0.009	0.038	0.132	0.141	0.050
2FA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2FB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2FC	2.790	0.000	8.572	9.593	10.079	3.669	0.000	5.206	3.669	12.151	12.717	9.998
2GA	0.201	0.254	0.274	0.222	0.054	0.040	0.038	0.004	0.045	0.124	0.108	0.254
2GB	0.011	0.011	0.011	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011
2GC	0.060	0.060	0.060	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.060
2GD	0.020	0.601	0.814	3.991	4.349	4.201	4.178	0.051	0.516	1.389	4.963	4.359
2H	0.000	0.001	0.001	0.000	2.409	2.409	0.001	0.000	0.001	0.003	0.002	0.000
2J	0.024	0.057	0.049	0.884	0.888	0.877	0.877	0.021	0.042	0.059	0.906	0.876
2K	0.540	0.544	0.546	0.540	0.540	0.541	0.543	0.540	0.542	0.552	0.549	0.540
2KA	0.094	0.217	0.183	0.604	0.621	0.577	0.573	0.085	0.161	0.213	0.675	0.015
2KB	4.260	4.740	1.910	2.145	3.125	3.205	2.510	2.920	0.400	4.380	1.985	3.160
2KC	0.000	0.000	0.000	0.048	0.048	0.048	0.000	0.000	0.000	0.000	0.048	0.000
Sub-Total	10.711	10.682	18.566	23.347	30.355	21.654	13.512	12.749	10.932	25.091	30.008	25.855

Table 4.3.2 Future Irrigation Water Demand (3/5)

Drainage Area 3

Unit : m³/sec

Basin	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3AA	0.000	0.000	0.000	0.359	0.359	0.359	0.000	0.000	0.000	0.000	0.359	0.359
3AA11	0.000	0.000	0.000	0.342	0.342	0.342	0.000	0.000	0.000	0.000	0.342	0.342
3AA12	0.129	0.209	0.349	0.305	0.372	0.307	0.070	0.053	0.433	0.489	0.317	0.581
3AA13	0.000	0.000	0.000	0.007	0.007	0.007	0.000	0.000	0.000	0.000	0.007	0.007
3AA2	0.036	0.069	0.000	0.046	0.083	0.092	0.054	0.000	0.063	0.112	0.077	0.065
3AB	13.367	15.403	13.597	8.674	12.274	12.850	12.259	13.455	17.110	16.864	7.623	7.711
3AC	1.615	1.079	0.736	0.736	0.736	1.778	1.089	0.866	1.272	2.184	1.257	1.543
3BA	0.053	0.053	0.053	0.053	0.053	0.053	0.053	0.053	0.053	0.053	0.053	0.053
3BA1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3BA2	0.049	0.000	0.062	0.002	0.064	0.098	0.085	0.025	0.000	0.084	0.116	0.088
3BB	3.450	3.900	2.970	1.980	1.230	1.530	1.830	2.400	2.550	2.760	2.190	2.550
3BC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3BD	0.291	0.992	2.884	2.876	3.857	2.634	1.669	0.907	3.128	3.979	4.142	2.572
3CB	0.001	0.308	0.220	0.452	0.394	0.258	0.087	0.001	0.286	0.703	0.840	0.336
3DA	0.000	0.000	1.507	1.507	1.507	0.000	0.000	0.000	0.000	0.000	1.507	1.507
3DB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3EA	0.046	0.000	0.137	0.175	0.214	0.067	0.000	0.125	0.037	0.237	0.226	0.129
3EB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3EC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3ED	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3FA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3FA1	0.009	0.004	0.000	0.000	0.000	0.011	0.004	0.001	0.006	0.015	0.005	0.008
3FA2	0.649	0.062	0.109	0.689	0.699	0.770	0.675	0.651	0.682	0.762	0.726	0.683
3FA3	0.010	0.010	0.010	0.207	0.207	0.207	0.207	0.207	0.207	0.207	0.207	0.207
3FB	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095
3G	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.000	0.019	0.019	0.019	0.019
3G1	0.099	0.099	0.099	0.099	0.099	0.099	0.099	0.099	0.099	0.099	0.099	0.099
3G2	0.872	0.918	0.954	0.901	0.895	0.906	0.880	0.876	0.904	0.970	0.932	0.891
3G3	0.724	0.724	0.724	0.724	0.724	0.724	0.724	0.724	0.724	0.724	0.724	0.724
3G4	0.580	0.771	0.811	0.727	0.701	0.596	0.580	0.616	0.818	0.838	0.717	0.696
3HA	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
3HB	0.175	0.334	0.367	0.297	0.276	0.189	0.175	0.205	0.373	0.389	0.289	0.271
3HC	1.215	1.215	1.215	1.215	1.215	1.215	1.215	1.215	1.215	1.215	1.215	1.215
3HD	0.866	0.866	0.003	0.866	0.866	0.866	0.866	0.866	0.866	0.866	0.866	0.866
3HD2	0.888	0.888	0.000	0.888	0.888	0.888	0.888	0.888	0.888	0.888	0.888	0.888
3J	2.691	2.756	0.096	2.666	2.675	2.652	2.650	2.687	2.727	2.755	2.704	2.650
3K	0.163	0.618	0.712	0.512	0.452	0.202	0.163	0.250	0.730	0.776	0.489	0.438
3LA	0.719	0.878	2.536	1.963	0.910	1.060	0.782	2.035	3.373	2.226	0.886	1.619
3LB	2.251	2.752	7.944	6.147	2.850	3.320	2.448	6.375	10.567	6.974	2.774	5.071
3MA	0.062	0.062	0.000	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062
3MB	0.658	0.817	1.028	0.795	0.805	0.663	0.532	0.328	0.500	0.866	0.630	0.785
3MC	1.790	1.934	2.005	1.921	2.004	1.842	1.865	1.822	2.064	2.055	1.905	1.899
3MD1	0.009	0.009	0.000	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009
3MD2	0.294	0.416	0.859	0.294	0.570	0.728	0.387	0.396	1.312	0.905	0.294	0.328
3N	0.231	0.337	0.525	0.289	0.422	0.407	0.297	0.281	0.710	0.563	0.281	0.291
Sub-Total	34.306	38.797	42.826	39.098	39.134	38.104	33.018	38.774	54.082	51.943	36.071	37.856

Table 4.3.2 Future Irrigation Water Demand (4/5)

Drainage Area 4

Unit : m3/sec

Basin	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4AA	0.050	0.242	0.337	0.224	0.335	0.119	0.150	0.093	0.416	0.404	0.203	0.195
4AB	0.001	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.001
4AC	0.000	0.341	0.853	0.280	0.670	0.588	0.201	0.270	1.418	0.979	0.205	0.213
4AD	0.383	0.502	0.634	0.443	0.454	0.383	0.299	0.155	0.227	0.466	0.335	0.443
4BA	0.760	0.997	1.258	0.878	0.902	0.760	0.594	0.309	0.451	0.926	0.665	0.878
4BB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4BC	0.031	0.419	0.672	0.481	0.744	0.411	0.230	0.331	0.986	0.809	0.361	0.331
4BD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4BE	0.112	0.001	0.427	0.520	0.562	0.146	0.001	0.278	0.148	0.550	0.468	0.357
4BF	0.197	0.000	3.555	3.092	3.142	0.504	0.000	2.185	1.405	3.170	2.975	2.542
4BG	0.068	0.000	1.235	1.074	1.092	0.175	0.000	0.759	0.488	1.102	1.034	0.883
4CA	23.640	5.880	0.000	12.000	16.680	21.000	21.930	18.600	9.720	20.160	22.320	24.120
4CB	0.236	0.000	0.955	0.967	0.849	0.116	0.000	0.555	0.299	1.028	0.873	0.946
4CC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4DA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4DA1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4DA2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4DB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4DC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4DD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4DE	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.074	0.006	0.006	0.006
4EA	0.003	0.060	0.102	0.080	0.114	0.071	0.047	0.000	0.029	0.103	0.104	0.067
4EA1	0.009	0.223	0.381	0.299	0.424	0.266	0.174	0.000	0.110	0.385	0.390	0.250
4EA2	0.000	0.001	0.002	0.002	0.003	0.002	0.001	0.000	0.001	0.002	0.002	0.002
4EB	0.627	0.627	0.627	0.627	0.627	0.627	0.627	0.627	0.627	0.627	0.627	0.627
4EC	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161
4ED	1.126	1.286	1.425	1.268	1.387	1.906	1.296	1.123	1.192	1.366	1.337	1.279
4FA	0.000	0.000	0.000	0.016	0.016	0.000	0.000	0.000	0.000	0.000	0.016	0.016
4FA1	0.010	0.053	0.089	0.591	0.625	0.224	0.055	0.006	0.023	0.071	0.611	0.595
4FA2	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.000	0.000	0.001	0.000
4FB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4GA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4GB	0.015	0.015	0.015	0.000	0.000	0.015	0.015	0.015	0.015	0.000	0.000	0.000
4GC	0.009	0.009	0.009	0.000	0.000	0.009	0.009	0.009	0.009	0.000	0.000	0.009
4GD	0.009	0.009	0.009	0.000	0.000	0.009	0.009	0.009	0.009	0.009	0.000	0.000
4GE	0.013	0.013	0.013	0.000	0.000	0.013	0.013	0.013	0.013	0.013	0.000	0.000
4GF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4GG	0.000	0.000	0.003	0.003	0.003	0.000	0.000	0.000	0.000	0.003	0.003	0.000
4HA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4HB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4HC	0.000	0.230	0.296	0.510	0.762	0.536	0.143	0.012	0.550	0.651	0.501	0.207
4JA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4JB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4KA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4KB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sub-Total	27.465	11.076	13.065	23.525	29.561	28.048	25.963	25.518	18.372	32.992	33.199	34.128

Table 4.3.2 Future Irrigation Water Demand (5/5)
Drainage Area 5

Unit : m3/sec

Basin	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
5AA	0.000	0.007	0.014	0.012	0.017	0.007	0.003	0.000	0.000	0.013	0.017	0.007
5AB	0.003	0.060	0.102	0.080	0.114	0.071	0.047	0.000	0.029	0.103	0.104	0.067
5AC	0.009	0.223	0.381	0.299	0.424	0.266	0.174	0.000	0.110	0.385	0.390	0.250
5AD	0.000	0.001	0.002	0.002	0.003	0.002	0.001	0.000	0.001	0.002	0.002	0.002
5BA	0.627	1.254	1.254	1.254	1.254	1.254	1.254	1.254	1.254	1.254	1.254	1.254
5BB	0.161	0.321	0.321	0.321	0.321	0.321	0.321	0.321	0.321	0.321	0.321	0.321
5BC	1.126	2.400	2.539	2.382	2.501	3.020	2.410	2.237	2.306	2.480	2.451	2.393
5BD	0.000	0.000	0.000	0.033	0.033	0.000	0.000	0.000	0.000	0.000	0.033	0.033
5BE	0.010	0.053	0.089	1.142	1.176	0.224	0.055	0.006	0.023	0.071	1.162	1.146
5CA	0.000	0.000	0.000	0.002	0.002	0.000	0.002	0.002	0.000	0.000	0.002	0.000
5CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5CC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5DA	0.015	0.015	0.015	0.000	0.000	0.015	0.015	0.015	0.015	0.000	0.000	0.000
5DB	0.009	0.009	0.009	0.000	0.000	0.009	0.009	0.009	0.009	0.000	0.000	0.009
5DC	0.009	0.009	0.009	0.000	0.000	0.009	0.009	0.009	0.009	0.009	0.000	0.000
5DD	0.013	0.013	0.013	0.000	0.000	0.013	0.013	0.013	0.013	0.013	0.000	0.000
5EA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5EB	0.000	0.000	0.006	0.006	0.006	0.000	0.000	0.000	0.000	0.006	0.006	0.000
5EC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5ED	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5FA	0.000	0.230	0.296	0.510	0.762	0.536	0.143	0.012	0.550	0.651	0.501	0.207
5FB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5GA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5GB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5H	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5J	0.000	0.007	0.014	0.012	0.017	0.007	0.003	0.000	0.000	0.013	0.017	0.007
Sub-Total	1.982	4.602	5.064	6.055	6.630	5.755	4.459	3.878	4.640	5.321	6.260	5.696
Total	93.419	100.416	126.073	133.874	143.945	130.362	110.197	128.562	158.629	184.348	162.464	146.418

Table 4.4.1 Projected Livestock Population (Cattle) (1/2)

Unit: 1000

District	1988			1990			2000			2010		
	Dairy Cattle	Beef Cattle	Total	Dairy Cattle	Beef Cattle	Total	Dairy Cattle	Beef Cattle	Total	Dairy Cattle	Beef Cattle	Total
110 Nairobi	4.36	2.21	6.57	4.507	2.292	6.799	5.319	2.75	8.069	6.277	3.3	9.577
210 Kiambu	145.879	28.3255	174.2045	150.792	29.377	180.169	177.954	35.253	213.207	210.008	42.304	252.312
220 Kinnyaga	68.7025	30.734	99.4365	71.016	31.875	102.891	83.808	38.25	122.058	98.904	45.9	144.804
230 Muranga	156.5705	25.216	181.7865	161.844	26.152	187.996	190.996	31.383	222.379	225.399	37.66	263.059
240 Nyandarua	208.808	4.938	213.746	215.84	5.121	220.961	254.718	6.145	260.863	300.599	7.374	307.973
250 Nyeri	137.059	5.4655	142.5245	141.675	5.668	147.343	167.194	6.802	173.996	197.31	8.162	205.472
310 Kilifi	13.7625	101.485	115.2475	14.226	105.254	119.48	16.788	126.306	143.094	19.812	151.568	171.38
320 Kwale	2.2075	237.4645	239.672	2.282	246.284	248.566	2.693	295.543	298.236	3.178	354.654	357.832
330 Lamu	3.9125	47.5	51.4125	4.044	49.264	53.308	4.772	59.117	63.889	5.632	70.941	76.573
340 Mombasa	1.99	3.0025	4.9925	2.057	3.114	5.171	2.428	3.737	6.165	2.865	4.484	7.349
350 Taita Taveta	8.95	140	148.95	9.251	145.199	154.45	10.917	174.24	185.157	12.883	209.089	221.972
360 Tana River	37.6335	260.54	260.54	38.901	270.216	270.216	45.908	324.261	324.261	0	389.116	389.116
410 Embu	0.15	197.5885	197.7385	0.155	204.927	205.082	0.183	245.914	246.097	0.216	295.099	295.315
420 Isiolo	6.7	299.743	306.443	6.926	310.875	317.801	8.174	373.052	381.226	9.646	447.665	457.311
440 Machakos	36.5595	371.627	408.1865	37.791	385.429	423.22	44.598	462.518	507.116	52.631	555.025	607.656
450 Marsabit	115.0025	375.435	490.4375	118.876	389.378	508.254	140.289	467.256	607.545	165.559	560.711	726.27
460 Meru	0.37	538.85	539.22	0.382	558.862	559.244	0.451	670.639	671.09	0.532	804.772	805.304
510 Garissa	0.04	128.391	128.431	0.041	133.155	133.2	0.048	159.792	159.84	0.057	191.752	191.809
520 Mandera	1.102	403.3	404.402	1.139	418.278	419.417	1.344	501.937	503.281	1.586	602.328	603.914
530 Wajir	1.68	247	248.68	1.737	256.173	257.91	2.05	307.409	309.459	2.419	368.893	371.312
610 Kisii	153	430	583	158.153	445.97	604.123	186.64	535.167	721.807	220.259	642.204	862.463
620 Kisumu	3.4355	252.2675	255.703	3.551	261.636	265.187	4.191	313.965	318.156	4.946	376.76	381.706
630 Siaya	1.102	403.3	404.402	1.139	418.278	419.417	1.344	501.937	503.281	1.586	602.328	603.914
640 South Nyanza	1.68	247	248.68	1.737	256.173	257.91	2.05	307.409	309.459	2.419	368.893	371.312
710 Kajiado	491.985	125.165	617.15	508.555	129.813	638.368	600.159	155.777	755.936	708.263	186.934	895.197
720 Kericho	26.34	235.294	261.634	27.227	244.032	271.259	32.131	292.84	324.971	37.919	351.41	389.329
730 Laikipia	251.57	168.76	420.33	260.043	175.028	435.071	306.883	210.035	516.918	362.16	252.044	614.204
740 Nakuru	37.3965	959.329	996.7255	38.656	994.957	1033.613	45.619	1193.956	1239.575	53.836	1432.756	1486.592
750 Narok	156	16.65	172.65	161.254	17.268	178.522	190.3	20.722	211.022	224.578	24.867	249.445
760 Trans Nzoia	250.46	22	272.46	258.895	22.817	281.712	305.529	27.381	332.91	360.563	32.857	393.42
770 Usain Gishu	56.345	142.625	198.97	58.243	147.922	206.165	68.734	177.507	246.241	81.115	213.01	294.125
810 Baringo	46.835	105.6	152.435	48.412	109.522	157.934	57.132	131.427	188.559	67.423	157.713	225.136
820 Elg. Marakwet	189.74	174.2625	364.0025	196.13	180.734	376.864	231.458	216.882	448.34	273.15	260.26	533.41
830 Nandi	160.031	160.031	160.031	0	165.974	165.974	0	199.17	199.17	0	239.005	239.005
840 Samburu	254.275	254.275	254.275	0	263.718	263.718	0	316.464	316.464	0	379.759	379.759
850 Turkana	11.7725	180.75	192.5225	12.169	187.463	199.632	14.361	224.957	239.318	16.948	269.95	286.898
860 West Pokot	27.75	266.725	294.475	28.685	276.631	305.316	33.852	331.959	365.811	39.95	398.353	438.303
910 Bungoma	2.06	154.565	156.625	2.129	160.305	162.434	2.512	192.367	194.879	2.964	230.842	233.806
920 Busia	50.4465	393.201	443.6475	52.145	407.804	459.949	61.538	489.368	550.906	72.623	587.245	659.868
930 Kakamega	2706.575	8805.9515	11512.526	2797.729	9132.987	11930.716	3301.671	10959.653	14261.32	3896.387	13151.664	17048.051
Total												

Source: Ref.1.3.F.19

Table 4.4.1 Projected Livestock Population (Camel, Sheep/Goats) (2/2)

Unit : 1000

District	Camel				Sheep/Goats			
	1988	1990	2000	2010	1988	1990	2000	2010
110 Nairobi					7.7	8	9.6	11.5
210 Kiambu					136.5	141.6	169.9	203.9
220 Kirinyaga					86.6	89.8	107.8	129.4
230 Muranga					82.6	85.7	102.8	123.4
240 Nyandarua					239.5	248.4	298.1	357.7
250 Nyeri					118.3	122.7	147.2	176.6
310 Kilifi					128.4	133.2	159.8	191.8
320 Kwale					222.4	230.7	276.8	332.2
330 Lamu					15.9	16.5	19.8	23.8
340 Mombasa					9.5	9.9	11.9	14.3
350 Taita Taveta					302.5	313.7	376.4	451.7
360 Tana River	33.148	34.264	40.436	47.72	528.8	548.4	658.1	789.7
410 Embu	0.2	0.207	0.244	0.288	133.6	138.6	166.3	199.6
420 Isiolo	27.059	27.97	33.008	38.954	360.5	373.9	448.7	538.4
430 Kitui					600.7	623	747.6	897.1
440 Machakos					433.7	449.8	539.8	647.8
450 Marsabit	186.067	192.334	226.978	267.863	907.0	940.7	1128.8	1354.6
460 Meru	2.74	2.832	3.342	3.944	579.2	600.7	720.8	865
510 Garissa	57.811	59.758	70.522	83.225	415.8	431.2	517.4	620.9
520 Mandera	104.739	108.266	127.767	150.781	375.7	389.7	467.6	561.1
530 Wajir	159.787	165.168	194.919	230.029	527.3	546.9	656.3	787.6
610 Kisii					197.9	205.2	246.2	295.4
620 Kisumu					287.2	297.9	357.5	429
630 Siaya					325.8	337.9	405.5	486.6
640 South Nyanza					408.5	423.7	508.4	610.1
710 Kajiado					961.4	997.1	1196.5	1435.8
720 Kericho					224.1	232.4	278.9	334.7
730 Laikipia	0.791	0.818	0.965	1.139	472.3	489.8	587.8	705.4
740 Nakuru					319.3	331.2	397.4	476.9
750 Narok					1675.8	1738	2085.6	2502.7
760 Trans Nzoia					59.0	61.2	73.4	88.1
770 Uasin Gishu					127.2	131.9	158.3	190
810 Baringo	3.012	3.113	3.674	4.336	661.6	686.2	823.4	988.1
820 Elg. Marakwe	3.7	3.825	4.514	5.327	314.2	325.9	391.1	469.3
830 Nandi					64.0	66.4	79.7	95.6
840 Samburu	14.026	14.498	17.109	20.191	451.1	467.9	561.5	673.8
850 Turkana	102.078	105.516	124.522	146.952	1805.4	1872.4	2246.9	2696.3
860 West Pokot	0.541	0.559	0.66	0.779	266.7	276.6	331.9	398.3
910 Bungoma					102.9	106.7	128	153.6
920 Busia					74.4	77.2	92.6	111.1
930 Kakamega					55.6	57.7	69.2	83
Total	695.699	719.128	848.66	1001.53	15066.6	15626.4	18751.3	22501.9

Source: Ref.F.3, F.11, F.19

Table 4.4.2 Projected Livestock Unit

District	1990						2000						2010						
	Grade		Local		Sheep		Grade		Local		Sheep		Grade		Local		Sheep		
	Cattle	LU	Cattle	LU	Goat	Camel	Cattle	LU	Cattle	LU	Goat	Camel	Cattle	LU	Cattle	LU	Goat	Camel	LU
110 Nairobi	4.51	2.29	8.00	3.93	9.60	0.00	5.32	2.75	177.95	35.25	169.90	0.00	6.28	3.30	11.50	0.00	6.28	3.30	11.50
210 Kiambu	150.79	29.38	141.60	105.23	169.90	0.00	177.95	35.25	177.95	35.25	169.90	0.00	210.01	42.30	203.90	0.00	210.01	42.30	203.90
220 Kirinyaga	71.02	31.88	89.80	57.85	83.81	0.00	83.81	38.25	83.81	38.25	107.80	0.00	98.90	45.90	129.40	0.00	98.90	45.90	129.40
230 Muranga	161.84	26.15	85.70	106.31	191.00	0.00	191.00	31.38	191.00	31.38	102.80	0.00	225.40	37.66	123.40	0.00	225.40	37.66	123.40
240 Nyandarua	215.84	5.12	248.40	140.15	254.72	0.00	254.72	6.15	254.72	6.15	298.10	0.00	300.60	7.37	357.70	0.00	300.60	7.37	357.70
250 Nyeni	141.68	5.67	122.70	90.02	167.19	0.00	167.19	6.80	167.19	6.80	147.20	0.00	197.31	8.16	176.60	0.00	197.31	8.16	176.60
310 Kilifi	14.23	105.25	133.20	56.23	16.79	0.00	16.79	126.31	16.79	126.31	159.80	0.00	19.81	151.57	191.80	0.00	19.81	151.57	191.80
320 Kwale	2.28	246.28	230.70	108.55	2.69	0.00	2.69	295.54	2.69	295.54	276.80	0.00	3.18	354.65	332.20	0.00	3.18	354.65	332.20
330 Lamu	4.04	49.26	16.50	21.65	4.77	0.00	4.77	59.12	4.77	59.12	19.80	0.00	5.63	70.94	23.80	0.00	5.63	70.94	23.80
340 Mombasa	2.06	3.11	9.90	3.00	2.43	0.00	2.43	3.74	2.43	3.74	11.90	0.00	2.87	4.48	14.30	0.00	2.87	4.48	14.30
350 Taïta Taveta	9.25	145.20	313.70	80.86	10.92	0.00	10.92	174.24	10.92	174.24	376.40	0.00	12.88	209.09	451.70	0.00	12.88	209.09	451.70
360 Tana River	0.00	270.22	548.40	161.32	0.00	34.26	0.00	324.26	0.00	324.26	658.10	40.44	0.00	389.12	789.70	47.72	0.00	389.12	789.70
410 Embu	38.90	64.33	138.60	55.43	45.91	0.21	45.91	77.19	45.91	77.19	166.30	0.24	54.18	92.63	199.60	0.29	54.18	92.63	199.60
420 Isiolo	0.16	204.93	373.90	120.82	0.18	245.91	0.18	245.91	0.18	245.91	448.70	33.01	0.22	295.10	538.40	38.95	0.00	295.10	538.40
430 Kiuri	6.93	310.88	623.00	162.51	8.17	0.00	8.17	373.05	8.17	373.05	747.60	0.00	9.65	447.67	897.10	0.00	9.65	447.67	897.10
440 Machakos	37.79	385.43	449.80	195.26	44.60	0.00	44.60	462.52	44.60	462.52	539.80	0.00	52.63	555.03	647.80	0.00	52.63	555.03	647.80
450 Marsabit	0.00	342.50	940.70	321.44	0.00	192.33	0.00	411.00	0.00	411.00	1,128.80	226.98	0.00	493.20	1,354.60	267.86	0.00	493.20	1,354.60
460 Meru	118.88	389.38	600.70	254.59	140.29	0.83	140.29	467.26	140.29	467.26	720.80	3.34	165.56	560.71	865.00	2.94	165.56	560.71	865.00
510 Gariisa	0.38	558.86	431.20	277.21	0.45	59.76	0.45	670.64	0.45	670.64	517.40	70.52	0.53	804.77	620.90	83.23	0.53	804.77	620.90
520 Mandera	0.04	133.16	389.70	149.11	0.05	199.79	0.05	199.79	0.05	199.79	467.60	127.77	0.06	191.75	561.10	150.78	0.06	191.75	561.10
530 Wajir	0.00	266.71	546.90	247.63	0.00	165.17	0.00	320.05	0.00	320.05	656.30	194.92	0.00	384.06	787.60	230.03	0.00	384.06	787.60
610 Kisii	158.15	445.97	205.20	267.94	186.64	0.00	186.64	535.17	186.64	535.17	246.20	0.00	220.26	642.20	295.40	0.00	220.26	642.20	295.40
620 Kisumu	3.55	261.64	297.90	119.65	4.19	0.00	4.19	313.97	4.19	313.97	357.50	0.00	4.95	376.76	429.00	0.00	4.95	376.76	429.00
630 Siaya	1.14	418.28	337.90	179.05	1.34	501.94	1.34	501.94	1.34	501.94	405.50	0.00	1.59	602.33	486.60	0.00	1.59	602.33	486.60
640 South Nyanza	1.74	256.17	423.70	125.42	2.05	307.41	2.05	307.41	2.05	307.41	508.40	0.00	2.42	368.89	610.10	0.00	2.42	368.89	610.10
710 Kajiado	0.00	690.97	997.10	325.45	0.00	0.00	0.00	829.17	0.00	829.17	1,196.50	0.00	0.00	995.00	1,435.80	0.00	0.00	995.00	1,435.80
720 Kericho	508.56	129.81	232.40	349.09	600.16	0.00	600.16	155.78	600.16	155.78	278.90	0.00	708.26	186.93	334.70	0.00	708.26	186.93	334.70
730 Laikipia	27.23	244.03	489.80	140.37	32.13	292.84	32.13	292.84	32.13	292.84	587.80	0.97	37.92	351.41	705.40	1.14	37.92	351.41	705.40
740 Nakuru	260.04	175.03	331.20	233.57	306.88	0.00	306.88	210.04	306.88	210.04	397.40	0.00	362.16	252.04	476.90	0.00	362.16	252.04	476.90
750 Narok	38.66	994.96	1,738.00	511.44	45.62	0.00	45.62	1,193.96	45.62	1,193.96	2,085.60	0.00	53.84	1,432.76	2,502.70	0.00	53.84	1,432.76	2,502.70
760 Trans Nzoia	161.25	17.27	61.20	100.98	190.30	0.00	190.30	20.72	190.30	20.72	73.40	0.00	224.58	24.87	88.10	0.00	224.58	24.87	88.10
770 Uasin Gishu	258.90	22.82	131.90	162.66	305.53	0.00	305.53	27.38	305.53	27.38	158.30	0.00	360.56	32.86	190.00	0.00	360.56	32.86	190.00
810 Baringo	58.24	147.92	686.20	137.47	68.73	3.11	68.73	171.51	68.73	171.51	823.40	3.67	81.12	213.01	988.10	4.34	81.12	213.01	988.10
820 Elg. Marakwet	48.41	109.52	325.90	93.01	57.13	3.83	57.13	131.43	57.13	131.43	391.10	4.51	67.42	157.71	469.30	5.33	67.42	157.71	469.30
830 Nandi	196.13	180.73	66.40	181.35	231.46	0.00	231.46	216.88	231.46	216.88	79.70	0.00	273.15	260.26	95.60	0.00	273.15	260.26	95.60
840 Samburu	0.00	165.97	467.90	103.88	0.00	14.50	0.00	199.17	0.00	199.17	561.50	17.11	0.00	239.01	673.80	20.19	0.00	239.01	673.80
850 Turkana	0.00	263.72	1,872.40	299.34	0.00	105.52	0.00	316.46	0.00	316.46	2,246.90	124.52	0.00	379.76	2,696.30	146.95	0.00	379.76	2,696.30
860 West Pokot	12.17	187.46	276.60	95.91	14.36	0.56	14.36	224.96	14.36	224.96	331.90	0.66	16.95	269.95	398.30	0.78	16.95	269.95	398.30
910 Bungoma	28.69	276.63	106.70	125.89	33.85	0.00	33.85	331.96	33.85	331.96	128.00	0.00	39.95	398.35	153.60	0.00	39.95	398.35	153.60
920 Busia	2.13	160.31	77.20	65.91	2.51	0.00	2.51	192.37	2.51	192.37	92.60	0.00	2.96	230.84	111.10	0.00	2.96	230.84	111.10
930 Kakamega	52.15	407.80	57.70	184.13	61.54	0.00	61.54	489.37	61.54	489.37	69.20	0.00	72.62	587.25	83.00	0.00	72.62	587.25	83.00
Total	2,797.73	9,132.99	15,626.40	6,521.60	3,301.67	719.13	3,301.67	10,959.65	3,301.67	10,959.65	18,751.30	848.66	3,896.39	13,151.66	22,501.90	1,001.53	3,896.39	13,151.66	22,501.90

Unit : 1000 LU

Source: Ref. F.3, F.11, F.19

Table 4.4.3 Livestock Water Demand by Sub-basin

Unit : l/sec

Subbasin	1990	2000	2010	Subbasin	1990	2000	2010	Subbasin	1990	2000	2010
1AA	7.40	8.87	10.60	2AA	28.64	34.19	40.68	4AA	8.05	9.61	11.32
1AB	5.69	6.78	8.11	2AB	25.33	30.31	36.31	4AB	10.47	12.49	14.73
1AC	3.05	3.63	4.34	2BA	9.40	11.23	13.42	4AC	6.94	8.27	9.73
1AD	7.80	9.42	11.27	2BB	11.29	13.50	16.13	4AD	7.53	8.96	10.55
1AE	1.76	2.13	2.55	2BC	26.75	31.97	38.14	4BA	5.68	6.73	7.93
1AF	10.14	12.17	14.54	2BD	40.33	48.25	57.75	4BB	4.57	5.48	6.44
1AG	9.03	10.84	12.96	2CA	9.59	11.47	13.74	4BC	5.44	6.57	7.72
1AH	12.45	15.06	18.01	2CB	32.40	38.40	46.12	4BD	13.31	15.68	18.47
1BA	13.65	16.16	19.34	2CC	53.29	63.45	76.14	4BE	13.05	15.42	18.17
1BB	16.74	19.83	23.65	2D	49.84	59.49	71.28	4BF	9.20	10.83	12.76
1BC	14.26	16.97	20.21	2EA	6.40	7.63	9.06	4BG	6.64	7.85	9.35
1BD	18.56	22.03	26.26	2EB	9.15	10.90	13.00	4CA	12.66	14.97	17.64
1BE	26.89	32.00	38.05	2EC	13.86	16.52	19.59	4CB	7.67	9.03	10.64
1BG	22.32	26.59	31.67	2ED	5.62	6.66	7.94	4CC	17.09	20.19	23.89
1BH	14.66	17.47	20.87	2EE	4.60	5.46	6.55	4DA	14.94	18.09	21.29
1CA	17.62	20.83	24.77	2EF	2.94	3.50	4.20	4DB	9.72	11.78	13.85
1CB	17.83	21.08	25.07	2EG	6.66	7.94	9.42	4DC	4.19	4.99	6.01
1CC	17.90	21.17	25.16	2EG	11.84	14.08	16.82	4DD	5.21	6.18	7.48
1CD	18.34	21.80	25.84	2EH	4.77	5.67	6.80	4DE	6.29	7.50	9.02
1CE	7.02	8.37	9.97	2EJ	11.45	13.65	16.42	4EA	11.39	13.64	16.28
1DA	14.80	17.69	21.12	2EK	4.45	5.31	6.39	4EB	17.47	20.90	24.98
1DB	18.28	21.78	26.04	2FA	10.30	12.27	14.55	4EC	7.07	8.40	10.16
1DC	10.96	13.08	15.64	2FB	2.56	3.05	3.62	4ED	19.19	22.90	27.56
1DD	9.60	11.46	13.70	2FC	26.91	32.10	38.12	4FA	30.32	36.31	43.32
1EA	13.15	15.73	18.79	2GA	6.67	7.94	9.39	4FB	40.78	48.85	58.29
1EB	11.27	13.48	16.12	2GB	22.42	26.60	31.34	4GA	13.93	16.71	19.92
1EC	6.82	8.16	9.75	2GC	18.16	21.52	25.34	4GB	16.78	20.18	24.14
1ED	4.38	5.24	6.26	2GD	20.61	24.59	29.20	4GC	5.13	6.17	7.38
1EE	15.77	18.83	22.60	2H	88.29	105.84	126.61	4GD	33.66	40.51	48.45
1EF	12.08	14.47	17.36	2J	72.92	87.25	104.53	4GE	42.62	51.26	61.27
1EG	21.64	25.82	30.99	2KA	83.78	100.47	120.54	4GF	17.04	20.51	24.54
1FA	6.17	7.28	8.66	2KB	24.70	29.63	35.55	4GG	38.02	45.50	54.48
1FB	14.58	17.35	20.54	2KC	24.05	28.87	34.63	4HA	18.47	22.19	26.53
1FC	10.60	12.61	14.94					4HB	20.45	24.61	29.42
1FD	17.34	20.62	24.43	3AA	5.14	6.32	7.41	4JA	41.44	49.73	59.57
1FE	22.22	26.52	31.58	3AB	15.11	18.14	21.75	4JB	12.04	14.41	17.26
1FF	8.47	10.13	12.11	3AC	7.31	8.80	10.44	4KA	28.04	33.53	40.17
1FG	35.84	42.77	51.38	3BA	11.22	13.60	15.75	4KB	33.02	39.37	47.17
1GA	15.60	18.53	21.97	3BB	5.74	6.79	8.01				
1GB	19.70	23.50	27.92	3BC	11.54	13.62	16.09	5AA	21.24	25.24	29.89
1GC	32.86	38.90	46.07	3BD	7.49	8.85	10.44	5AB	9.32	11.06	13.06
1GD	26.59	31.77	38.00	3CB	9.74	11.50	13.58	5AC	9.02	10.80	13.03
1GE	13.84	16.44	19.53	3DA	7.80	9.30	11.11	5AD	4.73	5.65	6.79
1GF	8.56	10.27	12.34	3DB	5.74	6.86	8.22	5BA	2.97	3.55	4.22
1GG	14.80	17.54	20.81	3EA	7.01	8.37	10.04	5BB	6.67	7.96	9.39
1HA	28.12	33.72	40.42	3EB	6.34	7.57	9.08	5BC	18.89	22.55	26.87
1HB	25.08	30.09	36.21	3EC	5.46	6.52	7.82	5BD	7.72	9.21	10.99
1HC	22.10	26.35	31.66	3ED	4.49	5.36	6.43	5BE	14.40	17.24	20.63
1HD	23.80	28.39	33.92	3FA	81.87	98.22	117.80	5CA	12.96	15.53	18.68
1HE	23.15	27.62	33.00	3FB	28.17	33.67	40.38	5CB	6.90	8.28	9.88
1HF	10.92	13.02	15.56	3G	33.54	40.21	48.19	5CC	6.64	7.96	9.51
1HG	3.77	4.49	5.37	3HA	2.52	3.00	3.59	5DA	29.66	35.53	42.43
1JA	23.31	27.64	32.74	3HB	6.78	8.07	9.68	5DB	9.70	11.62	13.99
1JB	10.00	11.84	14.01	3HC	7.78	9.20	11.09	5DC	9.94	11.90	14.35
1JC	12.37	14.65	17.35	3HD1	1.65	1.95	2.35	5DD	5.38	6.46	7.71
1JD	8.46	10.01	11.85	3HD2	1.04	1.22	1.48	5EA	67.17	80.32	95.35
1JE	28.94	34.35	40.81	3HD3	1.11	1.31	1.58	5EB	84.86	101.43	120.50
1JF	39.76	47.15	55.94	3J	7.83	9.33	11.17	5EC	84.26	100.75	119.91
1JG	13.00	15.51	18.52	3K	34.22	40.74	48.88	5FA	83.64	100.29	119.60
1KA	20.59	24.57	29.36	3L	20.71	24.57	29.51	5FB	37.08	44.46	53.15
1KB	105.80	126.25	150.88	3MA	21.55	25.67	30.75	5G	63.98	76.60	90.77
1KC	50.18	59.97	71.74	3MB	10.62	12.63	15.16	5H	33.48	40.10	47.49
1LA	25.22	29.95	35.55	3MC	7.89	9.40	11.28	5J	77.63	92.68	110.24
1LA	17.32	20.76	24.89	3MD	8.04	9.16	10.62				
1LA	43.97	52.74	63.28	3N	27.04	32.50	38.97				
1LB	28.85	34.39	41.00								
1LB	43.75	52.47	62.96								

Table 4.4.4 Livestock Water Demand by District

	Unit:m3/sec		
District	1990	2000	2010
110 Nairobi	0.002	0.003	0.003
210 Kiambu	0.061	0.072	0.085
220 Kirinyaga	0.033	0.04	0.047
230 Muranga	0.062	0.073	0.086
240 Nyandarua	0.081	0.096	0.113
250 Nyeri	0.052	0.062	0.073
310 Kilifi	0.033	0.039	0.047
320 Kwale	0.063	0.075	0.09
330 Lamu	0.013	0.015	0.018
340 Mombasa	0.002	0.002	0.002
350 Taita Taveta	0.047	0.056	0.067
360 Tana River	0.093	0.112	0.134
410 Embu	0.032	0.038	0.046
420 Isiolo	0.07	0.084	0.1
430 Kitui	0.094	0.113	0.135
440 Machakos	0.113	0.135	0.162
450 Marsabit	0.186	0.222	0.264
460 Meru	0.147	0.176	0.21
510 Garissa	0.16	0.192	0.23
520 Mandera	0.086	0.103	0.122
530 Wajir	0.143	0.171	0.203
610 Kisii	0.155	0.185	0.221
620 Kisumu	0.069	0.083	0.1
630 Siaya	0.104	0.124	0.149
640 South Nyanza	0.073	0.087	0.104
710 Kajiado	0.188	0.226	0.271
720 Kericho	0.202	0.239	0.283
730 Laikipia	0.081	0.097	0.117
740 Nakuru	0.135	0.161	0.191
750 Narok	0.296	0.355	0.426
760 Trans Nzoia	0.058	0.069	0.082
770 Uasin Gishu	0.094	0.111	0.132
810 Baringo	0.08	0.095	0.114
820 Elg. Marakwet	0.054	0.064	0.077
830 Nandi	0.105	0.125	0.148
840 Samburu	0.06	0.072	0.086
850 Turkana	0.173	0.207	0.248
860 West Pokot	0.056	0.067	0.08
910 Bungoma	0.073	0.087	0.104
920 Busia	0.038	0.046	0.055
930 Kakamega	0.107	0.128	0.153
Total	3.774	4.507	5.378

Table 4.6.1 Summary of Load Forecast - Fiscal Year 1986/87 - 2005/06

Fiscal Year (Jun/Jul)	Low Forecast		Median Forecast		High Forecast	
	Peak Load (MW)	Net Gene. (GWh)	Peak Load (MW)	Net Gene. (GWh)	Peak Load (MW)	Net Gene. (GWh)
1986/87	416	2,509	417	2,515	418	2,520
1987/88	440	2,641	443	2,655	446	2,674
1988/89	464	2,779	469	2,804	476	2,845
1989/90	489	2,920	496	2,958	509	3,029
1990/91	514	3,065	524	3,122	544	3,232
1991/92	537	3,202	552	3,285	581	3,450
1992/93	562	3,343	581	3,454	620	3,677
1993/94	587	3,492	612	3,633	662	3,920
1994/95	614	3,648	644	3,822	707	4,181
1995/96	642	3,809	678	4,019	756	4,460
1996/97	671	3,980	714	4,229	807	4,760
1997/98	701	4,159	752	4,451	863	5,081
1998/99	734	4,348	793	4,685	923	5,425
1999/00	769	4,555	837	4,943	988	5,806
2000/01	806	4,771	883	5,213	1,058	6,211
2001/02	844	4,996	932	5,496	1,132	6,643
2002/03	884	5,228	982	5,791	1,211	7,102
2003/04	925	5,466	1,035	6,095	1,295	7,584
2004/05	967	5,709	1,089	6,410	1,383	8,093
2005/06	1,011	5,967	1,147	6,744	1,478	8,640
Average Annual Growth Rate						
1986/87- 1990/91	5.4%	5.1%	5.9%	5.6%	6.8%	6.4%
1990/91- 2000/01	4.6%	4.5%	5.4%	5.3%	6.9%	6.8%

Source : National Power Development Plan, Table 4.7, 1987
 Remark : Base year = 1985

Table 4.6.2 Summary of Revised Load Forecast

Fiscal Year (Jun/Jul)	Low Forecast		Median Forecast		High Forecast	
	Peak Load (MW)	Gross Gene. (GWh)	Peak Load (MW)	Gross Gene. (GWh)	Peak Load (MW)	Gross Gene. (GWh)
1988/89	490	2,916	490	2,916	490	2,916
1989/90	514	3,047	527	3,127	524	3,111
1990/91	537	3,184	558	3,306	560	3,320
1991/92	563	3,328	589	3,483	599	3,542
1992/93	589	3,477	620	3,662	640	3,780
1993/94	616	3,634	653	3,852	684	4,033
1994/95	644	3,797	687	4,051	730	4,303
1995/96	674	3,968	724	4,261	780	4,591
1996/97	705	4,147	762	4,484	833	4,899
1997/98	738	4,333	803	4,718	890	5,227
1998/99	771	4,528	846	4,970	949	5,577
1999/00	806	4,732	893	5,242	1,014	5,951
2000/01	843	4,945	942	5,528	1,082	6,350
2001/02	881	5,168	994	5,829	1,155	6,775
2002/03	922	5,400	1049	6,142	1,235	7,229
2003/04	965	5,643	1,105	6,464	1,319	7,714
2004/05	1,008	5,897	1,163	6,801	1,407	8,230
2005/06	1,055	6,163	1,225	7,157	1,503	8,782
Average Annual Growth Rate						
1986/87- 1990/91	4.5%	4.9%	6.5%	6.7%	6.7%	6.9%
1990/91- 2000/01	4.5%	4.6%	5.3%	5.4%	6.7%	6.8%

Source : Feasibility Study for Geothermal Power Station
at North East Olkaria, Dec. 1989

Remark : (Gross Gen.)=(Net Gen.)+(Gen. Station Use)

**Table 4.6.3 Summary of Updated Load Forecast
(Update of NPDP)**

Fiscal Year (Jun/Jul)	Low Forecast		Median Forecast		High Forecast	
	Peak Load (MW)	Genera. Energy (GWh)	Peak Load (MW)	Genera. Energy (GWh)	Peak Load (MW)	Genera. Energy (GWh)
1988/89	480	2,904	480	2,904	480	2,904
1989/90	520	3,103	520	3,103	520	3,103
1990/91	566	3,187	566	3,187	566	3,187
1991/92	586	3,289	591	3,313	593	3,327
1992/93	615	3,446	629	3,520	737	3,566
1993/94	644	3,607	668	3,735	683	3,817
1994/95	675	3,775	710	3,963	733	4,084
1995/96	708	3,952	754	4,204	785	4,369
1996/97	741	4,137	801	4,459	841	4,672
1997/98	777	4,332	851	4,729	900	4,998
1998/99	815	4,538	903	5,017	964	5,346
1999/00	854	4,753	959	5,321	1,033	5,717
2000/01	895	4,980	1,018	5,643	1,106	6,115
2001/02	939	5,217	1,081	5,984	1,183	6,538
2002/03	984	5,465	1,147	6,344	1,267	6,990
2003/04	1,031	5,724	1,217	6,725	1,355	7,472
2004/05	1,081	5,996	1,291	7,127	1,450	7,986
2005/06	1,133	6,280	1,369	7,551	1,551	8,533
2006/07	1,187	6,576	1,451	8,000	1,658	9,117
2007/08	1,244	6,887	1,538	8,473	1,773	9,740
2008/09	1,303	7,211	1,630	8,973	1,895	10,404
2009/10	1,365	7,550	1,727	9,501	2,025	11,111
Average Annual Growth rate						
1989/90- 1999/00	5.08%	4.36%	6.31%	5.54%	7.10%	6.30%
1999/00- 2009/10	4.81%	4.74%	6.06%	5.97%	6.97%	6.87%

Source : 1990 Interim Update of National development Plan
1991 to 2010, Draft Final Report, Table 4.11,
April 1991, Acres

Table 4.7.1 Runoff Ratio of Perennial Rivers in Kenya

River Name	Catchment Area (sq.km)	Annual Rainfall (mm)	Annual Runoff (mm)	Runoff Ratio (%)
DRAINAGE AREA 1				
Sio	1,338	1,683	269	16.0
Nzoia	12,903	1,424	310	21.7
Yala	3,240	1,565	163	10.4
Nyando	3,356	1,298	222	17.1
Kibos	833	1,327	414	31.2
Awach Seme	717	1,191	373	31.4
Sondu	3,487	1,497	500	33.4
Gucha	6,824	1,444	266	18.5
Mara	8,608	1,037	217	20.9
DRAINAGE AREA 2				
Turkwel	19,906	532	22	4.1
Kerio	13,460	696	50	7.2
Lake Baringo	5,770	933	147	15.8
Lake Bogoria	1,220	747	121	16.2
Lake Nakuru	1,503	1,048	131	12.5
Lake Elementaita	551	789	133	16.9
Ewaso N'giro	8,652	832	47	5.7
DRAINAGE AREA 3				
Athi	37,836	733	17	2.3
Pemba	1,028	915	77	8.4
Mwachi	7,362	638	31	4.9
Rare	7,729	733	26	3.6
DRAINAGE AREA 4				
Tana	95,989	712	39	5.4
DRAINAGE AREA 5				
Ewaso N'giro (*)	12,107	707	28	3.9
Weighted Average				
	254,419	815	77	9.5

Note : (*) Archer's Post water level gauging station

Table 4.7.2 Balance between Water Demands and Potential Available Water (1/3)

Sub-Drainage Area	Demand			Safe Yield		Total (6) = (4)+(5)	Deficit			Major Demand Center
	1990	2000	2010	Surface Water	Ground-water		1990	2000	2010	
	(1)	(2)	(3)	(4)	(5)		(6)-(1)	(6)-(2)	(6)-(3)	
1AA	2,693	4,051	6,409	864	463	1,327	-1,366	-2,724	-5,082	Malakisi
1AB	3,061	5,014	7,935	864	393	1,257	-1,804	-3,757	-6,678	Malakisi
1AC	2,829	5,811	9,446	0	388	388	-2,441	-5,423	-9,058	Malakisi
1AD	2,154	3,581	5,388	12,096	666	12,762				
1AE	2,628	6,369	10,705	0	553	553	-2,075	-5,816	-10,152	Busia
1AF	5,469	10,676	17,134	0	1,326	1,326	-4,143	-9,350	-15,808	Nambate
1AG	5,906	10,918	17,794	0	1,190	1,190	-4,716	-9,728	-16,604	Nambate
1AH	7,625	12,201	19,295	0	2,096	2,096	-5,529	-10,105	-17,199	Busia
1BA	3,072	4,757	7,627	68,256	1,373	69,629				
1BB	4,101	5,846	9,197	60,480	2,694	63,174				
1BC	4,897	7,293	11,147	52,704	2,595	55,299				
1BD	2,978	3,808	5,650	56,160	1,117	57,277				
1BE	10,328	21,007	35,108	82,080	2,525	84,605				
1BG	9,106	17,042	27,469	75,168	1,952	77,120				
1BH	6,124	9,929	15,563	60,480	1,908	62,388				
1CA	3,236	4,223	6,722	69,120	834	69,954				
1CB	23,796	51,863	90,887	30,240	688	30,928		-20,935	-59,959	Eldoret
1CC	3,573	4,812	7,681	61,344	419	61,763				
1CD	3,023	4,134	5,701	109,728	1,054	110,782				
1CE	1,475	2,129	3,064	266,976	586	267,562				
1DA	5,987	10,298	15,878	763,776	1,750	765,526				
1DB	10,773	20,760	34,109	819,072	1,710	820,782				
1DC	4,980	7,479	11,629	864,864	1,095	865,959				
1DD	8,351	15,486	24,390	906,336	1,080	907,416				
1EA	4,735	7,797	12,234	2,592	1,351	3,943	-792	-3,854	-8,291	Kakamega
1EB	12,288	23,975	38,522	6,048	1,188	7,236	-5,052	-16,739	-31,286	Kakamega
1EC	2,937	4,253	6,627	27,648	787	28,435				
1ED	3,458	5,819	8,914	38,880	415	39,295				
1EE	6,160	8,488	12,990	981,504	1,437	982,941				
1EF	5,054	7,031	10,353	1,063,584	1,200	1,064,784				
1EG	12,138	17,491	26,691	1,029,888	1,888	1,031,776				
1FA	1,318	1,482	2,472	37,152	171	37,323				
1FB	2,742	4,386	6,525	69,120	832	69,952				
1FC	3,084	5,401	8,424	92,448	651	93,099				
1FD	6,062	9,353	14,195	139,968	646	140,614				
1FE	14,520	21,232	32,672	214,272	1,981	216,253				
1FF	12,049	18,524	28,819	245,376	788	246,164				
1FG	13,112	18,442	27,292	356,832	3,466	360,298				
1GA	2,094	2,866	4,471	24,192	249	24,441				
1GB	4,585	6,865	10,439	63,072	1,369	64,441				
1GC	7,335	11,068	17,583	0	713	713	-6,622	-10,355	-16,870	Londiani
1GD	8,100	12,416	19,514	127,008	2,589	129,597				
1GE	4,336	6,108	9,221	229,824	1,227	231,051				
1GF	3,365	4,296	6,706	286,848	1,029	287,877				
1GG	2,782	3,925	5,912	0	247	247	-2,535	-3,678	-5,665	Londiani
1HA	25,059	46,261	74,684	44,928	4,891	49,819			-24,865	Kisumu
1HB	28,469	49,722	78,324	47,520	2,554	50,074			-28,250	Maseno
1HC	4,273	5,218	6,884	49,248	1,462	50,710				
1HD	13,966	19,351	28,369	43,200	2,816	46,016				
1HE	13,500	18,635	27,686	49,248	2,507	51,755				
1HF	6,703	11,488	17,060	61,344	2,640	63,984				
1HG	1,340	1,760	2,336	33,696	799	34,495				
1JA	3,955	6,590	11,641	9,504	331	9,835			-1,806	Kericho
1JB	2,555	3,596	5,493	33,696	202	33,898				
1JC	7,465	14,721	23,969	25,920	258	26,178				
1JD	5,519	9,565	14,933	75,168	485	75,653				
1JE	5,994	8,169	11,940	50,112	1,266	51,378				
1JF	13,986	20,894	31,941	90,720	1,520	92,240				
1JG	4,653	5,896	8,661	188,352	1,143	189,495				
1KA	15,357	25,060	38,305	29,376	1,463	30,839			-7,466	Kisii
1KB	45,229	63,030	93,563	188,352	11,031	199,383				
1KC	21,913	32,557	45,936	380,160	9,609	389,769				
1LA1	6,445	9,707	15,437	29,376	1,068	30,444				
1LA2	3,232	4,781	6,246	159,840	2,363	162,203				
1LA3	2,474	3,640	4,719	584,928	7,094	592,022				
1LB1	7,099	10,634	16,664	55,296	2,092	57,388				
1LB2	2,466	3,601	4,618	366,336	6,349	372,685				
2AA	2,402	3,218	5,363	0	18,488	18,488				
2AB	5,478	9,492	16,514	0	25,335	25,335				
2BA	2,683	3,687	5,114	0	3,933	3,933			-1,181	Rural
2BB	1,603	2,093	2,692	0	6,607	6,607				
2BC	5,905	8,960	12,934	0	11,994	11,994			-940	Rural
2BD	8,067	14,860	25,206	122,688	45,466	168,154				
2CA	1,411	2,373	4,178	0	20,900	20,900				
2CB	8,924	13,669	20,712	0	4,897	4,897	-4,027	-8,772	-15,815	Iten & Kabarnet
2CC	8,042	12,852	20,488	0	35,730	35,730				
2D	6,073	8,727	13,466	0	22,136	22,136				

Note: Items (1), (2) and (3) indicate domestic and industrial water demands
Item (4) shows the safe yield with 10-year probability.

Table 4.7.2 Balance between Water Demands and Potential Available Water (2/3)

Sub-Drainage Area	Demand			Safe Yield			Deficit			Major Demand Center
	1990	2000	2010	Surface Water	Ground-water	Total (6) = (4)+(5)	1990	2000	2010	
	(1)	(2)	(3)	(4)	(5)	(6)	(6)-(1)	(6)-(2)	(6)-(3)	
2BA	1,958	2,893	5,442	0	297	297	-1,661	-2,596	-5,145	
2EB	2,775	3,885	7,545	0	506	506	-2,269	-3,379	-7,039	
2FC	6,748	11,845	33,905	0	676	676	-6,072	-11,169	-33,229	Rongai & Mogotio
2BD	2,276	3,404	5,627	0	241	241	-2,035	-3,163	-5,386	
2EE	1,258	1,853	2,609	0	784	784	-474	-1,069	-1,825	
2EF	1,927	3,452	5,404	0	591	591	-1,336	-2,861	-4,813	Eldama Ravine
2EG1	4,644	7,962	15,614	0	389	389	-4,255	-7,573	-15,225	Molo & Elburgon
2EG2	2,698	3,996	6,162	0	2,006	2,006	-692	-1,990	-4,156	
2EH	1,940	3,271	5,068	0	1,087	1,087	-853	-2,184	-3,981	
2EJ	1,915	2,701	4,324	0	2,859	2,859			-1,465	
2EK	1,473	2,106	3,534	0	758	758	-715	-1,348	-2,776	
2FA	2,772	5,008	14,035	864	867	1,731	-1,041	-3,277	-12,304	Gilgil
2FB	913	1,297	2,601	0	56	56	-857	-1,241	-2,545	
2FC	41,664	97,672	161,735	0	1,510	1,510	-40,154	-96,162	-160,225	Nakuru & Njoro
2GA	2,456	5,235	9,340	0	699	699	-1,757	-4,536	-8,641	
2GB	7,293	13,201	20,590	14,688	1,087	15,775			-4,815	
2GC	3,813	6,053	9,160	0	848	848	-2,965	-5,205	-8,312	Gilgil
2GD	7,213	15,654	29,282	3,456	2,402	5,858	-1,355	-9,796	-23,424	Naivasha
2H	11,892	18,401	27,396	0	12,010	12,010		-6,391	-15,386	Magadi
2J	6,035	10,218	17,824	0	80,188	80,188				
2KA	15,351	26,937	41,830	69,984	6,571	76,555				
2KB	1,863	2,661	3,419	0	1,841	1,841	-22	-820	-1,578	Rural
2KC	1,508	2,499	3,618	0	4,433	4,433				
3AA	98,564	165,510	242,896	4,320	283	4,603	-93,961	-160,907	-238,293	Athi River
3AB	3,898	7,519	11,487	2,592	2,468	5,060	1,162	-2,459	-6,427	Nairobi
3AC	48,428	84,038	124,881	864	847	1,711	-46,717	-82,327	-123,170	Nairobi
3BA	204,582	340,091	495,248	21,600	392	21,992	-182,590	-318,099	-473,256	Nairobi,ruiru,Kiambu
3BB	11,276	18,033	26,773	28,512	131	28,643				
3BC	7,155	11,411	17,766	25,920	464	26,384				
3BD	4,911	7,551	11,531	19,008	328	19,336				
3CB	9,261	17,541	27,629	28,512	410	28,922				
3DA	5,983	9,804	14,511	5,184	2,045	7,229		-2,575	-7,282	
3DB	1,699	2,248	2,970	1,728	2,304	4,032				
3BA	22,880	47,525	78,110	1,728	2,607	4,335	-18,545	-43,190	-73,775	Machakos
3BB	5,104	7,042	10,020	1,728	2,694	4,422	-682	-2,620	-5,598	
3EC	4,342	5,903	8,377	0	2,409	2,409	-1,933	-3,494	-5,968	
3ED	1,344	1,830	2,564	0	1,893	1,893			-671	
3FA	15,092	21,531	30,420	11,232	32,474	43,706				
3FB	3,680	5,179	7,365	864	12,383	13,247				
3G	6,641	9,870	14,265	309,312	18,131	327,443				
3HA	572	745	1,011	9,504	4,352	13,856				
3HB	513	706	921	27,648	11,307	38,955				
3HC	1,035	1,424	1,977	31,968	11,664	43,632				
3HD1	1,789	3,097	4,742	864	2,700	3,564			-1,178	
3HD2	186	285	413	0	1,799	1,799				
3J	3,524	5,393	7,350	0	11,740	11,740				
3K	10,470	16,188	23,071	0	21,280	21,280			-1,791	
3LA	7,867	12,409	18,124	0	26,292	26,292				
3LB	9,148	20,744	34,689	6,912	2,626	9,538		-11,206	-25,151	Mulindi
3MA	3,540	4,278	5,477	4,320	19,369	23,689				
3MB	5,327	8,292	11,185	38,016	6,041	44,057				
3MC	1,612	2,909	3,929	0	3,737	3,737			-192	Mombasa
3MD1	106,128	161,234	217,066	0	4,870	4,870	-101,258	-156,364	-212,196	Mombasa
3MD2	1,023	1,354	1,825	0	599	599	-424	-755	-1,226	Mombasa
3N	2,932	4,755	7,217	0	11,680	11,680				
4AA	2,905	3,768	5,866	42,336	217	42,553				
4AB	12,070	25,947	44,069	25,056	451	25,507		-440	-18,562	
4AC	10,133	17,674	29,295	203,040	184	203,224				
4AD	6,661	9,321	14,793	864	316	1,180	-5,481	-8,141	-13,613	
4BA	6,265	8,406	12,892	27,648	405	28,053				
4BB	3,263	4,470	6,945	23,328	143	23,471				
4BC	2,922	4,206	6,331	19,008	204	19,212				
4BD	10,472	15,987	24,814	537,408	1,431	538,839				
4BE	11,060	17,384	26,151	183,168	501	183,669				
4BF	7,769	12,222	17,875	153,792	593	154,385				
4BG	1,191	1,531	2,127	146,016	1,225	147,241				
4CA	6,389	10,318	16,010	184,032	530	184,562				
4CB	4,473	6,121	9,508	99,360	268	99,628				
4CC	8,567	13,844	20,779	162,432	2,295	164,727				
4DA	9,516	15,351	23,823	66,528	669	67,197				
4DB	3,359	4,887	7,461	19,872	601	20,473				
4DC	6,607	12,382	19,867	43,200	411	43,611				
4DD	1,043	1,458	2,010	16,416	1,027	17,443				
4DE	1,312	1,818	2,422	57,024	3,064	60,088				
4EA	5,603	8,195	12,058	35,424	1,487	36,911				
4EB	9,972	14,859	22,316	2,592	2,305	4,897	-5,075	-9,962	-17,419	
4EC	4,850	7,160	10,598	6,912	1,426	8,338			-2,260	

Note: Items (1), (2) and (3) indicate domestic and industrial water demands
Item (4) shows the safe yield with 10-year probability.

Table 4.7.2 Balance between Water Demands and Potential Available Water (3/3)

Sub-Drainage Area	Demand			Safe Yield		Total (6) = (4)+(5)	Deficit			Major Demand Center
	1990	2000	2010	Surface Water	Ground-water		1990	2000	2010	
	(1)	(2)	(3)	(4)	(5)		(6)-(1)	(6)-(2)	(6)-(3)	
4ED	6,173	8,926	12,308	7,459,776	11,361	7,471,137				
4FA	23,972	47,231	75,695	7,635,168	4,140	7,639,308				
4FB	7,861	10,932	15,192	7,681,824	10,676	7,692,500				
4QA	3,231	4,431	7,303	7,752,672	14,047	7,766,719				
4QB	1,628	1,883	2,760	7,567,776	18,192	7,585,968				
4GC	1,879	4,320	6,921	7,531,488	5,847	7,537,335				
4GD	2,218	2,937	3,816	6,732,288	24,437	6,756,725				
4GE	4,733	7,318	10,075	6,380,640	41,208	6,421,848				
4GF	7,672	11,087	14,998	5,828,544	51,580	5,880,124				
4GG	3,354	4,764	6,748	5,205,600	31,545	5,237,145				
4HA	9,584	14,490	20,207	10,368	18,714	29,082				
4HB	1,496	2,153	2,781	0	43,453	43,453				
4HC	541	869	1,166	0	33,798	33,798				
4JA	3,539	7,643	12,299	0	28,454	28,454				
4JB	829	1,141	1,728	0	14,214	14,214				
4KA	1,616	2,625	4,149	0	25,929	25,929				
4KB	2,029	3,190	4,954	0	34,151	34,151				
5AA	9,218	16,074	26,214	1,728	1,321	3,049	-6,169	-13,025	-23,165	Nyahururu & Rumuruti
5AB	1,441	2,033	2,954	2,592	455	3,047				
5AC	1,842	2,822	4,814	0	1,744	1,744	-98	-1,078	-3,070	Rumuruti
5AD	405	556	938	0	907	907			-31	
5BA	376	438	721	12,960	125	13,085				
5BB	816	864	1,373	39,744	461	40,205				
5BC	3,245	6,010	10,367	45,792	2,824	48,616				
5BD	649	918	1,402	17,280	805	18,085				
5BE	3,121	6,304	11,166	4,320	2,636	6,956			-4,210	
5CA	4,870	9,740	17,028	0	3,418	3,418	-1,452	-6,322	-13,610	
5CB	1,037	1,443	2,198	0	7,145	7,145				
5CC	1,535	2,540	4,202	0	9,441	9,441				
5DA	4,020	8,239	15,128	108,000	8,306	116,306				
5DB	1,096	1,897	3,339	132,192	3,579	135,771				
5DC	1,593	3,388	6,118	175,392	2,894	178,286				
5DD	1,056	2,084	3,557	134,784	5,553	140,337				
5EA	11,215	18,330	29,034	0	80,810	80,810				
5EB	5,806	7,623	12,344	0	77,493	77,493				
5EC	5,834	7,993	13,722	0	73,003	73,003				
5ED	15,309	24,646	42,110	0	59,375	59,375				
5FA	5,057	6,524	10,216	0	76,655	76,655				
5FB	517	553	743	0	29,255	29,255				
5GA	8,689	11,906	17,344	0	70,922	70,922				
5GB	2,757	4,188	6,447	0	9,725	9,725				
5H	2,973	3,925	5,727	0	18,051	18,051				
5J	10,116	16,349	27,545	0	55,378	55,378				

Note: Items (1), (2) and (3) indicate domestic and industrial water demands
 Item (4) shows the safe yield with 10-year probability.

Table 5.2.1 Relationship between Probable Daily Discharges and Flow Duration Curve on Monthly Discharge Basis

Station No.	Nos. of Years	Annual Average Discharge (cms)	2-yr Drought		5-yr Drought		10-yr Drought		Min. Discharge		No. of Records		Ratio 100(1-b/a) (%)
			Discharge (cms)	Ratio (%)	Discharge (cms)	Ratio (%)	Discharge (cms)	Ratio (%)	Daily (cms)	Monthly (cms)	(a) (days)	(b) (days)	
IBA01	18	1.1	0.24	89.1	0.18	98.2	0.15	98.4	0.10	0.10	6,559	0	100.0
IFE02	22	16.6	2.01	99.2	1.01	100.0	0.73	100.0	0.57	1.90	8,018	150	98.1
IKC03	17	16.0	0.19	99.6	0.05	100.0	0.00	100.0	0.00	0.10	6,156	19	99.7
ILA03	16	11.2	0.52	97.3	0.21	100.0	0.12	100.0	0.10	0.20	5,815	9	99.8
2C 05	19	2.2	0.56	97.1	0.39	100.0	0.32	100.0	0.19	0.50	6,921	121	98.3
4BC02	16	30.5	7.96	98.2	6.36	100.0	5.70	100.0	5.07	6.30	5,780	30	99.5
4CA02	19	8.9	2.32	95.1	1.81	99.1	1.58	100.0	1.58	1.70	6,896	31	99.6
4CB04	25	6.4	0.93	96.6	0.58	99.7	0.45	100.0	0.39	0.50	9,091	32	99.6
4DA02	16	1.8	0.27	98.6	0.15	99.7	0.13	99.9	0.09	0.10	5,817	1	100.0
4DD01	15	26.2	5.81	99.0	3.75	100.0	2.79	100.0	2.60	4.40	5,408	75	98.6
4G 01	22	169.6	34.04	98.1	20.11	99.9	14.01	100.0	8.83	18.20	7,996	30	99.6
4G 04	16	142.5	28.85	89.6	12.07	94.2	4.11	98.3	0.18	1.10	5,820	45	99.2
5AB04	16	6.4	2.07	90.8	1.29	99.7	1.10	99.7	0.49	0.50	5,822	2	100.0
5AC08	28	3.2	0.24	91.8	0.13	98.1	0.10	100.0	0.09	0.10	10,160	37	99.6
5E 03	17	16.6	1.06	93.8	0.26	99.6	0.00	100.0	0.00	0.10	6,150	21	99.7
Ave.	19	30.6		95.6		99.2		99.8				40.2	99.4

Note : Discharge : daily discharge basis (cms)

Ratio : ratio on flow duration curve prepared on basis of monthly average discharges (%)

(a) : number of daily discharge data examined

(b) : number of days of which the daily discharge is less than the minimum monthly discharge

Table 5.5.1 Monthly Mean Basin Flow (1/5)
Drainage Area 1

Unit: m3/sec

Basin	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1AA	0.735	0.616	0.854	1.755	2.843	2.044	1.585	1.755	1.874	2.095	2.214	1.245
1AB	0.796	0.67	0.922	1.876	3.028	2.182	1.696	1.876	2.002	2.236	2.362	1.336
1AC	0.199	0.15	0.248	0.619	1.067	0.738	0.549	0.619	0.668	0.759	0.808	0.409
1AD	1.597	1.303	1.891	4.117	6.805	4.831	3.697	4.117	4.411	4.957	5.251	2.857
1AE	0.307	0.251	0.363	0.787	1.299	0.923	0.707	0.787	0.843	0.947	1.003	0.547
1AF	0.846	0.63	0.954	4.842	8.766	5.994	3.006	2.538	3.042	3.618	4.122	2.106
1AG	0.718	0.532	0.811	4.159	7.538	5.151	2.578	2.175	2.609	3.105	3.539	1.803
1AH	2.845	2.149	3.193	15.721	28.365	19.433	9.805	8.297	9.921	11.777	13.401	6.905
1BA	0.761	0.961	0.961	2.061	4.761	1.961	2.761	5.261	2.761	1.761	2.761	2.261
1BB	5.998	6.298	6.298	8.398	12.198	8.898	11.798	17.598	12.898	9.698	10.798	8.098
1BC	3.72	4.62	4.32	6.12	7.62	8.42	11.32	14.72	12.72	6.82	6.52	4.12
1BD	9.929	10.663	11.448	15.623	22.488	18.914	26.507	40.727	30.938	17.772	18.71	16.085
1BE	8.801	9.926	9.647	13.533	18.908	16.337	22.165	31.309	24.643	15.587	16.284	11.223
1BG	11.375	11.951	12.225	17.399	27.63	23.097	33.396	52.063	41.245	23.813	23.725	24.846
1BH	1.355	1.255	0.955	1.655	4.055	2.855	3.955	6.255	6.855	4.655	4.455	8.155
1CA	1.001	0.701	1.801	2.001	3.201	2.301	4.201	8.601	5.401	1.901	2.401	4.601
1CB	0.164	0.064	0.264	1.764	3.264	1.864	3.164	8.364	5.464	2.064	1.764	3.864
1CC	1.808	1.308	1.708	3.308	4.608	3.408	3.908	9.408	8.508	4.208	3.808	6.608
1CD	3.121	2.421	3.021	5.921	8.621	6.321	7.321	17.621	15.421	7.621	6.421	11.321
1CE	4.646	3.446	5.646	10.446	16.346	11.346	16.246	38.046	28.646	12.346	11.346	21.446
1DA	20.879	21.05	22.578	36.747	62.999	47.943	67.819	112.13	89.553	50.852	50.055	60.152
1DB	2.003	2.103	1.503	2.503	6.503	3.803	4.603	7.103	9.703	7.203	7.803	14.803
1DC	23.99	24.122	24.749	40.519	72.397	53.752	74.631	122.82	103.67	61.414	61.238	82.052
1DD	25.085	25.039	25.406	41.717	75.367	55.775	76.833	126.6	108.25	64.9	64.677	89.446
1EA	5.668	6.068	4.968	9.168	16.168	14.468	20.268	22.668	16.968	12.768	11.768	7.668
1EB	8.609	9.209	7.609	14.509	26.209	23.009	30.509	34.909	26.509	20.409	18.709	12.009
1EC	2.205	2.205	2.105	4.005	7.405	6.205	6.605	8.205	6.705	5.605	5.105	3.205
1ED	12.12	12.62	10.92	20.62	37.82	32.62	40.52	47.62	36.92	29.32	26.72	17.02
1EE	40.568	40.502	39.373	68.263	123.29	95.415	124.68	183.95	153.78	102.07	99.741	111.63
1EF	47.878	45.906	45.47	80.058	141.9	106.41	136.96	200.28	168.68	116.45	117.57	122.67
1EG	4.547	3.647	3.947	7.647	12.947	8.747	9.147	12.047	10.547	9.847	11.047	6.847
1FA	0.868	0.568	0.868	1.468	1.968	1.568	1.468	3.868	4.168	2.068	1.768	2.868
1FB	2.283	1.583	2.183	3.783	5.083	4.083	3.783	9.583	10.783	5.483	4.483	7.483
1FC	3.287	2.387	3.187	5.487	7.487	5.887	5.487	14.087	15.887	8.087	6.587	11.087
1FD	5.274	3.78	5.098	8.69	11.636	9.292	8.485	21.784	24.716	12.637	10.331	17.294
1FE	9.898	8.398	12.698	26.198	31.998	27.598	22.598	38.598	39.098	25.998	20.198	23.198
1FF	1.52	1.52	2.72	5.62	5.62	3.92	2.72	3.32	3.32	3.32	3.92	2.72
1FG	16.758	13.458	22.958	49.258	52.758	38.758	30.158	48.958	50.358	39.358	36.558	33.358
1GA	0.664	0.608	0.719	1.548	2.377	1.603	2.321	5.195	3.592	1.714	1.548	2.708
1GB	6.95	8.372	8.056	17.536	25.436	16.43	18.958	26.542	22.118	14.218	10.9	8.372
1GC	3.349	4.042	3.888	8.508	12.358	7.969	9.201	12.897	10.741	6.891	5.274	4.042
1GD	9.328	11.245	10.819	23.599	34.249	22.108	25.516	35.74	29.776	19.126	14.653	11.245
1GE	0.514	0.469	0.559	1.23	1.901	1.274	1.856	4.182	2.885	1.364	1.23	2.169
1GF	0.33	0.301	0.358	0.793	1.227	0.822	1.198	2.703	1.864	0.88	0.793	1.401
1GG	0.584	0.534	0.634	1.384	2.134	1.434	2.084	4.684	3.234	1.534	1.384	2.434
1HA	5.742	5.742	6.542	12.442	17.642	13.942	10.242	10.942	11.642	8.742	7.942	7.942
1HB	3.755	4.355	4.855	11.055	14.355	11.555	5.855	7.455	9.455	7.355	6.855	5.755
1HC	2.481	2.381	2.881	6.481	8.181	5.981	3.181	4.281	5.381	4.581	4.181	3.281
1HD	3.262	2.562	5.362	12.662	24.162	15.562	7.262	9.062	10.662	8.762	6.862	6.262
1HE	2.693	2.093	4.293	10.893	20.193	11.893	5.293	7.093	8.593	7.393	5.793	5.293
1HF	3.002	2.202	4.102	12.202	21.402	8.802	3.602	6.702	8.002	8.102	6.402	5.902
1HG	1.652	1.252	2.252	6.352	10.752	4.352	1.652	2.752	3.252	3.652	3.452	3.452
1JA	4.778	3.878	7.878	17.478	25.178	23.878	21.778	29.178	26.578	11.778	9.178	10.078
1JB	6.588	5.462	11.063	23.733	32.844	30.976	27.198	36.622	33.888	15.657	12.407	13.776
1JC	9.183	7.313	12.801	27.322	44.16	40.537	33.903	45.152	44.1	21.046	16.517	17.881
1JD	10.677	8.277	13.677	29.477	51.177	46.177	37.377	49.777	50.277	24.377	18.977	20.377
1JE	2.434	2.034	1.434	6.934	7.934	6.034	2.834	2.734	4.934	2.834	10.234	13.234
1JF	3.956	2.956	2.556	16.956	25.556	19.056	12.956	11.356	16.856	10.656	18.456	18.156
1JG	18.791	14.491	19.791	58.991	94.291	77.491	56.391	67.991	75.691	41.191	50.291	54.491
1KA	1.314	3.714	5.814	13.114	21.314	9.514	3.514	2.614	5.114	3.614	6.614	4.814
1KB	23.514	21.244	37.394	97.325	132.73	59.625	21.868	26.43	37.025	33.889	35.74	44.712
1KC	10.591	11.491	20.091	50.691	50.091	16.491	5.391	2.491	5.091	4.291	9.391	17.691
1LA	4.254	4.854	7.354	25.754	33.154	20.354	20.354	24.054	27.154	16.254	9.954	10.454
1LA	13.817	15.017	22.917	70.317	80.217	46.717	42.317	49.017	55.317	33.717	24.717	30.017
1LA	36.575	32.675	53.175	139.18	137.28	69.075	50.575	52.275	60.375	36.675	36.175	59.075
1LB	5.497	6.397	9.297	29.797	34.497	21.397	20.097	24.097	26.897	16.597	12.197	13.597
1LB	10.081	7.981	13.581	31.181	25.381	9.981	3.781	1.481	2.181	1.381	5.181	12.981

Table 5.5.1 Monthly Mean Basin Flow (2/5)
Drainage Area 2

Unit: m3/sec

Basin	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2AA	0	0	0	0	0	0	0	0	0	0	0	0
2AB	0	0	0	0	0	0	0	0	0	0	0	0
2BA	3.521	3.136	3.796	4.676	6.216	5.061	6.656	8.581	7.041	6.051	5.501	4.401
2BB	6.367	5.674	6.862	8.446	11.218	9.139	12.01	15.475	12.703	10.921	9.931	7.951
2BC	10.246	10.78	10.246	15.586	20.748	18.434	21.282	26.622	22.172	19.858	19.858	14.518
2BD	0	0	0	0	0	0	0	0	0	0	0	0
2CA	0	0	0	0	0	0	0	0	0	0	0	0
2CB	3.083	4.463	5.015	8.534	9.638	8.258	8.258	8.81	7.982	6.326	6.602	3.911
2CC	0	0	0	0	0	0	0	0	0	0	0	0
2D	0	0	0	0	0	0	0	0	0	0	0	0
2EA	0.35	0.392	0.35	0.63	0.91	0.791	0.826	1.267	1.148	0.672	0.469	0.511
2EB	0.704	0.76	0.592	1.194	1.978	1.754	1.586	2.258	2.09	1.362	1.082	1.138
2EC	0.723	0.795	0.579	1.353	2.361	2.073	1.857	2.721	2.505	1.569	1.209	1.281
2ED	0.945	1.065	0.945	1.745	2.545	2.205	2.305	3.565	3.225	1.865	1.285	1.405
2EE	1.326	1.506	1.326	2.526	3.726	3.216	3.366	5.256	4.746	2.706	1.836	2.016
2EF	0.156	0.186	0.156	0.356	0.556	0.471	0.496	0.811	0.726	0.386	0.241	0.271
2EG	0.117	0.147	0.117	0.317	0.517	0.432	0.457	0.772	0.687	0.347	0.202	0.232
2EG	1.286	1.402	1.054	2.301	3.925	3.461	3.113	4.505	4.157	2.649	2.069	2.185
2EH	1.17	1.314	1.17	2.13	3.09	2.682	2.802	4.314	3.906	2.274	1.578	1.722
2EJ	1.493	1.609	1.261	2.508	4.132	3.668	3.32	4.712	4.364	2.856	2.276	2.392
2EK	0.501	0.561	0.501	0.901	1.301	1.131	1.181	1.811	1.641	0.961	0.671	0.731
2FA	0.344	0.232	0.449	0.876	1.093	0.344	0.554	1.093	0.988	0.232	0.344	0.771
2FB	0.494	0.366	0.614	1.102	1.35	0.494	0.734	1.35	1.23	0.366	0.494	0.982
2FC	1.446	0.342	2.481	6.69	8.829	1.446	3.516	8.829	7.794	0.342	1.446	5.655
2GA	0.09	0.026	0.15	0.394	0.518	0.09	0.21	0.518	0.458	0.026	0.09	0.334
2GB	1.591	1.231	1.471	2.831	4.511	3.911	4.871	6.191	6.071	4.631	3.911	2.831
2GC	1.056	0.813	0.921	1.974	3.351	3	3.351	4.269	4.269	3.351	2.892	1.974
2GD	0.745	0.489	0.985	1.961	2.457	0.745	1.225	2.457	2.217	0.489	0.745	1.721
2H	0	0	0	0	0	0	0	0	0	0	0	0
2J	0	0	0	0	0	0	0	0	0	0	0	0
2KA	16.143	9.123	16.683	60.153	56.913	18.843	20.193	27.753	26.673	12.903	32.613	22.353
2KB	18.612	10.526	19.234	69.305	65.573	21.722	23.277	31.985	30.741	14.88	37.583	25.765
2KC	22.11	12.516	22.848	82.257	77.829	25.8	27.645	37.977	36.501	17.682	44.619	30.597

Table 5.5.1 Monthly Mean Basin Flow (3/5)
Drainage Area 3

Unit: m3/sec

Basin	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3AA	0.981	0	0.421	6.381	9.501	0.981	0	0	0	0	9.781	3.541
3AB	6.233	3.741	4.987	18.248	25.19	6.233	1.783	0.537	0.537	0.537	25.813	11.929
3AC	7.635	3.164	5.268	35.776	74.963	25.256	9.739	4.479	0.797	0	37.091	14.473
3BA	4.563	2.811	3.541	16.827	33.179	12.009	6.899	4.125	3.541	3.687	14.053	10.841
3BB	1.196	0.91	1.064	2.714	4.76	2.56	1.746	1.328	0.91	0.778	2.846	1.746
3BC	3.449	2.747	3.125	7.175	12.197	6.797	4.799	3.773	2.747	2.423	7.499	4.799
3BD	2.946	2.361	2.676	6.051	10.236	5.736	4.071	3.216	2.361	2.091	6.321	4.071
3CB	2.146	1.054	1.574	11.974	18.422	5.994	2.822	1.47	0.95	0.95	5.474	4.798
3DA	8.856	3.841	6.201	40.421	84.376	28.621	11.216	5.316	1.186	0	41.896	16.526
3DB	10.666	5.124	7.732	45.548	94.122	32.508	13.274	6.754	2.19	0.56	47.178	19.142
3EA	0	0	0	0.754	1.612	0	0	0	0	0	1.689	0
3EB	0	0	0	2.609	4.247	0	0	0	0	0	4.394	1.118
3EC	0.404	0.18	0.292	1.484	2.108	0.404	0.004	0	0	0	2.164	0.916
3ED	0.713	0	0.195	5.708	8.594	0.713	0	0	0	0	8.853	3.081
3FA	13.189	8.866	16.726	87.859	76.069	28.123	11.617	4.543	0.22	2.578	53.668	34.018
3FB	12.948	8.647	16.467	87.238	75.508	27.806	11.384	4.346	0.045	2.391	53.221	33.671
3G	5.685	5.585	6.085	8.085	5.085	5.185	4.985	4.885	4.885	4.985	9.085	7.985
3HA	4.048	4.407	0	87.493	45.65	34.141	19.993	2.009	0	26.108	152.71	29.705
3HB	2.579	2.905	0	78.166	40.264	29.839	17.023	0.733	0	22.562	137.25	25.82
3HC	6.176	1.576	4.576	4.976	4.176	5.876	2.776	1.076	1.076	2.776	4.576	17.376
3HD1	3.238	3.581	0	82.754	42.882	31.914	18.433	1.296	0	24.26	144.91	27.687
3HD2	1.011	0.244	0.744	0.811	0.678	0.961	0.444	0.161	0.161	0.444	0.744	2.878
3HD3	0.757	0	0.457	0.532	0.382	0.701	0.119	0	0	0.119	0.457	2.857
3J	8.62	8.471	9.217	12.2	7.725	7.874	7.576	7.427	7.427	7.576	13.692	12.051
3K	17.557	3.257	9.557	8.557	6.757	6.657	2.957	1.357	1.157	5.757	8.257	29.557
3L	8.311	1.411	5.311	3.311	2.011	2.411	0.511	0	0	1.411	3.511	17.311
3MA	1.566	1.607	3.156	3.114	4.663	1.859	0.938	0.603	0.98	2.486	3.24	3.784
3MB	2.786	2.861	5.636	5.561	8.336	3.311	1.661	1.061	1.736	4.436	5.786	6.761
3MC	1.287	1.322	2.613	2.578	3.869	1.531	0.764	0.485	0.799	2.055	2.683	3.136
3MD	3.53	3.68	9.23	9.08	14.63	4.58	1.28	0.08	1.43	6.83	9.53	11.48
3N	1.102	0.99	1.401	1.738	0.952	0.803	0.803	0.728	0.728	0.84	3.272	2.748

Table 5.5.1 Monthly Mean Basin Flow (4/5)
Drainage Area 4

Unit: m3/sec

Basin	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4AA	4.095	4.095	4.095	11.867	13.274	6.239	4.095	3.425	3.425	6.909	10.46	6.909
4AB	2.618	2.336	2.618	8.117	8.634	3.182	2.336	2.9	2.336	4.263	7.835	4.545
4AC	8.018	7.728	8.163	24.693	27.883	12.368	7.873	8.598	7.583	13.528	22.953	14.833
4AD	2.261	2.027	1.871	5.147	8.774	4.289	2.651	2.456	2.144	3.197	5.459	3.704
4BA	14.293	11.653	11.653	37.261	63.661	30.397	17.461	16.669	12.973	20.629	38.317	26.701
4BB	3.125	2.597	2.465	6.205	9.857	5.325	3.521	2.861	2.333	3.389	5.457	4.137
4BC	2.37	1.95	1.95	6.024	10.224	4.932	2.874	2.748	2.16	3.378	6.192	4.344
4BD	3.91	3.16	3.16	10.435	17.935	8.485	4.81	4.585	3.535	5.71	10.735	7.435
4BE	36.909	26.793	34.661	74.563	131.89	69.505	43.653	35.785	30.727	39.719	68.943	51.521
4BF	2.28	1.85	1.85	6.021	10.321	4.903	2.796	2.667	2.065	3.312	6.193	4.301
4BG	43.114	31.324	40.494	86.999	153.81	81.104	50.974	41.804	35.909	46.389	80.449	60.144
4CA	3.052	2.116	2.22	7.576	13.868	7.212	4.196	2.844	2.168	2.48	6.224	5.184
4CB	1.739	1.026	1.026	4.746	8.9	4.25	2.266	1.398	1.057	1.305	4.064	3.196
4CC	10.118	6.024	6.024	27.384	51.236	24.536	13.144	8.16	6.202	7.626	23.468	18.484
4DA	5.352	4.68	4.176	8.712	16.44	11.232	7.704	7.032	6.36	7.956	10.56	7.284
4DB	4.207	3.687	3.297	6.807	12.787	8.757	6.027	5.507	4.987	6.222	8.237	5.702
4DC	2.086	1.744	1.554	3.834	7.216	4.632	3.112	2.808	2.428	3.568	4.974	3.036
4DD	13.407	10.407	9.157	31.407	54.657	34.407	21.157	18.157	15.907	26.157	35.157	20.157
4DE	79.66	58.528	65.572	174.75	238.15	141.88	84.356	70.268	57.354	82.008	167.71	143.06
4EA	14.025	11.715	10.945	19.415	24.805	14.795	10.945	8.789	8.019	10.175	25.575	20.185
4EB	10.538	7.422	8.406	25.298	39.402	15.786	8.406	7.422	5.29	12.342	34.482	18.246
4EC	5.434	3.819	4.329	13.084	20.394	8.154	4.329	3.819	2.714	6.369	17.844	9.429
4ED	117.65	86.469	96.861	257.94	351.47	209.44	124.57	103.79	84.737	121.11	247.55	211.17
4FA	130.84	95.987	107.6	287.65	392.2	233.44	138.58	115.35	94.051	134.71	276.04	235.38
4FB	126.62	92.796	104.07	278.82	380.28	226.21	134.13	111.59	90.917	130.38	267.54	228.08
4GA	131.7	87.368	89.215	279.46	416.13	224.05	124.31	94.756	72.592	98.45	275.76	242.52
4GB	125.38	83.065	84.828	266.42	396.88	213.53	118.33	90.117	68.961	93.643	262.89	231.16
4GC	120.93	79.961	81.668	257.49	383.81	206.28	114.1	86.789	66.305	90.203	254.08	223.35
4GD	101.53	69.883	78.139	182.72	287.29	190.97	97.403	72.635	60.251	65.755	175.84	182.72
4GE	88.395	60.496	67.774	159.96	252.15	167.24	84.756	62.922	52.005	56.857	153.9	159.96
4GF	68.76	46.542	52.338	125.75	199.17	131.55	65.862	48.474	39.78	43.644	120.92	125.75
4GG	47.414	31.291	35.497	88.773	142.05	92.979	45.311	32.693	26.384	29.188	85.268	88.773
4HA	2.052	1.827	2.65	3.324	1.752	1.453	1.453	1.303	1.303	1.528	6.392	5.344
4HB	1.613	1.429	2.105	2.658	1.367	1.122	1.122	0.999	0.999	1.183	5.179	4.318
4JA	0	0	0	0	0	0	0	0	0	0	0	0
4JB	0.325	0.333	0.656	0.647	0.97	0.386	0.194	0.124	0.202	0.516	0.673	0.787
4KA	1.028	1.056	2.089	2.061	3.094	1.224	0.61	0.387	0.638	1.642	2.145	2.508
4KB	0.78	0.801	1.575	1.554	2.329	0.926	0.466	0.298	0.487	1.24	1.617	1.889

Table 5.5.1 Monthly Mean Basin Flow (5/5)
Drainage Area 5

Unit: m3/sec

Basin	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
5AA	0.28	0.046	0	1.437	0.878	0.124	0.878	1.697	1.32	0.28	1.775	1.216
5AB	0.254	0.164	0.139	0.699	0.484	0.194	0.484	0.799	0.654	0.254	0.829	0.614
5AC	1.624	0.958	0.773	4.917	3.326	1.18	3.326	5.657	4.584	1.624	5.879	4.288
5AD	0.287	0.197	0.172	0.732	0.517	0.227	0.517	0.832	0.687	0.287	0.862	0.647
5BA	0.723	0.563	0.483	1.379	1.139	0.563	0.483	0.563	0.563	0.483	1.379	1.139
5BB	0.98	0.76	0.65	1.882	1.552	0.76	0.65	0.76	0.76	0.65	1.882	1.552
5BC	2.307	2.451	2.547	7.443	7.587	3.123	2.547	3.507	3.315	3.555	8.979	6.819
5BD	0.743	0.785	0.813	2.241	2.283	0.981	0.813	1.093	1.037	1.107	2.689	2.059
5BE	2.12	1.6	1.34	4.252	3.472	1.6	1.34	1.6	1.6	1.34	4.252	3.472
5CA	1.784	1.208	1.048	4.632	3.256	1.4	3.256	5.272	4.344	1.784	5.464	4.088
5CB	3.75	2.562	2.232	9.624	6.786	2.958	6.786	10.944	9.03	3.75	11.34	8.502
5CC	2.011	1.381	1.206	5.126	3.621	1.591	3.621	5.826	4.811	2.011	6.036	4.531
5DA	8.936	7.224	9.578	38.04	28.41	12.574	11.504	17.924	15.784	15.142	45.102	27.768
5DB	3.279	2.559	2.199	6.231	5.151	2.559	2.199	2.559	2.559	2.199	6.231	5.151
5DC	6.442	6.868	7.152	21.636	22.062	8.856	7.152	9.992	9.424	10.134	26.18	19.79
5DD	9.943	10.567	10.983	32.199	32.823	13.479	10.983	15.143	14.311	15.351	38.855	29.495
5EA	0	0	0	0	0	0	0	0	0	0	0	0
5EB	0	0	0	0	0	0	0	0	0	0	0	0
5EC	0	0	0	0	0	0	0	0	0	0	0	0
5FA	0	0	0	0	0	0	0	0	0	0	0	0
5FB	0	0	0	0	0	0	0	0	0	0	0	0
5G	0	0	0	0	0	0	0	0	0	0	0	0
5H	0	0	0	0	0	0	0	0	0	0	0	0
5J	0	0	0	0	0	0	0	0	0	0	0	0

Table 5.5.2 Monthly Unit Irrigation Demand by Sub-basin (1/5)

Drainage Area 1

Unit: m3/sec

Basin	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1AA	0.829	0.728	0.590	0.054	0.000	0.000	0.343	0.317	0.698	0.366	0.324	0.541
1AB	0.829	0.728	0.590	0.054	0.000	0.000	0.343	0.317	0.698	0.366	0.324	0.541
1AC	0.829	0.728	0.590	0.054	0.000	0.000	0.343	0.317	0.698	0.366	0.324	0.541
1AD	0.829	0.728	0.590	0.054	0.000	0.000	0.343	0.317	0.698	0.366	0.324	0.541
1AE	0.829	0.728	0.590	0.054	0.000	0.000	0.343	0.317	0.698	0.366	0.324	0.541
1AF	0.829	0.728	0.590	0.054	0.000	0.000	0.343	0.317	0.698	0.366	0.324	0.541
1AG	0.829	0.728	0.590	0.054	0.000	0.000	0.343	0.317	0.698	0.366	0.324	0.541
1AH	0.829	0.728	0.590	0.054	0.000	0.000	0.343	0.317	0.698	0.366	0.324	0.541
1BA	1.012	0.971	0.862	0.478	0.101	0.185	0.000	0.119	0.567	0.441	0.775	0.874
1BB	1.012	0.971	0.862	0.478	0.101	0.185	0.000	0.119	0.567	0.441	0.775	0.874
1BC	0.814	0.914	0.721	0.255	0.000	0.104	0.000	0.000	0.066	0.246	0.521	0.724
1BD	1.012	0.971	0.862	0.478	0.101	0.185	0.000	0.119	0.567	0.441	0.775	0.874
1BE	1.012	0.971	0.862	0.478	0.101	0.185	0.000	0.119	0.567	0.441	0.775	0.874
1BG	1.012	0.971	0.862	0.478	0.101	0.185	0.000	0.119	0.567	0.441	0.775	0.874
1BH	1.012	0.971	0.862	0.478	0.101	0.185	0.000	0.119	0.567	0.441	0.775	0.874
1CA	0.978	0.988	0.922	0.413	0.291	0.216	0.000	0.000	0.413	0.724	0.783	0.889
1CB	0.978	0.988	0.922	0.413	0.291	0.216	0.000	0.000	0.413	0.724	0.783	0.889
1CC	0.814	0.959	0.907	0.135	0.265	0.031	0.078	0.022	0.795	0.721	0.745	0.855
1CD	0.978	0.988	0.922	0.413	0.291	0.216	0.000	0.000	0.413	0.724	0.783	0.889
1CE	0.978	0.988	0.922	0.413	0.291	0.216	0.000	0.000	0.413	0.724	0.783	0.889
1DA	0.978	0.988	0.922	0.413	0.291	0.216	0.000	0.000	0.413	0.724	0.783	0.889
1DB	1.012	0.971	0.862	0.478	0.101	0.185	0.000	0.119	0.567	0.441	0.775	0.874
1DC	0.829	0.728	0.590	0.054	0.000	0.000	0.343	0.317	0.698	0.366	0.324	0.541
1DD	0.829	0.728	0.590	0.054	0.000	0.000	0.343	0.317	0.698	0.366	0.324	0.541
1EA	0.870	0.914	0.777	0.243	0.000	0.000	0.000	0.000	0.139	0.351	0.563	0.694
1EB	0.870	0.914	0.777	0.243	0.000	0.000	0.000	0.000	0.139	0.351	0.563	0.694
1EC	0.870	0.914	0.777	0.243	0.000	0.000	0.000	0.000	0.139	0.351	0.563	0.694
1ED	0.829	0.728	0.590	0.054	0.000	0.000	0.343	0.317	0.698	0.366	0.324	0.541
1EE	0.829	0.728	0.590	0.054	0.000	0.000	0.343	0.317	0.698	0.366	0.324	0.541
1EF	0.874	0.938	0.653	0.409	0.161	0.559	0.777	0.762	0.814	0.777	0.706	0.739
1EG	0.874	0.938	0.653	0.409	0.161	0.559	0.777	0.762	0.814	0.777	0.706	0.739
1FA	0.814	0.959	0.907	0.135	0.265	0.031	0.078	0.022	0.795	0.721	0.745	0.855
1FB	0.870	0.914	0.777	0.243	0.000	0.000	0.000	0.000	0.139	0.351	0.563	0.694
1FC	0.870	0.914	0.777	0.243	0.000	0.000	0.000	0.000	0.139	0.351	0.563	0.694
1FD	0.870	0.914	0.777	0.243	0.000	0.000	0.000	0.000	0.139	0.351	0.563	0.694
1FE	0.870	0.914	0.777	0.243	0.000	0.000	0.000	0.000	0.139	0.351	0.563	0.694
1FF	1.019	0.980	0.762	0.340	0.377	0.656	0.818	0.724	0.910	0.974	0.841	0.825
1FG	0.874	0.938	0.653	0.409	0.161	0.559	0.777	0.762	0.814	0.777	0.706	0.739
1GA	0.915	0.992	0.933	0.251	0.183	0.015	0.000	0.000	0.000	0.511	0.590	0.862
1GB	0.702	0.777	0.642	0.000	0.000	0.104	0.190	0.284	0.490	0.478	0.529	0.676
1GC	0.702	0.777	0.642	0.000	0.000	0.104	0.190	0.284	0.490	0.478	0.529	0.676
1GD	1.109	1.083	0.892	0.274	0.399	0.498	0.717	0.736	0.988	0.862	0.833	0.814
1GE	1.109	1.083	0.892	0.274	0.399	0.498	0.717	0.736	0.988	0.862	0.833	0.814
1GF	1.109	1.083	0.892	0.274	0.399	0.498	0.717	0.736	0.988	0.862	0.833	0.814
1GG	0.702	0.777	0.642	0.000	0.000	0.104	0.190	0.284	0.490	0.478	0.529	0.676
1HA	1.019	0.980	0.762	0.340	0.377	0.656	0.818	0.724	0.910	0.974	0.841	0.825
1HB	1.019	0.980	0.762	0.340	0.377	0.656	0.818	0.724	0.910	0.974	0.841	0.825
1HC	0.874	0.938	0.653	0.409	0.161	0.559	0.777	0.762	0.814	0.777	0.706	0.739
1HD	1.109	1.083	0.892	0.274	0.399	0.498	0.717	0.736	0.988	0.862	0.833	0.814
1HE	1.109	1.083	0.892	0.274	0.399	0.498	0.717	0.736	0.988	0.862	0.833	0.814
1HF	1.001	0.963	0.624	0.143	0.209	0.621	0.833	0.833	1.003	0.829	0.687	0.765
1HG	1.001	0.963	0.624	0.143	0.209	0.621	0.833	0.833	1.003	0.829	0.687	0.765
1JA	0.635	0.699	0.231	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.187
1JB	0.635	0.699	0.231	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.187
1JC	0.635	0.699	0.231	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.187
1JD	0.635	0.699	0.231	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.187
1JE	0.635	0.699	0.231	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.187
1JF	0.635	0.699	0.231	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.187
1JG	0.635	0.699	0.231	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.187
1KA	1.001	0.963	0.624	0.143	0.209	0.621	0.833	0.833	1.003	0.829	0.687	0.765
1KB	1.001	0.963	0.624	0.143	0.209	0.621	0.833	0.833	1.003	0.829	0.687	0.765
1KC	1.001	0.963	0.624	0.143	0.209	0.621	0.833	0.833	1.003	0.829	0.687	0.765
1LA	0.635	0.699	0.231	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.187
1LA	0.739	0.657	0.624	0.235	0.336	0.475	0.523	0.657	0.814	0.814	0.733	0.687
1LA	0.739	0.657	0.624	0.235	0.336	0.475	0.523	0.657	0.814	0.814	0.733	0.687
1LB	0.739	0.657	0.624	0.235	0.336	0.475	0.523	0.657	0.814	0.814	0.733	0.687
1LB	0.739	0.657	0.624	0.235	0.336	0.475	0.523	0.657	0.814	0.814	0.733	0.687

Table 5.5.2 Monthly Unit Irrigation Demand by Sub-basin (2/5)
Drainage Area 2

Unit: m3/sec

Basin	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2AA	1.303	1.393	1.284	0.922	1.135	1.181	1.176	1.210	1.373	1.254	1.215	1.232
2AB	1.303	1.393	1.284	0.922	1.135	1.181	1.176	1.210	1.373	1.254	1.215	1.232
2BA	0.799	0.984	0.844	0.255	0.429	0.644	0.403	0.325	0.498	0.586	0.756	0.922
2BB	0.799	0.984	0.844	0.255	0.429	0.644	0.403	0.325	0.498	0.586	0.756	0.922
2BC	0.799	0.984	0.844	0.255	0.429	0.644	0.403	0.325	0.498	0.586	0.756	0.922
2BD	1.161	1.182	1.034	0.876	0.918	0.903	0.915	0.956	1.115	1.105	1.042	1.060
2CA	1.165	1.162	1.116	0.980	1.206	1.119	1.109	1.142	1.285	1.269	1.119	1.169
2CB	1.049	1.062	0.993	0.752	0.624	0.714	0.396	0.650	0.914	0.937	0.880	0.956
2CC	1.049	1.062	0.993	0.752	0.624	0.714	0.396	0.650	0.914	0.937	0.880	0.956
2D	0.859	0.963	0.844	0.559	0.627	0.563	0.418	0.459	0.864	0.721	0.625	0.818
2EA	0.709	0.938	0.810	0.328	0.000	0.085	0.026	0.075	0.359	0.187	0.343	0.721
2EB	0.709	0.938	0.810	0.328	0.000	0.085	0.026	0.075	0.359	0.187	0.343	0.721
2EC	0.709	0.938	0.810	0.328	0.000	0.085	0.026	0.075	0.359	0.187	0.343	0.721
2ED	0.915	0.992	0.933	0.251	0.183	0.015	0.000	0.000	0.000	0.511	0.590	0.862
2EE	1.128	1.182	1.094	0.829	0.844	0.856	0.747	0.762	1.092	1.012	0.953	1.034
2EF	0.799	0.847	0.743	0.127	0.119	0.139	0.078	0.000	0.247	0.396	0.285	0.556
2EG	0.799	0.847	0.743	0.127	0.119	0.139	0.078	0.000	0.247	0.396	0.285	0.556
2EG	0.709	0.938	0.810	0.328	0.000	0.085	0.026	0.075	0.359	0.187	0.343	0.721
2EH	1.128	1.182	1.094	0.829	0.844	0.856	0.747	0.762	1.092	1.012	0.953	1.034
2EJ	1.128	1.182	1.094	0.829	0.844	0.856	0.747	0.762	1.092	1.012	0.953	1.034
2EK	1.128	1.182	1.094	0.829	0.844	0.856	0.747	0.762	1.092	1.012	0.953	1.034
2FA	0.691	0.959	0.750	0.359	0.325	0.436	0.437	0.362	0.671	0.597	0.417	0.698
2FB	0.691	0.959	0.750	0.359	0.325	0.436	0.437	0.362	0.671	0.597	0.417	0.698
2FC	0.691	0.959	0.750	0.359	0.325	0.436	0.437	0.362	0.671	0.597	0.417	0.698
2GA	0.889	0.893	0.765	0.413	0.433	0.486	0.661	0.627	0.795	0.739	0.640	0.777
2GB	0.691	0.959	0.750	0.359	0.325	0.436	0.437	0.362	0.671	0.597	0.417	0.698
2GC	0.889	0.893	0.765	0.413	0.433	0.486	0.661	0.627	0.795	0.739	0.640	0.777
2GD	0.889	0.893	0.765	0.413	0.433	0.486	0.661	0.627	0.795	0.739	0.640	0.777
2H	1.284	1.327	1.232	0.918	0.963	1.065	1.154	1.131	1.327	1.303	1.227	1.251
2J	1.135	1.219	1.008	0.841	0.993	0.965	0.978	0.945	1.188	1.146	1.088	1.146
2KA	0.739	0.657	0.624	0.235	0.336	0.475	0.523	0.657	0.814	0.814	0.733	0.687
2KB	1.284	1.327	1.232	0.918	0.963	1.065	1.154	1.131	1.327	1.303	1.227	1.251
2KC	1.284	1.327	1.232	0.918	0.963	1.065	1.154	1.131	1.327	1.303	1.227	1.251

Table 5.5.2 Monthly Unit Irrigation Demand by Sub-basin (3/5)
Drainage Area 3

Unit: m3/sec

Basin	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3AA	1.038	1.087	0.795	0.162	0.228	0.440	0.500	0.665	1.019	0.911	0.613	0.877
3AB	0.963	0.905	0.668	0.355	0.556	0.633	0.620	0.661	0.934	0.911	0.285	0.721
3AC	0.948	0.864	0.724	0.000	0.000	0.158	0.396	0.459	0.760	0.963	0.382	0.306
3BA	0.948	0.864	0.724	0.000	0.000	0.158	0.396	0.459	0.760	0.963	0.382	0.306
3BB	0.963	0.905	0.668	0.355	0.556	0.633	0.620	0.661	0.934	0.911	0.285	0.721
3BC	1.038	1.087	0.795	0.162	0.228	0.440	0.500	0.665	1.019	0.911	0.613	0.877
3BD	0.948	0.864	0.724	0.000	0.000	0.158	0.396	0.459	0.760	0.963	0.382	0.306
3CB	0.948	0.864	0.724	0.000	0.000	0.158	0.396	0.459	0.760	0.963	0.382	0.306
3DA	1.094	1.104	0.874	0.602	0.691	0.714	0.642	0.862	1.034	1.034	0.621	0.806
3DB	1.094	1.104	0.874	0.602	0.691	0.714	0.642	0.862	1.034	1.034	0.621	0.806
3EA	0.963	0.905	0.668	0.355	0.556	0.633	0.620	0.661	0.934	0.911	0.285	0.721
3EB	0.963	0.905	0.668	0.355	0.556	0.633	0.620	0.661	0.934	0.911	0.285	0.721
3EC	0.963	0.905	0.668	0.355	0.556	0.633	0.620	0.661	0.934	0.911	0.285	0.721
3ED	0.963	0.905	0.668	0.355	0.556	0.633	0.620	0.661	0.934	0.911	0.285	0.721
3FA	1.027	1.141	0.945	0.702	0.732	0.787	0.810	0.844	1.096	1.057	0.517	0.467
3FB	1.027	1.141	0.945	0.702	0.732	0.787	0.810	0.844	1.096	1.057	0.517	0.467
3G	0.594	0.401	0.175	0.255	0.433	0.575	0.459	0.568	0.772	0.956	0.289	0.250
3HA	0.896	1.149	0.963	0.779	0.795	0.899	0.892	0.889	1.026	1.038	0.876	0.586
3HB	0.896	1.149	0.963	0.779	0.795	0.899	0.892	0.889	1.026	1.038	0.876	0.586
3HC	1.116	1.186	1.049	0.799	0.680	0.772	0.904	0.989	1.069	1.023	0.941	0.676
3HD1	1.202	1.207	1.131	0.768	0.022	0.166	0.463	0.680	1.111	1.079	1.119	1.157
3HD2	1.202	1.207	1.131	0.768	0.022	0.166	0.463	0.680	1.111	1.079	1.119	1.157
3HD3	1.202	1.207	1.131	0.768	0.022	0.166	0.463	0.680	1.111	1.079	1.119	1.157
3J	0.960	1.071	0.713	0.440	0.504	0.748	0.754	0.840	1.034	1.042	0.849	0.754
3K	1.172	1.248	1.139	0.629	0.261	0.444	0.545	0.788	0.949	0.963	0.995	0.844
3L	0.896	1.149	0.963	0.779	0.795	0.899	0.892	0.889	1.026	1.038	0.876	0.586
3MA	1.146	1.137	1.030	0.826	0.762	0.899	0.862	0.900	1.019	1.038	0.907	0.982
3MB	1.146	1.137	1.030	0.826	0.762	0.899	0.862	0.900	1.019	1.038	0.907	0.982
3MC	1.146	1.137	1.030	0.826	0.762	0.899	0.862	0.900	1.019	1.038	0.907	0.982
3MD	1.172	1.248	1.139	0.629	0.261	0.444	0.545	0.788	0.949	0.963	0.995	0.844
3N	0.594	0.401	0.175	0.255	0.433	0.575	0.459	0.568	0.772	0.956	0.289	0.250

Table 5.5.2 Monthly Unit Irrigation Demand by Sub-basin (4/5)

Drainage Area 4

Unit: m3/sec

Basin	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4AA	0.698	0.649	0.515	0.505	0.788	0.687	0.777	0.672	0.953	0.601	0.351	0.497
4AB	0.698	0.649	0.515	0.505	0.788	0.687	0.777	0.672	0.953	0.601	0.351	0.497
4AC	1.038	0.947	0.691	0.243	0.000	0.340	0.246	0.616	0.829	0.836	0.413	0.519
4AD	1.038	0.947	0.691	0.243	0.000	0.340	0.246	0.616	0.829	0.836	0.413	0.519
4BA	1.038	0.947	0.691	0.243	0.000	0.340	0.246	0.616	0.829	0.836	0.413	0.519
4BB	1.038	0.947	0.691	0.243	0.000	0.340	0.246	0.616	0.829	0.836	0.413	0.519
4BC	1.045	1.137	0.851	0.343	0.343	0.590	0.612	0.836	1.019	0.877	0.424	0.739
4BD	1.038	0.947	0.691	0.243	0.000	0.340	0.246	0.616	0.829	0.836	0.413	0.519
4BE	0.414	0.529	0.269	0.000	0.000	0.000	0.000	0.000	0.096	0.086	0.000	0.101
4BF	1.057	1.157	0.777	0.154	0.426	0.509	0.497	0.564	0.934	0.848	0.448	0.691
4BG	1.045	1.137	0.851	0.343	0.343	0.590	0.612	0.836	1.019	0.877	0.424	0.739
4CA	0.414	0.529	0.269	0.000	0.000	0.000	0.000	0.000	0.096	0.086	0.000	0.101
4CB	0.414	0.529	0.269	0.000	0.000	0.000	0.000	0.000	0.096	0.086	0.000	0.101
4CC	1.057	1.157	0.777	0.154	0.426	0.509	0.497	0.564	0.934	0.848	0.448	0.691
4DA	1.045	1.137	0.851	0.343	0.343	0.590	0.612	0.836	1.019	0.877	0.424	0.739
4DB	1.045	1.137	0.851	0.343	0.343	0.590	0.612	0.836	1.019	0.877	0.424	0.739
4DC	1.045	1.137	0.851	0.343	0.343	0.590	0.612	0.836	1.019	0.877	0.424	0.739
4DD	0.986	0.934	0.724	0.274	0.571	0.498	0.683	0.609	0.945	0.780	0.282	0.504
4DE	1.094	1.104	0.874	0.602	0.691	0.714	0.642	0.862	1.034	1.034	0.621	0.806
4EA	0.362	0.773	0.717	0.000	0.052	0.490	0.582	0.855	0.868	0.493	0.000	0.000
4EB	0.362	0.773	0.717	0.000	0.052	0.490	0.582	0.855	0.868	0.493	0.000	0.000
4EC	0.986	0.934	0.724	0.274	0.571	0.498	0.683	0.609	0.945	0.780	0.282	0.504
4ED	1.060	1.141	0.952	0.532	0.851	0.810	0.765	1.001	1.073	1.049	0.324	0.594
4FA	0.362	0.773	0.717	0.000	0.052	0.490	0.582	0.855	0.868	0.493	0.000	0.000
4FB	0.362	0.773	0.717	0.000	0.052	0.490	0.582	0.855	0.868	0.493	0.000	0.000
4GA	0.362	0.773	0.717	0.000	0.052	0.490	0.582	0.855	0.868	0.493	0.000	0.000
4GB	1.068	1.071	1.038	0.965	1.038	0.907	0.978	0.982	1.076	1.090	0.814	0.844
4GC	1.068	1.071	1.038	0.965	1.038	0.907	0.978	0.982	1.076	1.090	0.814	0.844
4GD	1.068	1.071	1.038	0.965	1.038	0.907	0.978	0.982	1.076	1.090	0.814	0.844
4GE	1.165	1.174	1.042	0.965	1.001	0.918	0.978	1.064	1.142	1.049	0.849	0.974
4GF	1.165	1.174	1.042	0.965	1.001	0.918	0.978	1.064	1.142	1.049	0.849	0.974
4GG	1.116	1.170	1.195	0.868	0.732	0.683	0.877	0.986	1.123	1.120	0.868	1.120
4HA	0.967	1.170	0.840	0.316	0.709	0.853	0.851	0.937	1.100	1.094	0.093	0.295
4HB	1.116	1.170	1.195	0.868	0.732	0.683	0.877	0.986	1.123	1.120	0.868	1.120
4JA	1.068	1.071	1.038	0.965	1.038	0.907	0.978	0.982	1.076	1.090	0.814	0.844
4JB	1.273	1.211	1.180	0.745	0.149	0.266	0.571	0.881	1.103	1.187	1.204	1.146
4KA	1.068	1.071	1.038	0.965	1.038	0.907	0.978	0.982	1.076	1.090	0.814	0.844
4KB	1.273	1.211	1.180	0.745	0.149	0.266	0.571	0.881	1.103	1.187	1.204	1.146

Table 5.5.2 Monthly Unit Irrigation Demand by Sub-basin (5/5)

Drainage Area 5

Unit: m3/sec

Basin	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
5AA	0.653	0.790	0.780	0.309	0.246	0.174	0.026	0.000	0.405	0.429	0.355	0.538
5AB	0.653	0.790	0.780	0.309	0.246	0.174	0.026	0.000	0.405	0.429	0.355	0.538
5AC	0.930	1.004	0.971	0.640	0.650	0.598	0.582	0.609	0.934	0.889	0.764	0.829
5AD	0.930	1.004	0.971	0.640	0.650	0.598	0.582	0.609	0.934	0.889	0.764	0.829
5BA	0.698	0.649	0.515	0.505	0.788	0.687	0.777	0.672	0.953	0.601	0.351	0.497
5BB	0.698	0.649	0.515	0.505	0.788	0.687	0.777	0.672	0.953	0.601	0.351	0.497
5BC	0.698	0.649	0.515	0.505	0.788	0.687	0.777	0.672	0.953	0.601	0.351	0.497
5BD	0.698	0.649	0.515	0.505	0.788	0.687	0.777	0.672	0.953	0.601	0.351	0.497
5BE	0.862	0.893	0.706	0.274	0.317	0.498	0.590	0.590	0.702	0.553	0.386	0.560
5CA	0.859	0.963	0.844	0.559	0.627	0.563	0.418	0.459	0.864	0.721	0.625	0.818
5CB	0.859	0.963	0.844	0.559	0.627	0.563	0.418	0.459	0.864	0.721	0.625	0.818
5CC	0.859	0.963	0.844	0.559	0.627	0.563	0.418	0.459	0.864	0.721	0.625	0.818
5DA	1.139	1.219	1.019	0.741	1.150	1.169	1.198	1.299	1.385	1.101	0.583	0.896
5DB	0.862	0.893	0.706	0.274	0.317	0.498	0.590	0.590	0.702	0.553	0.386	0.560
5DC	0.930	1.004	0.971	0.640	0.650	0.598	0.582	0.609	0.934	0.889	0.764	0.829
5DD	1.030	1.157	1.094	0.845	0.963	1.061	1.079	1.146	1.258	1.090	0.802	0.926
5EA	1.217	1.248	1.142	0.860	0.982	1.015	1.012	1.034	1.134	1.004	0.941	1.053
5EB	1.299	1.414	1.325	1.130	1.538	1.389	1.374	1.437	1.512	1.396	0.995	1.083
5EC	0.945	1.009	0.799	0.131	0.489	0.756	0.795	0.836	0.972	0.724	0.428	0.556
5FA	1.299	1.414	1.325	1.130	1.538	1.389	1.374	1.437	1.512	1.396	0.995	1.083
5FB	1.30	1.41	1.33	1.13	1.54	1.39	1.37	1.44	1.51	1.40	1.00	1.08
5G	1.22	1.25	1.14	0.86	0.98	1.01	1.01	1.03	1.13	1.00	0.94	1.05
5H	1.21	1.27	1.24	0.85	1.06	1.15	1.12	1.18	1.26	0.95	0.99	1.14
5J	0.94	1.01	0.80	0.13	0.49	0.76	0.80	0.84	0.97	0.72	0.43	0.56

Table 5.5.3 Irrigation Potential by Sub-basin (1/4) (for paddy)
(in case of monthly mean flow)

Basin	Area(ha)	Basin	Area(ha)	Basin	Area(ha)	Basin	Area(ha)	Basin	Area(ha)	Basin	Area(ha)
1AA	856	1GA	264	2BA	0	3AA11	0	4AA	0	5AA1	0
1AB	1013	1GB	3161	2BB	8660	3AA12	0	4AB	0	5AA2	0
1AC	329	1GC1	89	2BC	8792	3AA13	0	4AC	0	5AA3	0
1AD	817	1GC2	1056	2BD	4813	3AA2	0	4AD	0	5AA4	0
1AE	343	1GD1	1241	2CB1	338	3AB	0	4BA	212	5AB	0
1AF	934	1GD2	4006	2CB2	828	3AC1	0	4BB	43	5AC	0
1AG	797	1GD3	2060	2CB3	11895	3AC2	0	4BC	2310	5AD	0
1AH	1215	1GE	2583	2CC1	1823	3BA1	0	4BD	2457	5BA	0
1BA	0	1GF	982	2CC2	160	3BA2	0	4BE	9761	5BB	0
1BB1	0	1GG	0	2CC3	694	3BB	0	4BF	3412	5BC	0
1BB2	0	1HA	5212	2CC4	1161	3BC	0	4BG	19479	5BD	0
1BC	0	1HB	3688	2CC5	1990	3BD	0	4CA	0	5BE	0
1BD	0	1HC	3133	2EA	0	3CB	0	4CB1	0	5DA1	582
1BE	0	1HD	2299	2EB1	0	3DA	4536	4CB2	0	5DA2	279
1BG	0	1HE	1929	2EB2	0	3DB	251	4CC	13089	5DA3	402
1BH	0	1HF	2325	2EB3	0	3EA1	40	4DA1	668	5DB	713
1CA	0	1HG	944	2EC	0	3EA21	30	4DA2	2094	5DC1	0
1CB1	0	1JA	0	2ED1	0	3EA22	1	4DB	1689	5DC2	0
1CB2	0	1JB	0	2ED2	0	3EB1	21	4DC	1126	5DD	12667
1CC	0	1JC1	0	2EI1	40	3EB2	347	4DD	1750		
1CD	0	1JC2	0	2EI2	0	3EC	182	4DE	2592		
1CE	0	1JC3	0	2EI3	54	3ED1	10	4EA1	1992		
1DA	6875	1JD	0	2EF	586	3ED2	85	4EA2	335		
1DB	1994	1JE	0	2EG1	0	3FA1	903	4EB	4032		
1DC	1779	1JF1	0	2EG21	21	3FA2	365	4EC	1841		
1DD	1712	1JF2	0	2EG22	39	3FA3	102	4ED1	430		
1EA	37	1JG1	987	2EH1	0	3FB	575	4ED2	888		
1EB	10625	1JG2	763	2EH2	0	3G1	1297	4ED3	6583		
1EC	2758	1KA	1049	2EJ	2337	3G2	3704	4ED4	782		
1ED	2045	1KB1	373	2EK	0	3G3	680	4FA1	6850		
1EE	8861	1KB2	2316	2FA	0	3G4	62	4FA2	5291		
1EF	4250	1KB3	8064	2FC	0	3HA	783	4FB	2186		
1EG	5829	1KB4	2557	2GA	0	3HB	780	4GA	2174		
1FA	0	1KB5	8509	2GB1	0	3HC	823	4GB	2204		
1FB	0	1KC1	1777	2GB2	0	3HD1	195	4GC	728		
1FC	0	1KC2	2198	2GB3	0	3LA1	186	4GD	2961		
1FD1	0	1KC3	180	2GC	0	3LA2	854	4GE	4409		
1FD2	0	1LA1	0	2GD	0	3LA3	874	4GF	5345		
1FE	704	1LA2	0	2KA1	0	3LA4	619	4GG	1907		
1FF	221	1LA31	0	2KA2	0	3LB	207	4HA1	245		
1FG	18885	1LA32	0	2KA3	0	3MA	1512	4HA21	0		
		1LB11	0	2KA4	0	3MB1	189	4HA22	0		
		1LB12	0	2KA5	0	3MB2	664	4HA23	9		
		1LB2	0	2KA6	0	3MB3	63	4HA24	127		
				2KB1	612	3MB4	148	4HA3	237		
				2KB2	1122	3MC1	537	4HA4	136		
				2KC	1930	3MC2	116	4HA5	719		
						3MD1	50	4HB	2382		
						3MD2	88	4HC	1862		
Total	72,879	Total	63,745	Total	47,895	Total	21,879	Total	117,337	Total	14,643

Table 5.5.3 Irrigation Potential by Sub-basin (2/4) (for upland crop)
(in case of monthly mean flow)

Basin	Area(ha)	Basin	Area(ha)	Basin	Area(ha)	Basin	Area(ha)	Basin	Area(ha)	Basin	Area(ha)						
1AA	856	1GA	1659	2BA	3252	3AA11	9	4AA	1353	5AA1	51						
1AB	1013	1GB	2008	2BB	5408	3AA12	69	4AB	1595	5AA2	13						
1AC	329	1GC1	267	2BC	8792	3AA13	20	4AC	3955	5AA3	205						
1AD	817	1GC2	3151	2BD	4813	3AA2	0	4AD	3855	5AA4	243						
1AE	343	1GD1	229	2CB1	338	3AB	375	4BA	2655	5AB	205						
1AF	934	1GD2	1753	2CB2	828	3AC1	0	4BB	2271	5AC	370						
1AG	797	1GD3	1818	2CB3	11895	3AC2	651	4BC	1538	5AD	175						
1AH	1215	1GE	2583	2CC1	1823	3BA1	161	4BD	5968	5BA	482						
1BA	1155	1GF	982	2CC2	160	3BA2	1522	4BE	11894	5BB	819						
1BB1	69	1GG	1210	2CC3	694	3BB	324	4BF	3412	5BC	3684						
1BB2	3499	1HA	5212	2CC4	1161	3BC	998	4BG	4258	5BD	1231						
1BC	5098	1HB	3688	2CC5	1990	3BD	363	4CA	7711	5BE	2326						
1BD	1715	1HC	3133	2EA	1076	3CB	467	4CB1	2116	5DA1	582						
1BE	1670	1HD	2299	2EB1	1129	3DA	213	4CB2	3610	5DA2	279						
1BG	985	1HE	1929	2EB2	437	3DB	222	4CC	6946	5DA3	402						
1BH	1391	1HF	2325	2EB3	330	3EA1	128	4DA1	668	5DB	713						
1CA	1184	1HG	944	2EC	1720	3EA21	96	4DA2	2094	5DC1	499						
1CB1	384	1JA	4260	2ED1	151	3EA22	0	4DB	1689	5DC2	1470						
1CB2	152	1JB	2576	2ED2	874	3EB1	21	4DC	1126	5DD	2264						
1CC	1772	1JC1	357	2EE1	356	3EB2	194	4DD	1750								
1CD	1417	1JC2	745	2EE2	0	3EC	182	4DE	2593								
1CE	426	1JC3	1617	2EE3	1020	3ED1	10	4EA1	1992								
1DA	2084	1JD	1719	2EF	1013	3ED2	85	4EA2	335								
1DB	1994	1JE	3163	2EG1	926	3FA1	903	4EB	4032								
1DC	1779	1JF1	2519	2EG21	1199	3FA2	365	4EC	1841								
1DD	1712	1JF2	2305	2EG22	2121	3FA3	292	4ED1	429								
1EA	5575	1JG1	1418	2EH1	59	3FB	753	4ED2	889								
1EB	5087	1JG2	1088	2EH2	1138	3G1	1297	4ED3	6583								
1EC	2758	1KA	1049	2EJ	1461	3G2	3704	4ED4	782								
1ED	2045	1KB1	373	2EK	1441	3G3	680	4FA1	6849								
1EE	6469	1KB2	2316	2FA	1097	3G4	62	4FA2	5291								
1EF	4146	1KB3	8064	2FC	2520	3HA	352	4FB	2187								
1EG	5829	1KB4	2557	2GA	697	3HB	780	4GA	2173								
1FA	886	1KB5	8509	2GB1	649	3HC	823	4GB	2204								
1FB	2124	1KC1	1777	2GB2	156	3HD1	195	4GC	729								
1FC	1532	1KC2	2198	2GB3	756	3LA1	186	4GD	2961								
1FD1	1444	1KC3	180	2GC	351	3LA2	854	4GE	4409								
1FD2	109	1LA1	4430	2GD	2622	3LA3	874	4GF	5673								
1FE	4917	1LA2	4794	2KA1	2199	3LA4	619	4GG	4592								
1FF	1746	1LA31	12187	2KA2	688	3LB	207	4HA1	245								
1FG	7257	1LA32	10270	2KA3	1265	3MA	1512	4HA21	0								
		1LB11	2597	2KA4	4275	3MB1	189	4HA22	0								
		1LB12	5343	2KA5	935	3MB2	664	4HA23	9								
		1LB2	3857	2KA6	7272	3MB3	63	4HA24	127								
				2KB1	453	3MB4	148	4HA3	237								
				2KB2	261	3MC1	537	4HA4	136								
				2KC	499	3MC2	116	4HA5	719								
						3MD1	50	4HB	2382								
						3MD2	88	4HC	1862								
Total		86,714	Total		127,458	Total		84,300	Total		22,423	Total		132,725	Total		16,013

Table 5.5.3 Irrigation Potential by Sub-basin (3/4) (for paddy)
(in case of 80% dependable monthly flow)

Basin	Area(ha)	Basin	Area(ha)	Basin	Area(ha)	Basin	Area(ha)	Basin	Area(ha)	Basin	Area(ha)
1AA	627	1GA	264	2BA	0	3AA11	0	4AA	0	5AA1	0
1AB	748	1GB	2309	2BB	6830	3AA12	0	4AB	0	5AA2	0
1AC	301	1GC1	89	2BC	7013	3AA13	0	4AC	0	5AA3	0
1AD	567	1GC2	1056	2BD	3807	3AA2	0	4AD	0	5AA4	0
1AE	357	1GD1	1241	2CB1	254	3AB	0	4BA	212	5AB	0
1AF	907	1GD2	1912	2CB2	611	3AC1	0	4BB	43	5AC	0
1AG	783	1GD3	1216	2CB3	5013	3AC2	0	4BC	2310	5AD	0
1AH	874	1GE	1969	2CC1	786	3BA1	0	4BD	2457	5BA	0
1BA	0	1GF	748	2CC2	118	3BA2	0	4BE	9761	5BB	0
1BB1	0	1GG	0	2CC3	524	3BB	0	4BF	2237	5BC	0
1BB2	0	1HA	4527	2CC4	925	3BC	0	4BG	13436	5BD	0
1BC	0	1HB	3590	2CC5	1576	3BD	0	4CA	0	5BE	0
1BD	0	1HC	2856	2EA	0	3CB	0	4CB1	0	5DA1	295
1BE	0	1HD	1615	2EB1	0	3DA	6170	4CB2	0	5DA2	139
1BG	0	1HE	1809	2EB2	0	3DB	155	4CC	5806	5DA3	205
1BH	0	1HF	1868	2EB3	0	3EA1	40	4DA1	1126	5DB	394
1CA	0	1HG	830	2EC	0	3EA21	30	4DA2	1142	5DC1	0
1CB1	0	1JA	0	2ED1	0	3EA22	1	4DB	2832	5DC2	0
1CB2	0	1JB	0	2ED2	0	3EB1	10	4DC	2084	5DD	7423
1CC	0	1JC1	0	2EE1	40	3EB2	1236	4DD	2079		
1CD	0	1JC2	0	2EE2	0	3EC	128	4DE	1603		
1CE	0	1JC3	0	2EE3	54	3ED1	10	4EA1	1105		
1DA	6875	1JD	0	2EF	463	3ED2	53	4EA2	196		
1DB	1750	1JE	0	2EG1	0	3FA1	730	4EB	2327		
1DC	1407	1JF1	0	2EG21	21	3FA2	292	4EC	1217		
1DD	1525	1JF2	0	2EG22	39	3FA3	84	4ED1	215		
1EA	37	1JG1	987	2EH1	0	3FB	456	4ED2	450		
1EB	8938	1JG2	763	2EH2	0	3G1	941	4ED3	3339		
1EC	2462	1KA	1209	2EJ	1355	3G2	3160	4ED4	285		
1ED	1882	1KB1	311	2EK	0	3G3	544	4FA1	4299		
1EE	7117	1KB2	1879	2FA	0	3G4	52	4FA2	2277		
1EF	3794	1KB3	6525	2FC	0	3HA	785	4FB	1733		
1EG	5360	1KB4	2047	2GA	0	3HB	905	4GA	1721		
1FA	0	1KB5	6748	2GB1	0	3HC	973	4GB	1746		
1FB	0	1KC1	1273	2GB2	0	3HD1	149	4GC	580		
1FC	0	1KC2	1573	2GB3	0	3LA1	392	4GD	2344		
1FD1	0	1KC3	132	2GC	0	3LA2	724	4GE	3489		
1FD2	0	1LA1	0	2GD	0	3LA3	386	4GF	4489		
1FE	704	1LA2	0	2KA1	0	3LA4	265	4GG	1519		
1FF	221	1LA31	0	2KA2	0	3LB	261	4HA1	209		
1FG	16135	1LA32	0	2KA3	0	3MA	105	4HA21	0		
		1LB11	0	2KA4	0	3MB1	87	4HA22	0		
		1LB12	0	2KA5	0	3MB2	253	4HA23	9		
		1LB2	0	2KA6	0	3MB3	63	4HA24	100		
				2KB1	612	3MB4	63	4HA3	191		
				2KB2	1122	3MC1	231	4HA4	127		
				2KC	1930	3MC2	53	4HA5	564		
						3MD1	484	4HB	1883		
						3MD2	63	4HC	1478		
Total		63,371		Total		51,346		Total		33,093	
Total		63,371		Total		20,334		Total		85,020	
Total		63,371		Total		8,456		Total		8,456	

Table 5.5.3 Irrigation Potential by Sub-basin (4/4) (for upland crop)
(in case of 80% dependable monthly flow)

Basin	Area(ha)	Basin	Area(ha)	Basin	Area(ha)	Basin	Area(ha)	Basin	Area(ha)	Basin	Area(ha)						
1AA	627	1GA	1042	2BA	2470	3AA11	9	4AA	933	5AA1	12						
1AB	748	1GB	1531	2BB	4360	3AA12	40	4AB	1017	5AA2	0						
1AC	301	1GC1	157	2BC	7013	3AA13	9	4AC	2979	5AA3	64						
1AD	567	1GC2	1922	2BD	3807	3AA2	39	4AD	3063	5AA4	77						
1AE	357	1GD1	257	2CB1	254	3AB	236	4BA	1796	5AB	90						
1AF	907	1GD2	1083	2CB2	611	3AC1	20	4BB	1500	5AC	185						
1AG	783	1GD3	1217	2CB3	5013	3AC2	428	4BC	1017	5AD	62						
1AH	874	1GE	1969	2CC1	786	3BA1	90	4BD	7437	5BA	241						
1BA	766	1GF	748	2CC2	118	3BA2	1890	4BE	8163	5BB	797						
1BB1	59	1GG	968	2CC3	524	3BB	504	4BF	2237	5BC	2408						
1BB2	3054	1HA	4527	2CC4	925	3BC	638	4BG	2648	5BD	692						
1BC	4165	1HB	3590	2CC5	1576	3BD	425	4CA	396	5BE	1496						
1BD	1446	1HC	2856	2EA	447	3CB	2460	4CB1	1171	5DA1	295						
1BE	1386	1HD	1615	2EB1	447	3DA	174	4CB2	1739	5DA2	140						
1BG	1171	1HE	1809	2EB2	171	3DB	146	4CC	4294	5DA3	205						
1BH	1101	1HF	1868	2EB3	139	3EA1	118	4DA1	1126	5DB	393						
1CA	971	1HG	830	2EC	969	3EA21	1017	4DA2	1142	5DC1	281						
1CB1	597	1JA	3091	2ED1	60	3EA22	0	4DB	2832	5DC2	717						
1CB2	597	1JB	2262	2ED2	349	3EB1	10	4DC	2084	5DD	1184						
1CC	1418	1JC1	243	2EE1	147	3EB2	172	4DD	2079								
1CD	1154	1JC2	759	2EE2	0	3EC	128	4DE	1605								
1CE	345	1JC3	1445	2EE3	425	3ED1	10	4EA1	1105								
1DA	1752	1JD	1547	2EF	463	3ED2	53	4EA2	196								
1DB	1750	1JE	2405	2EG1	475	3FA1	730	4EB	2327								
1DC	1407	1JF1	2318	2EG21	530	3FA2	292	4EC	1217								
1DD	1525	1JF2	2062	2EG22	928	3FA3	242	4ED1	215								
1EA	4674	1JG1	1274	2EH1	25	3FB	615	4ED2	449								
1EB	4301	1JG2	974	2EH2	462	3G1	941	4ED3	3340								
1EC	2462	1KA	1209	2EJ	1355	3G2	3160	4ED4	285								
1ED	1882	1KB1	311	2EK	570	3G3	544	4FA1	4298								
1EB	5759	1KB2	1879	2FA	630	3G4	52	4FA2	2277								
1EF	3794	1KB3	6525	2FC	1585	3HA	329	4FB	1734								
1EG	5360	1KB4	2047	2GA	326	3HB	905	4GA	1720								
1FA	722	1KB5	6748	2GB1	448	3HC	973	4GB	1747								
1FB	1762	1KC1	1273	2GB2	112	3HD1	148	4GC	579								
1FC	1270	1KC2	1573	2GB3	553	3LA1	392	4GD	2344								
1FD1	1127	1KC3	132	2GC	351	3LA2	724	4GE	3489								
1FD2	87	1LA1	3416	2GD	1282	3LA3	386	4GF	4489								
1FE	4402	1LA2	3868	2KA1	1314	3LA4	265	4GG	1543								
1FF	1373	1LA31	9877	2KA2	479	3LB	261	4HA1	209								
1FG	6495	1LA32	8277	2KA3	873	3MA	105	4HA21	0								
		1LB11	2150	2KA4	1521	3MB1	87	4HA22	0								
		1LB12	4437	2KA5	494	3MB2	253	4HA23	9								
		1LB2	3083	2KA6	5644	3MB3	63	4HA24	100								
				2KB1	350	3MB4	63	4HA3	191								
				2KB2	215	3MC1	231	4HA4	127								
				2KC	399	3MC2	53	4HA5	564								
						3MD1	484	4HB	1883								
						3MD2	63	4HC	1478								
Total		75,298	Total		103,174	Total		51,995	Total		20,977	Total		89,173	Total		9,339

Table 5.5.4 Groundwater Availability for Irrigation

Basin	Q	Area	Unit Q	Basin	Q	Area	Unit Q	Basin	Q	Area	Unit Q	Basin	Q	Area	Unit Q	Basin	Q	Area	Unit Q
	m3/Day	km2	l/km2		m3/Day	km2	l/km2		m3/Day	km2	l/km2		m3/Day	km2	l/km2		m3/Day	km2	l/km2
1AA	464	246	0.0218	2AA	18488	11498	0.0186	3AA	283	697	0.0047	4A A	217	519	0.0048	5AA	1320	1247	0.0123
1AB	394	293	0.0156	2AB	25336	9853	0.0298	3AB	2468	1786	0.016	4AB	451	684	0.0076	5AB	455	482	0.0109
1AC	389	120	0.0375	2BA	2859	1325	0.025	3AC	848	887	0.0111	4AC	185	429	0.0005	5AC	1745	1085	0.0186
1AD	666	222	0.0347	2BB	6608	2038	0.0375	3BA	412	830	0.0057	4AD	311	441	0.0082	5AD	908	517	0.0203
1AE	554	176	0.0364	2BC	11561	3827	0.035	3BB	131	256	0.0059	4BA	406	317	0.0148	5BA	125	269	0.0054
1AF	1326	411	0.0373	2BD	45466	13251	0.0397	3BC	464	476	0.0113	4BB	144	259	0.0064	5BB	461	452	0.0118
1AG	1190	359	0.0384	2CA	20900	3571	0.0677	3BD	315	328	0.0111	4BC	204	227	0.0104	5BC	2824	1636	0.02
1AH	2068	564	0.0424	2CB	4897	2380	0.0238	3CB	405	395	0.0119	4BD	1431	547	0.0303	5BD	805	674	0.0138
1BA	1373	628	0.0253	2CC	35730	11436	0.0362	3DA	2039	807	0.0292	4BE	502	554	0.0105	5BE	2636	1238	0.0246
1BB	2695	865	0.0361	2D	22136	12965	0.0198	3DB	2304	822	0.0324	4BF	514	374	0.0159	5CA	3417	2342	0.0169
1BC	2595	770	0.039	2EA	298	412	0.0084	3EA	2608	875	0.0345	4BG	1225	443	0.032	5CB	7145	2259	0.0366
1BD	1011	678	0.0173	2EB	507	726	0.0081	3EB	2695	804	0.0388	4CA	559	537	0.012	5CC	9443	3005	0.0364
1BE	2527	1011	0.0289	2EC	677	826	0.0095	3EC	2410	671	0.0416	4CB	366	313	0.0135	5DA	8306	2237	0.043
1BG	1952	907	0.0249	2ED	386	421	0.0106	3ED	1893	570	0.0384	4CC	2242	1019	0.0255	5DB	3579	1286	0.0322
1BH	1909	618	0.0358	2EE	846	609	0.0161	3FA	32475	9995	0.0376	4CD	670	715	0.0108	5DC	2894	1268	0.0264
1CA	780	684	0.0132	2EF	591	389	0.0176	3FB	12383	4196	0.0342	4DB	601	453	0.0154	5DD	5554	1883	0.0341
1CB	688	671	0.0119	2EG1	389	397	0.0113	3G	18131	6306	0.0333	4DC	412	354	0.0135	5EA	80878	25393	0.0369
1CC	420	664	0.0073	2EG2	2007	1264	0.0184	3HA	4353	921	0.0547	4DD	1027	452	0.0263	5EB	130746	27092	0.0559
1CD	1054	521	0.0234	2EH	1089	604	0.0209	3HB	11258	2498	0.0522	4DE	3054	735	0.0481	5EC	73003	29264	0.0289
1CE	586	231	0.0294	2EJ	2860	1419	0.0233	3HC	11408	2942	0.0449	4EA	1488	743	0.0232	5ED	59376	17936	0.0383
1DA	1752	520	0.039	2EK	759	603	0.0146	3HD1	2701	627	0.0499	4EB	2832	1193	0.0275	5FA	76655	18485	0.048
1DB	1712	696	0.0285	2FA	868	548	0.0183	3HD2	2472	386	0.0741	4EC	1496	605	0.0286	5FB	29256	8171	0.0414
1DC	1096	373	0.034	2FB	56	143	0.0045	3I	11741	3022	0.045	4ED	11360	3160	0.0416	5GA	103438	22579	0.053
1DD	1081	355	0.0352	2FC	1510	1514	0.0115	3K	23580	4176	0.0654	4FA	4141	2181	0.022	5GB	9726	3379	0.0333
1EA	885	429	0.0239	2GA	700	323	0.0251	3LA	26293	7305	0.0417	4FB	10677	3950	0.0313	5H	15894	6784	0.0271
1EB	1173	380	0.0357	2GB	1086	963	0.0131	3LB	2626	771	0.0394	4GA	14046	3909	0.0416	5J	55378	29263	0.0219
1EC	787	250	0.0364	2GC	848	753	0.013	3MA	19371	6120	0.0366	4GB	18192	5503	0.0383				
1ED	415	128	0.0375	2GD	2402	1153	0.0241	3MB	6041	1700	0.0411	4GC	5848	1823	0.0371				
1EE	1437	401	0.0415	2H	12009	8215	0.0169	3MC	3739	1044	0.0415	4GD	24438	7399	0.0382				
1EF	1069	385	0.0321	2J	80187	28304	0.0328	3MD1	4854	1276	0.044	4GE	41209	11732	0.0407				
1EG	1887	544	0.0401	2KA	6572	5092	0.0149	3MD2	599	173	0.0401	4GF	51582	15518	0.0385				
1FA	172	240	0.0083	2KB	1841	1636	0.013	3N	11679	3175	0.0426	4GG	31205	7120	0.0507				
1FB	1337	378	0.0409	2KC	4433	1994	0.0257					4HA	18716	5480	0.0395				
1FC	1242	272	0.0528									4HB	43453	9066	0.0555				
1FD	660	480	0.0159									4HC	33771	6623	0.059				
1FE	2432	652	0.0432									4JA	28455	8489	0.0388				
1FF	819	272	0.0348									4JB	14214	3691	0.0446				
1FG	3467	980	0.0409									4KA	25516	8251	0.0358				
1GA	250	443	0.0065									4KB	33520	10218	0.038				
1GB	1370	518	0.0306																
1GC	715	912	0.0091																
1GD	2590	720	0.0416																
1GE	1228	391	0.0364																
1GF	1030	260	0.0459																
1GG	247	374	0.0076																
1HA	4890	869	0.0651																
1HB	2555	762	0.0388																
1HC	1462	521	0.0325																
1HD	2816	778	0.0419																
1HE	2507	761	0.0381																
1HF	2641	846	0.0361																
1HG	798	333	0.0277																
1JA	214	748	0.0033																
1JB	192	262	0.0085																
1JC	259	339	0.0088																
1JD	485	213	0.0264																
1JE	1266	601	0.0244																
1JF	1687	1006	0.0194																
1JG	1143	312	0.0424																
1KA	1453	463	0.0363																
1KB	13631	3558	0.0443																
1KC	9248	2898	0.0369																
1LA1	1029	914	0.013																
1LA2	2364	1003	0.0273																
1LA3	7095	2886	0.0285																
1LB1	2092	1449	0.0167																
1LB2	6349	2715	0.0271																
Total	121670			Total	316902			Total	224979			Total	430680			Total	685967		

Table 5.11.1 Generalized Effluent Quality Standards

Parameter	Maximum permitted in effluent discharge
BOD5 (20oC)	20 mg/l
Suspended solids	30 mg/l
Cyanide (as HCN)	0.1 mg/l
Sulphide (as S')	0.1 mg/l
Oil and grease	nil
Phenols	0.5 mg/l
Total toxic metals (alone or in combination)	0.5 mg/l
pH	6.5-9.0
Temperature	+/- 3oC of receiving water

- Note: (1) an 8 or 10 to 1 dilution of the effluent by the receiving water is assumed
 (2) the receiving water BOD is assumed to be <2 mg/l.

Source: Onwenga J.M. 1990. 4th African Water Technology Conference "Water in Africa in the next Decade."

Table 5.11.2 Specific MOWD Standards for Paper Mill and Sugar Factory Effluents.

Parameter	Unit	Pan African Paper Mill	Sugar Factories
BOD5	mg/l	80	40
Vol. SS	mg/l	60	60
Non-vol. SS	mg/l	no limit	no limit
NH4 less than	mg/l	6	15
PV (4 hour)	mg/l	25	25
Heavy metals	mg/l	1.0	1.0
Mercury	mg/l	0.05	--
Free chlorine	mg/l	1.0	--
Organo-chlorines (out-in)	mg/l	0.001	--
pH		5.0-8.5	6.0-8.5
Oil		no trace	--
Temperature rise in river after dilution		< 2 °C	< 2 °C
Toxicity:	no effect at 1.5 dilution on Barbus sp. and Alestes sp. after 48 hours.		

Source: DANIDA Nzoia River Report 1990.

Table 6.1.1 Raw Water Source for Urban Water Supply (1/3)

Code	Location	Urban Name	Future Raw Water Source	Pipe line km	Pump lift m
110.0	Nairobi	Nairobi	Thika Dam, Ndarugu, Ruiru-A, Chania-B	165.0	150
211.1	Kiambaa	Karuri	Kiambaa Dam (Rui Ruaka R.)	2.2	170
211.4	Kiambu Municipality	Kiambu	Kiambaa Dam (Rui Ruaka r.)	12.1	0
212.1	Ngenda	Gatundu & Ngenda	Thiririka River	3.2	70
213.1	Limuru	Limuru	Chania P/L	59.7	360
214.1	Ruiru	Ruiru	Ruiru River	7.5	0
214.4	Thika Municipality	Thika	Chania River (Lower)	5.5	0
215.1	Githunguri	Githunguri	Ruiru river	7.2	120
216.6	Kikuyu	Kikuyu	Kikuyu Dam	0.4	0
221.1	Tebere	Wanguru	Thiba River	5.0	0
222.2	Kiine	Sagana	Ragati River	4.1	0
222.3	Inoi	Kerugoya	Kiringa River	10.0	0
223.2	Kabaro	Kutus	Thiba River	3.3	0
231.4	Muruka	Kandara	Thika River	4.7	0
232.3	Nginda	Maragua	Githanji river	3.3	0
233.4	Iyego	Kangema	Mathiyoa River	4.5	80
234.3	Mbiri	Murang'a	Maragua river	1.8	70
235.1	Makuyu	Makuyu	Motoho river	4.7	80
241.3	Oi Kalou	Oi Kalou	Malewa River	16.0	0
254.2	Konyu	Karatina	Ragati River	6.9	0
256.1	Karima	Othaya	Tuthi river	5.0	0
257.0	Nyeri Municipality	Nyeri	Chania River	4.1	0
311.2	Mariakani	Mariakani	2nd Mzima P/L	2.4	0
313.2	Tezo	Kilifi	Rare reservoir	13.9	70
314.3	Gede	Watamu	Sabaki pipeline	20.1	0
314.4	Malindi Town	Malindi	Sabaki Pipeline & Rare Dam	49.0	0
314.6	Magarini	Mamburi	Sabaki river	5.5	60
321.1	Shimba North	Kwale	Marere pipeline	7.8	200
323.1	Kinango South	Kinango	Marere pipeline	18.7	130
324.1	Msambweni	Msambweni	Boreholes + Mkurumuji river	375.0	40
324.5	Lungalunga	Lungalunga	Umba river	1.3	40
331.0	Witu	Witu	Mkondo wa Cambi river	11.6	10
333.2	Lamu Town	Lamu	P/L from Tana River + B/H	121.0	40
340.0	Mombasa	Mombasa	2nd Mzima/Mwachi Dam, Pemba Dam	261.9	0
351.1	Taveta	Taveta	Njoro Spring	5.0	60
352.4	Voi	Voi	2nd Mzim pipeline	4.1	10
353.2	Werugha	Wundanyi	Sigaso/Manguri River	7.2	80
362.3	Bura	Bura & Madogo	Tana River	0.2	20
363.3	Zabaki	Hola	Tana River	1.3	20
364.1	Bilisa	Garsen	Tana River	0.6	20
411.8	Kangaari South	Runyenjes	Ena river	2.1	0
412.1	Nihawa	Siakago	Ena River	7.0	70
413.7	Embu Municipality	Embu	Lower Kapingazi River + Upper Rupingazi River	1.5	130
421.1	Central	Isiolo	Boreholes + Spring	1,245.0	0
421.2	Oldonyonyiro	Oi Doinyo Ng'iro	Ewaso Ng'iro River	17.0	100
422.1	Garbatula	Garbatula	Boreholes	161.0	0
423.1	Merti	Merti	Ewaso Ng'iro	1.0	10
431.4	Changwithya	Kitui	Masinga Dam	9.8	0
433.2	Mutomo	Mutomo	Sub-Surface dam on Tiva river	16.0	110
434.4	Mwingi	Mwingi	Kiambere Dam	40.5	290
441.1	Muvuti	Machakos	Athi River P/L	56.7	600
441.2	Mitaboni	Mitaboni	Kaathana River	9.9	130
442.3	Settlement Area	Athi River	Upper Athi Dam	9.9	0
444.3	Kiteta	Uaani/Tawa	Tawa river	4.1	0

Table 6.1.1 Raw Water Source for Urban Water Supply (2/3)

Code	Location	Urban Name	Future Raw Water Source	Pipe line km	Pump lift m
445.1	Kangundo	Kangundo	Pipeline from Athi River	44.0	170
445.2	Matungufu	Tala	Pipeline from Athi river	28.3	160
447.4	Kilungu	Nunguni	Kyangonyo river	6.2	440
448.1	Makueni	Wote	Kaiti river + Nzuuni river	3.9	180
448.3	Nzaut	Emali	Nol Tresh P/L	7.0	150
449.4	Mitto Andei	Mitlo Andei&Kibwezi	Pipeline from Athi river	77.0	70
451.1	North Horr	North Horr	Boreholes	232.0	0
452.2	Kargi	Kargi	Boreholes + Subsurface Dam	756.0	0
453.1	Korr	Korr	Boreholes	593.0	0
454.1	Mountain	Marsabit	Boreholes +Small dams/Sub-surface dam/Spring	1,739.0	0
455.2	Sololo	Sololo	Boreholes	726.0	0
456.1	Moyale	Moyale	Boreholes + Small Dam	608.0	0
461.4	Ntima	Meru	Kathita river	2.2	0
463.1	Nkuene	Nkubu	Thingithu River	2.0	0
464.1	Chogoria	Chogoria	North Mara River	2.8	50
464.3	Karingani	Chuka	Tungu river	7.0	0
467.2	Maua	Maua	Ura river	4.1	250
513.1	Madogasho	Mudo Gashe	Boreholes + Subsurface Dam	207.0	0
515.2	Ijara	Ijara	Boreholes + Small dam	104.0	0
515.3	Kotile	Kotile	Boreholes/Subsurface Dam/Tana	199.0	0
515.4	Masalani	Masalani	Tana River	6.3	40
519.1	Sankuri	Garissa	Tana River	3.0	10
521.1	Mandera	Mandera	Daua River	2.2	40
523.1	Elwak	Elwak	Boreholes	750.0	0
524.2	Rhamu	Rhamu	Daua River	2.2	40
532.4	Wajir Township	Wajir	Boreholes + Ewaso Ngiro River	1,456.0	20
536.2	Buna	Buna	Boreholes(Lago Bor river)	1,197.0	0
537.2	Bute	Bute	Boreholes + Small Dams	176.0	0
611.2	Erango	Manga	Bunyonyu Dam	23.9	90
611.5	East Kitutu	Keroka	Bunyonyu Dam	13.8	320
612.2	East Mugirango	Nyamira + Kebirigo	Kuja river	22.0	220
615.0	Kisii Municipality	Kisii	Bunyonyu Dam	10.9	0
617.1	Majoge Chache	Ogembo	Kuja river	4.1	0
622.1	West Kisumu	Maseno	Edzawa Dam	13.2	160
622.3	East Kisumu	Kisumu & + Kiboswa	Kibos dam	13.8	0
623.2	South East Kano	Ahero	Nyando river	0.7	20
625.2	Muhoroni	Muhoroni	Nyando River	8.4	0
632.4	West Sakwa	Bondo	Yala river	8.0	100
633.2	East Gem	Yala	Yala river	1.2	20
634.1	East Alego	Siaya	Yala River	22.0	200
635.4	North Agenya	Ukwala	Nzoia River	5.4	100
641.1	Kanyada West	Homa Bay	Lake Victoria	2.0	110
644.3	Suna East	Migori	Migori river	1.1	110
646.3	Bukira East	Kehancha + Tarang'anya	Migori river	10.8	120
646.8	Bugembe West	Nyabikaye	Boreholes	267.0	0
647.4	Central Kasipul	Oyugis	Isanta river(Awach Tende)	11.3	0
648.1	Central Karachuonyo	Kendu Bay	Lake Victoria	1.5	40
649.4	South Sakwa	Awendo/Sare	Sare river	8.3	0
711.1	Odomongi	Oloitokitok	Nol-Turesh Spring	8.3	340
712.1	Ngong	Ngong	Kerarapon Spring	5.3	120
713.1	Ildamat	Kajjado	Kiserian P/L	53.0	0
713.5	Namanga	Namanga	Namanga Spring	0.8	0
714.1	Magadi	Magadi	Oloibortoto river	34.0	0
723.1	Kepletudo	Sotik	Kipsonoi river	1.1	70

Table 6.1.1 Raw Water Source for Urban Water Supply (3/3)

Code	Location	Urban Name	Future Raw Water Source	Pipe line km	Pump lift m
725.5	Kericho Township	Kericho	Dimlitch Dam, Kimugung Dam	8.3	60
726.1	Kipkelion	Kipkelion	Nyando river	0.0	20
727.1	Londiani	Londiani	Londiani dam	6.2	0
731.5	Nanyuki	Nanyuki	Liki river	5.6	0
733.4	Rumuruti	Rumuruti	Rumuruti Dam + Borehole	120.0	0
733.9	Nyahururu Township	Nyahururu	Nyahururu dam + Borehole	645.0	0
743.2	Gilgil	Gilgil	Turasha P/L & Malewa Dam	0.0	0
744.1	Naivasha	Naivasha	Turasha P/L & Malewa Dam	30.3	0
746.1	Njoro	Njoro	Itare Dam	67.1	350
747.3	Elburgon	Elburgon	Itare Dam	49.2	350
747.5	Molo South	Molo	Itare Dam	36.9	350
749.0	Nakuru Municipality	Nakuru	Turasha P/L + Malewa Dam + Itare Dam	90.5	350
752.1	Lower Meilli	Narok	Upper Narok Dam	14.9	0
752.5	Keekonyokie	Nairagio Ngare	Nasampolai river	5.0	0
754.4	Uasin Gishu East	Kilgoris	Poroko river	1.9	130
755.1	Siria East	Lolkorian	Migori river	7.2	160
762.3	Kitale	Kitale	Koitobos river	4.4	80
762.4	Kiminiini	Kiminiini/Saboti+Spr.Kita	Kabewyan river	23.4	140
763.5	Endebess	Endebess/Kwanza	Koitobos river	2.4	20
771.2	Moi's Bridge	Moi's Bridge	Nzoia river	1.5	40
772.4	Turbo West	Turbo	Sosiani river	10.5	0
772.5	Eldoret Municipality	Eldoret	Moiben Dam + Nzoia river	100.0	410
774.6	Olare	Burnt Forest	Kipkaren river	0.4	50
812.5	Kabarnet Mosop	Kabarnet	Kirandich Dam	5.8	250
814.3	Maji Mazuri	Maji Mazuri	Maji Mazuri river	4.5	0
814.5	Eldama Ravine	Eldama Ravine	Chemususu Dam	12.7	0
815.1	Lembus Soi	Mogotio	Molo river /Chemususu Dam	3.3	0
816.2	Marigat	Marigat	Perkerra river	1.7	0
822.4	Kiptuilong	Iten+Tambach	Moiben Dam	35.2	40
831.3	Chemellil	Nandi Hills	Mokong River	7.0	170
832.2	Chemundu	Kapsabet+Baraton	Mokong river	8.8	170
841.4	Maralal	Maralal	Loikas/Yamo river	9.8	0
842.4	Wamba	Wamba	Boreholes	1,033.0	0
843.6	Elbarta	Baragoi	Boreholes + Sub-surface dam	1,640.0	0
853.5	Lodwar	Lodwar	Boreholes & sub-surface dam	1,343.0	0
861.1	Kapenguria	Kapenguria/Makulano	Kapenguria River	1.7	170
911.4	Malakisi	Mawalie + Malakisi	Malikisi river	1.5	60
912.4	Musikoma	Bungoma	Kuywa River	18.7	60
913.1	Kimilili	Kimilili	Kimilili River	5.5	0
914.2	Webuye	Webuye	Nzoia River	4.8	100
916.1	Cheptais	Chaptais	Sasuri river	0.0	20
921.5	South Teso	Busia	Sio river	13.4	100
922.2	Central Bukhayo	Nambale	Sio river	0.7	40
931.3	West Bunyoro	Luanda	Edzawa river	9.0	170
932.5	Central Maragoli	Vihiga+Majengo	Edzawa River (Kimondi River)	7.7	170
933.1	Shamakhokho	Kaimosi	Galagoli river	3.5	0
934.3	West Isukha	Khayega	Yala river	4.2	170
935.4	Kakamega Municipality	Kakamega	Isiukhu River, Mukulusi Dam	7.7	100
939.2	Central Marama	Butere	Viratsi River	1.3	80
93A.4	Central Wanga	Mumias	Nzoia River	5.1	80

Table 6.3.1 Estimated Present Land Use

(Unit : km²)

Code	District	Total Area *1	Land Area *1	Water Area *1	Forest & Park *1&*2	Swamp *2	Town- ships *1	Barren- land *2	Agriculture Land *3	Other Land
110	Nairobi	684	684	0	215	0	93	0	53	323
210	Kiambu	2,451	2,448	3	513	0	155	0	1,409	371
220	Kirinyaga	1,437	1,437	0	513	0	3	14	815	92
230	Murang'a	2,476	2,476	0	366	0	29	0	1,200	881
240	Nyandarua	3,528	3,508	20	850	22	3	31	1,487	1,115
250	Nyeri	3,284	3,284	0	1,526	0	60	5	1,104	589
310	Kilifi	12,523	12,414	109	2,650	12	412	0	1,204	8,136
320	Kwale	8,322	8,257	65	792	0	135	0	1,000	6,330
330	Lamu	6,814	6,506	308	2,534	0	119	0	200	3,653
340	Mombasa	275	210	65	8	0	143	0	59	0
350	Taita Taveta	16,975	16,959	16	10,604	131	179	0	800	5,245
360	Tana River	38,694	38,694	0	5,267	118	3	0	239	33,067
410	Embu	2,714	2,714	0	289	0	8	8	2,398	11
420	Isiolo	25,605	25,605	0	726	705	43	1,935	220	21,976
430	Kitui	29,389	29,389	0	6,572	0	161	51	968	21,637
440	Machakos	14,183	14,178	5	1,666	2	337	88	4,465	7,620
450	Marsabit	78,078	73,952	4,126	5,661	403	12	46,488	85	21,303
460	Meru	9,922	9,922	0	2,582	0	212	242	2,773	4,113
510	Garissa	43,931	43,931	0	3,425	56	251	0	12	40,187
520	Mandera	26,470	26,470	0	51	0	1	1,512	55	24,851
530	Wajir	56,501	56,501	0	291	388	145	679	25	54,973
610	Kisii	2,196	2,196	0	1	0	29	0	585	1,581
620	Kisumu	2,660	2,093	567	28	160	428	0	790	687
630	Siaya	3,528	2,523	1,005	0	96	4	0	800	1,623
640	South Nyanza	7,778	5,714	2,064	119	52	6	0	1,500	4,037
710	Kajiado	21,105	20,963	142	3,300	1,233	16	192	1,757	14,465
720	Kericho	4,890	4,890	0	1,063	0	87	0	2,330	1,410
730	Laikipia	9,718	9,718	0	938	64	187	41	446	8,042
740	Nakuru	7,200	7,024	176	1,460	94	946	173	4,122	229
750	Narok	18,513	18,513	0	2,887	69	13	89	1,300	14,155
760	Trans Nzoia	2,468	2,468	0	451	110	86	0	1,777	44
770	Uasin Gishu	3,784	3,784	0	661	42	60	0	1,247	1,774
810	Baringo	10,790	10,627	163	835	128	11	636	1,078	7,939
820	Elgeyo Marakwet	2,722	2,722	0	900	40	1	0	1,328	453
830	Nandi	2,745	2,745	0	415	0	4	0	171	2,155
840	Samburu	20,809	20,809	0	3,288	0	13	3,568	50	13,890
850	Turkana	69,684	67,405	2,279	826	2,551	66	17,984	69	45,909
860	West Pokot	9,056	9,056	0	548	3	3	1,454	1,470	5,578
910	Bungoma	3,074	3,074	0	552	0	31	0	2,188	303
920	Busia	1,766	1,629	137	2	184	1	0	455	987
930	Kakamega	3,520	3,520	0	332	1	1	0	2,548	638
Total		592,262	581,012	11,250	65,707	6,664	4,497	75,190	46,582	382,372

Note : *1 : Ref.E.4

*2 : Landsat image

*3 : Ref.E.45

Table 6.3.2 Food Demand Projection

Unit : 1,000 ton

Crop	Per Capita Consumption			1990			1995			2000			2005			2010		
	Urban (kg/p/yr)	Rural (kg/p/yr)	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Population (million)			4.0	18.8	26.4	5.5	20.9	30.7	7.9	22.8	35.2	10.1	25.1	40.3	12.7	27.6	43.7	
Maize	97.1	125.6	385	2,359	2,744	536	2,622	3,157	770	2,861	3,631	978	3,157	4,135	1,233	3,467	4,700	
Millet	0.0	19.8	0	372	372	0	413	413	0	451	451	0	498	498	0	547	547	
Wheat	24.7	10.0	98	188	286	136	209	345	196	228	424	249	251	500	314	276	590	
Rice	13.1	1.4	52	26	78	72	29	101	104	32	136	132	35	167	166	39	205	
Potatoes	14.8	26.2	59	492	551	82	547	629	117	597	714	149	659	808	188	723	911	
Other roots	3.0	30.5	12	573	585	17	637	653	24	695	719	30	767	797	38	842	880	
Sugar	30.0	15.0	119	282	401	166	313	479	238	342	580	302	377	679	381	414	795	
Pulses	13.8	14.2	55	267	321	76	296	373	110	324	433	139	357	496	175	392	567	
Milk	88.6	72.1	351	1,354	1,706	489	1,505	1,994	703	1,642	2,345	893	1,812	2,705	1,125	1,991	3,116	
Beef	11.9	6.8	47	128	175	66	142	208	94	155	249	120	171	291	151	188	339	
Fat	6.5	1.7	26	32	58	36	36	71	52	39	90	66	43	108	83	47	129	
Vegetable	36.9	20.4	146	383	530	204	426	629	293	465	757	372	513	885	469	563	1,032	
Fish	1.9	1.7	8	32	39	11	36	46	15	39	54	19	43	62	24	47	71	

Table 6.3.3 Land Use Plan in 2010

Code	District	Total Area	Land Area	Water Area	Forest & Park	Swamp	Townships	Barren-land	Agriculture Land	Other Land
		(km2) *1	(km2) *1	(km2) *1	(km2) *1&*2	(km2) *2	(km2) *1	(km2) *2	(km2) *3	(km2) *4
110	Nairobi	684	684	0	215	0	125	0	63	281
210	Kiambu	2,451	2,448	3	513	0	208	0	1,658	69
220	Kirinyaga	1,437	1,437	0	513	0	4	14	795	111
230	Murang'a	2,476	2,476	0	366	0	39	0	1,412	659
240	Nyandarua	3,528	3,508	20	850	22	4	31	1,750	851
250	Nyeri	3,284	3,284	0	1,526	0	80	5	1,299	374
310	Kilifi	12,523	12,414	109	2,650	12	554	0	1,417	7,781
320	Kwale	8,322	8,257	65	792	0	181	0	1,177	6,107
330	Lamu	6,814	6,506	308	2,534	0	160	0	235	3,577
340	Mombasa	275	210	65	8	0	192	0	10	0
350	Taita Taveta	16,975	16,959	16	10,604	131	241	0	941	5,042
360	Tana River	38,694	38,694	0	5,267	118	4	0	281	33,024
410	Embu	2,714	2,714	0	289	0	10	8	2,407	0
420	Isiolo	25,605	25,605	0	726	705	57	1,935	259	21,923
430	Kitui	29,389	29,389	0	6,572	0	216	51	1,139	21,411
440	Machakos	14,183	14,178	5	1,666	2	453	88	5,253	6,716
450	Marsabit	78,078	73,952	4,126	5,661	403	16	46,488	100	21,284
460	Meru	9,922	9,922	0	2,582	0	285	242	3,263	3,550
510	Garissa	43,931	43,931	0	3,425	56	338	0	14	40,098
520	Mandera	26,470	26,470	0	51	0	1	1,512	65	24,841
530	Wajir	56,501	56,501	0	291	388	195	679	29	54,919
610	Kisii	2,196	2,196	0	1	0	39	0	688	1,468
620	Kisumu	2,660	2,093	567	28	160	576	0	930	399
630	Siaya	3,528	2,523	1,005	0	96	5	0	941	1,481
640	South Nyanza	7,778	5,714	2,064	119	52	8	0	1,765	3,770
710	Kajiado	21,105	20,963	142	3,300	1,233	21	192	2,067	14,150
720	Kericho	4,890	4,890	0	1,063	0	117	0	2,741	969
730	Laikipia	9,718	9,718	0	938	64	251	41	525	7,899
740	Nakuru	7,200	7,024	176	1,460	94	1,274	173	4,023	0
750	Narok	18,513	18,513	0	2,887	69	17	89	1,529	13,922
760	Trans Nzoia	2,468	2,468	0	451	110	115	0	1,792	0
770	Uasin Gishu	3,784	3,784	0	661	42	80	0	1,467	1,534
810	Baringo	10,790	10,627	163	835	128	14	636	1,268	7,746
820	Elgeyo Marakwet	2,722	2,722	0	900	40	1	0	1,562	219
830	Nandi	2,745	2,745	0	415	0	5	0	201	2,124
840	Samburu	20,809	20,809	0	3,288	0	17	3,568	59	13,877
850	Turkana	69,684	67,405	2,279	826	2,551	88	17,984	81	45,875
860	West Pokot	9,056	9,056	0	548	3	4	1,454	1,729	5,318
910	Bungoma	3,074	3,074	0	552	0	41	0	2,073	408
920	Busia	1,766	1,629	137	2	184	1	0	535	907
930	Kakamega	3,520	3,520	0	332	1	1	0	2,457	729

Kenya 592,262 581,012 11,250 65,707 6,664 6,038 75,190 52,000 375,413

*1 : Ref. E.4

*2 : Landsat image

*3 : Ref. E.45

*4 : includes grassland and bushland

Table 6.4.1 Selected Damsites for Source Development toward Year 2010

Item No.	Prospective Damsites	Sub- River basin (damsite)	Catchment Area (km ²)	Study Stage	Purpose	N.W.L. (El.m)	L.W.L. (El.m)	Reservoir			Dam Embankment			Remarks		
								Dead Storage (MCM)	Active Storage (MCM)	Gross Storage Area (FSL) (ha)	Yield (m ³ /s)	Dam Crest Height (El.m)	Dam Height (m)		Volume (1,000 m ³)	
1	Moiben	1BA Moiben	188	D/D	W	2,361.6	2,337.1	1.22	18.38	19.60	137	0.68	58,666	2,366.6	42	414 under D/D
2	* Mukulusi	1EA Mukulusi	341	M/P	W	1,510.1	1,508.5	11.60	5.39	16.99	227	1.10	95,040	1,515.1	8	21 small dam
3	Londiani	1GC Kipchorian	71	M/P	W	2,325.6	2,297.2	1.60	49.30	50.90	436	0.47	40,608	2,330.6	50	1,720
4	Kibos	1HA Kibos	179	M/P	W	1,482.1	1,471.6	2.20	4.93	7.13	68	0.95	82,080	1,487.1	39	700
5	Itare	1JA Itare	185	M/P	W	2,400.5	2,379.7	1.11	12.48	13.59	97	1.73	149,472	2,405.5	35	623
6	Magwagwa	1JG Sondu	3,160	F/S	P,I	1,665.0	1,603.0	107.00	701.00	808.00	2349	-	-	1,670.0	**110	4,388
7	* Bunyunyu	1KB Kuja	120	M/P	W	1,834.3	1,832.7	3.40	1.34	4.74	243	0.61	52,704	1,837.3	16	108
8	Malewa	2GB Malewa	635	F/S	W	2,149.0	2,123.5	15.88	55.83	71.70	332	1.37	118,714	2,154.0	80	1,170
9	Upper Narok	2KA Ewaso Narok	516	M/P	W	1,985.5	1,975.5	3.10	6.99	10.09	79	1.20	103,680	1,988.5	29	368
10	Oldorko	2KB E.Ngiro S.	5,696	Pre-F/S	P,I,W	1,300.0	1,272.0	71.20	885.22	956.42	5115	-	-	1,305.0	** 55	4,480
11	Upper Athi	3AA Athi	400	Pre-F/S	W	1,551.7	1,542.9	3.00	7.30	10.30	112	0.30	25,920	1,554.7	26	171
12	* Ruiru-A	3BC Ruiru	202	M/P	W	1,898.9	1,855.8	1.21	17.83	19.04	87	0.35	30,240	1,903.9	69	1,528
13	* Kikuyu	3BA Nairobi	81	M/P	W	2,006.6	1,989.9	0.49	10.50	10.99	106	0.25	21,600	2,009.6	25	221
14	Ndarugu	3CB Ndarugu	360	M/P	W,I	1,451.3	1,429.8	9.27	214.95	224.22	1876	6.10	527,040	1,456.3	36	1,302
15	Yata	3FB Athi	20,000	M/P	W	782.1	764.2	100.00	280.20	380.20	2561	13.50	1,166,400	787.1	52	4,988
16	Rare	3LA Rare	6,246	F/S	W	91.1	82.5	6.00	31.27	37.27	551	0.50	43,200	94.1	21	502 Off-stream reservoir
17	Mwachi	3MB Mwachi	7,497	M/P	W	85.6	39.5	8.00	105.00	113.00	526	2.75	237,600	90.6	77	3,217
18	Pemba	3MC Pemba	866	M/P	W	-	-	-	-	-	-	0.23	19,872	-	weir	- run-of-river type weir
19	Chanis- B	4CA Chanis	338	M/P	W,I	1,790.6	1,720.6	2.03	48.99	51.02	150	1.30	112,320	1,795.6	101	3,816
20	Thiba	4DA Thiba	173	F/S	I	1,380.0	1,359.0	1.30	16.73	18.03	122	-	-	1,385.0	** 35	1,200
21	Mutonga	4FA Tana	15,329	Pre-F/S	P	550.0	542.0	268.26	87.81	356.07	1090	-	-	554.0	42	870
22	Low Grand Falls	4FB Tana	17,459	Pre-F/S	P	512.0	500.0	742.01	857.78	1,599.79	6720	-	-	516.0	79	5,820
23	Rumuruti	5AA Ewaso Narok	673	Pre-F/S	W	2,012.8	2,010.4	2.00	0.95	2.95	63	0.03	2,592	2,015.8	16	109
24	Nyahururu	5AA Nyahururu	29	M/P	W	2,400.0	2,380.9	0.17	10.23	10.40	116	0.26	22,464	2,403.0	20	72
Committed Dam Schemes																
25	Sondu/Miritu	1JG Sondu	3,360	D/D	P,I	-	-	-	-	-	-	-	-	-	weir	- run-of-river type weir
26	Chemususu	2ED Perikera	63	D/D	W	2,336.5	2,315.5	1.51	9.44	10.95	82	0.41	35,000	2,340.0	45	757
27	Krandich	2EH Krandich	28	D/D	W	1,774.4	1,756.5	0.75	3.25	4.52	28	0.13	11,000	1,780.0	50	420
28	Ruaka (Kiambaa)	3BA Ruaka	100	D/D	W	1,755.7	1,747.7	0.60	2.07	2.67	29	0.12	10,000	1,758.7	18	120

Notes: Marked "*" shows a damsite newly identified in this Study.

Purpose, W = water supply, I = irrigation, P = hydroelectric power.

Study stage, M/P = mater plan, Pre-F/S = prefeasibility study, F/S = feasibility study

/1 Active storage = (required storage capacity for w/s) + (reservoir evaporation loss)

/2 Dam height above riverbed, while marked "*" shows a dam height from foundation.

/3 Dam features above arc based on the detailed design report.

Table 6.4.2 List of Intra-basin Water Transfer Schemes

No.	Intra-basin Water Transfer			Yield for D & I Water (m ³ /day)	Remarks
	Sub- Drainage Area	Water Source	Sub- Drainage Area		
1	1AG	Sio River*	1AH	Busia	8,928
2	1BA	Moiben Dam	1CB	Eldoret	51,000
3	1EA	Mukulusi Dam	1EB	Kakamega	27,027
4	1GC	Londiani Dam	1GC	Londiani	1,663
5	1HA	Kibos Dam	1HA	Kisumu	72,432
6	1KB	Bunyonyu Dam	1KA	Kisi	20,153
			1KB	Keroka	1,376
7	2ED	Chemususu Dam	2EF	Eldama Ravine	5,596
			2EF	Mogotio	1,209
8	2GB	Malewa Dam	2GC	Gilgil	11,096
			2GD	Naivasha	29,336
9	2KA	Upper Narok Dam	2KA	Narok	13,248
10	3AA	Upper Athi Dam	3AA	Athi River	11,002
11	3BA	Kikuyu Dam	3BA	Kikuyu	9,239
12	3BA	Kiambaa Dam	3BA	Karuri	7,431
			3BA	Kiambu	4,209
13	3BC	Ruiru A Dam	3AA	Nairobi	25,920
14	3CB	Ndarugu Dam	3BA	Nairobi	299,163
15	3AC	Mumyu Dam	3BA	Nairobi	299,163
16	3DA	Athi River*	3EA	Machakos	53,078
17	3DA	Athi River*	3EA	Kangundo	6,619
18	3DA	Athi River*	3EA	Tala	1,872
19	3FA	Athi River*	3FC	Mtito Andei	2,015
20	3MC	Pemba Dam	3MD2	Mombasa	2,592
21	3MB	Mwachi Dam	3MD1	Mombasa	103,445
22	3LA	Rare Dam	3LB	Malindi	9,768
23	5AA	Nyahururu Dam	5AA	Nyahururu	8,415
24	5AA	Rumuruti Dam	5AA	Rumuruti	1,539

Note : Marked "*" means intra-basin water transfer scheme without dam.

Table 6.4.3 List of Inter-basin Water Transfer Schemes

No.	Intra-basin Water Transfer			Yield for D & I Water (m ³ /day)	Remarks
	Sub- Drainage Area	Water Source	Sub- Drainage Area		
1	IBA	Moiben Dam	2CB	Iten & Tambach	2,538
2	IFF	Edzawa Dam***	1HB	Maseno	17,407
3	1JA	Itare Dam	2EC	El burgon	9,664
			2EG1	Molo	8,715
			2FC	Njoro	7,049
4	2GB	Malewa Dam	2FC	Nakuru	86,400
5	2EH	Kirandich Dam	2FC	Nakuru	17,951
6	2KB	Oloibortoto River*	2CB	Kabarnet	4,147
7	3AA	Kiserian Dam	2H	Magadi	2,328
8	3G	Second Mzima*	3FA	Kajiado	5,377
			3LA	Voi	5,235
9	3HC	Sabaki Extension*	3MD2	Mombasa	25,920
			3MD2	Mombasa	25,920
10	4CA	Chania B Dam	3LB	Malindi	18,005
11	4CA	Komu transfer*	3BA	Nairobi	65,664
12	4CA	Komu transfer*	3CB	Ndarugu Dam	691,200
13	4CB	Thika Dam System	3DA	Munyu Dam	691,200
14	4DE	Masinga Dam**	3AA	Nairobi	224,640
15	4GF	Tana River*	4HA	Kitui	5,470
16	5ED	Ewaso Ngiro	3KB	Lamu	5,719
			5EA	Wajir	6,235

Note: Marked "*" means inter-basin water transfer scheme without dam.

Marked "***" means existing dam.

Marked "****" means small dam.

Table 6.4.4 Water Balance Calculation of Urban Water Supply for the Year 2010 (1/2)

Urban center	Location Name	Code	Total W/D (m3/year)	Safe Yield Borehole (m3/year)	Safe Yield Shallow well (m3/year)	Total Safe Yield (m3/year)	Water Balance Calculation			
							1.0*B/H	0.9*B/H+ 0.1*S/W	0.75*B/H+ 0.25*S/W	0.5*B/H+ 0.5*S/W
							[1]	[2]	[3]	[4]
Msambweni	Msambweni	324.1	974732.5	89165	119279	208444	-885567.5	-882556	-878039	-870511
	Shirazi/Funzi	324.2	2670.5	38557	43956	82513	-847010.5	-843459	-838132	-829254
	Pongwe/Kidimu	324.3		120131	130866	250997	-726879.5	-722255	-715318	-703756
	Kikoneni	324.7		356981	316094	673075	-369898.5	-369362	-368558	-367218
	Diani	324.8		94421	185946	280367	-275477.5	-265789	-251256	-227035
	Lukore	322.3		56109	87278	143387	-219368.5	-206563	-187355	-155341
	Majimboni	322.4		40839	91570	132409	-178529.5	-160651	-133833	-89137
	Mkongani	322.1		113313	167910	281223	-65216.5	-41878	-6871	51475
	Mwaluphamba	322.2		118599	149311	267910	53382.5	79792	119406	185430
	Shimba Hills Nat.	322.5		147700	195156	342856	201082.5	232238	278970	356858
Shimba North	321.1			38610	114398	153008	239692.5	278426	336527	433362
Isiolo	Central	421.1	3410012.5	3551265	430186	3981451	141252.5	-170855	-639017	-1419287
	Kiirua	461.1	9342.5	196205	1530	197735	337457.5	5882	-491481	-1320420
	Timau	469.0		380195	25233	405428	717652.5	350581	-200027	-1117706
	Mituntu	465.8		26312	0	26312	743964.5	374262	-180293	-1104550
	Akithi	465.6		24024	0	24024	767988.5	395883	-162275	-1092538
	Ilgwesi	732.1		38324	208451	246775	806312.5	451220	-81419	-969150
	Mukogodo	732.2		217521	384071	601592	1023833.5	685396	177740	-668354
	Garbatula	422.1	517205	1869638	2062643	3932281	1352433	1371734	1400684	1448936
North Horr	North Horr	451.1	444570	1614052	5510018	7124070	1169482	1559079	2143474	3117465
	Dukana	451.2	1218	1016308	3410604	4426912	2185790	2814816	3758356	5330921
	Maikona	451.3		6641398	2301741	8943139	8827188	9022249	9314839	9802491
Korr	Korr	453.1	1228590	1088507	2165716	3254223	-140083	-32362	129219	398522
Kargi	Kargi	452.2	1182965	1877868	3680897	5558765	694903	875206	1145660	1596418
	Maikona	451.3	3241	6641398	2301741	8943139	7336301	7082638	6702144	6067987
	Korr	451.1		1088507	2165716	3254223	8424808	8278866	8059953	7695099
Marsabit	Mountain	454.1	3274415	145575	0	145575	-3128840	-3143398	-3165234	-3201628
	Kararo	454.2	8971	86516	0	86516	-3042324	-3065533	-3100347	-3158370
	Sagante	454.3		77078	0	77078	-2965246	-2996163	-3042538	-3119831
	Maikona	451.3		6641398	2301741	8943139	3676152	3211269	2513946	1351739
	Korr	453.1		1088507	2165716	3254223	4764659	4407497	3871755	2978851
	Logologo	453.2		4300497	4918022	9218519	9065156	8769747	8326633	7588110
Sololo	Sololo	455.2	1017255	1088507	2165716	3254223	71252	178973	340554	609857
	Uran	455.1	2787	4300497	4918022	9218519	4371749	4541222	4795433	5219116
Moyale	Moyale	456.1	2148025	7865	46751	54616	-2140160	-2136271	-2130439	-2120717
	BUIIYE	456.2	5885	164926	937165	1102091	-1975234	-1894122	-1772453	-1569672
	Godoma	456.3		55563	1048967	1104530	-1919671	-1739218	-1468539	-1017407
	Sololo	455.2		1088507	2165716	3254223	-831164	-542990	-110730	609705
	Godoma	537.3		61204	392045	453249	-769960	-448702	33185	836330
	Bute	537.2		150580	965509	1116089	-619380	-216629	387497	1394374
	Gurar	537.1		340342	2183086	2523428	-279038	307987	1188525	2656088
	Madogashe	513.1	409165	209496	1388865	1598361	-199669	-81732	95173	390016
Mudo Gashe	Madogashe/ Eldera	422.4	1121	324612	2186539	2511151	124943	429073	885267	1645591
	Garufa	513.2		1989299	2754984	4744283	2114242	2494940	3065987	4017733
	Ejara	515.2	194910	104677	664941	769618	-90233	-34207	49833	189899
Ijara	Sangailu	515.1	534	301589	1916152	2217741	211356	428839	755063	1298770
	Masalani	515.4		127271	808577	935848	338627	624240	1052660	1766694
	Bura	516.0		1072078	6811702	7883780	1410705	2270281	3559644	5708584
	Kotile	515.3	194910	174903	821262	996165	-20007	44629	141583	303173
Kotile	Ndera	364.2	534	101245	727895	829140	81238	208539	399490	717743
	Salama	364.3		93624	675846	769470	174862	360385	638670	1102478
	Gwano	363.6		149549	238166	387715	324411	518796	810373	1296335
	Elwak	523.1	1522050	657232	4144583	4801815	-864818	-516083	7020	878858
Kotulo	523.2	4170	1698649	1311485	3010134	833831	1143850	1608878	2383925	

[1] : 100% of the water demand by boreholes

[2] : 90% of the water demand by boreholes and 10% of the water demand by shallow wells

[3] : 75% of the water demand by boreholes and 25% of the water demand by shallow wells

[4] : 50% of the water demand by boreholes and 50% of the water demand by shallow wells

Table 6.4.4 Water Balance Calculation of Urban Water Supply for the Year 2010 (2/2)

Urban center	Location Name	Code	Total W/D (m3/year)	Safe Yield Borehole (m3/year)	Safe Yield Shallow well (m3/year)	Total Safe Yield (m3/year)	Water Balance Calculation			
							1.0*B/H	0.9*B/H+ 0.1*S/W	0.75*B/H+ 0.25*S/W	0.5*B/H+ 0.5*S/W
							[1]	[2]	[3]	[4]
Wajir	Wajir	532.4	2244020	19755	131972	151727	-2224265	-2213043	-2196211	-2168157
	Kulaley	532.1	6148	895833	3515127	4410960	-1328432	-1055281	-645554	37324
	Wargadud	532.2		270415	1733129	2003544	-1058017	-638595	-9461	1039096
	Tarbaj	532.3		1503058	4054654	5557712	445041	1119623	2131496	3817952
	Wugala	535.1		275563	2061662	2337225	720604	1573796	2853584	4986564
Buna	Buna	536.2	1112155	674923	3934488	4609411	-437232	-111276	377659	1192551
	Korondile	536.1	3047	752169	3629873	4382042	314937	928664	1849254	3383572
Bute	Bute	537.2	360985	150580	965509	1116089	-210405	-128912	-6673	197060
	Curar	537.1	989	340342	2183086	2523428	129937	395704	794355	1458774
	Godoma	537.3		61204	392045	453249	191141	489992	938270	1685398
Nyabikaye	Bugembe West	646.8	500050	261359	1295	262654	-238691	-264697	-303707	-368723
	Suna East	644.3	1370	68578	191966	260544	-170113	-183781	-204282	-238451
	Suna West	645.1		104722	269677	374399	-65391	-62563	-58321	-51252
	Burira West	646.4		235370	15680	251050	169979	150838	122126	74274
	Bugembe East	646.7		71611	54018	125629	241590	220690	189339	137088
Wamba	Wamba	842.4	950460	106867	767664	874531	-843593	-777513	-678394	-513195
	Ngilai	842.2	2604	853559	2915929	3769488	9966	282283	690758	1371550
	Lodungokwe	842.3		305715	912618	1218333	315681	648688	1148199	1980716
	Wasa	842.5		419861	2575018	2994879	735542	1284065	2106849	3478156
Barogoi	Elbarta	843.6	821980	165303	1039373	1204676	-656677	-569270	-438160	-219642
	Nachola	843.2	2252	75353	220684	296037	-581324	-479384	-326474	-71624
	Kowop	843.3		198683	410643	609326	-382641	-259505	-74801	233040
	Nyiro	843.4		180467	738043	918510	-202174	-23280	245060	692295
	Ndooto	843.5		545312	1237316	1782628	343138	591232	963373	1583609
Lodwar	Lodwar	853.5	2844080	718467	1463628	2182095	-2125613	-2051097	-1939323	-1753033
	Ngisir	853.2	7792	56441	864459	920900	-2069172	-1913854	-1680877	-1292583
	Kalokol	853.3		1016992	1896923	2913915	-1052180	-808869	-443903	164375
	Kangatotha	853.4		6021099	5539463	11560562	4968919	5164066	5456788	5944656
	Kalapata	854.2		829756	2137924	2967680	5798675	6124639	6613586	7428496
Nyahururu	Nyahururu	733.9	1563021	10709	0	10709	-1552312	-1553383	-1554989	-1557667
	Mutara	733.1	4282.25	407081	100070	507151	-1145231	-1177003	-1224661	-1304091
	Sosiani	733.2		602617	232237	834854	-542614	-611424	-714639	-886664
	Rumuruti	733.4		22451	12784	35235	-520163	-589940	-694605	-869047
	Marmamet	733.5		140517	0	140517	-379646	-463474	-589217	-798788
	Salama	733.6		95365	15506	110871	-284281	-376095	-513817	-743353
	Mutitu	733.7		29122	0	29122	-255159	-349886	-491975	-728792
	Igwamiti	733.8		5578	0	5578	-249581	-344865	-487792	-726003
	Dundori	241.1		105183	11636	116819	-144398	-249037	-405996	-667593
	Rurii	241.2		46166	0	46166	-98232	-207488	-371371	-644510
	Ol'Joro Orok	242.1		31090	0	31090	-67142	-179507	-348054	-628965
	Gathanji	242.2		28743	0	28743	-38399	-153638	-326496	-614594
	Shamata	243.2		32318	18063	50381	-6081	-122745	-297742	-589403
	Kirita	243.3		8866	0	8866	2785	-114766	-291093	-584970
	Ndaragwa	243.1		65780	32254	98034	68565	-52339	-233694	-535953
	Mathingira	243.4		21237	0	21237	89802	-33225	-217766	-525335
	Leshau	243.5		10153	0	10153	99955	-24088	-210152	-520258
	Gituamba	734.1		127935	0	127935	227890	91054	-114200	-456291
	Weseges	741.1		25025	0	25025	252915	113576	-95432	-443778
	Maji Tarnu	741.2		13585	0	13585	266500	125803	-85243	-436986
Subukia	741.3		14872	0	14872	281372	139188	-74089	-429550	
Kabazi	742.1		73050	0	73050	354422	204933	-19301	-393025	
Rumuruti	Rumuruti	733.4	284864	22451	12784	35235	-262413	-263380	-264830	-267247
	Mutara	733.1	780.45	407081	100070	507151	144668	113000	65499	-13671
	Sosiani	733.2		602617	232237	834854	747285	678579	575521	403756
	Marmamet	733.5		140517	0	140517	887802	805045	680908	474015
	Salama	733.6		95365	15506	110871	983167	892424	756309	529450

[1] : 100% of the water demand by boreholes

[2] : 90% of the water demand by boreholes and 10% of the water demand by shallow wells

[3] : 75% of the water demand by boreholes and 25% of the water demand by shallow wells

[4] : 50% of the water demand by boreholes and 50% of the water demand by shallow wells

Table 6.4.5 Water Source Allocation for Rural and Livestock Water Supply

Drainage Area	Purpose on water supply	Surface Water				Groundwater			Water Harvesting				Existing Pipeline		Total
		Water	Borehole	S. well	Roof Catch	Small Dam	S. Surface		Rock Catch	S. Surface Dam	Sand Dam	Rock Catch	Pipeline		
							Dam	Dam							
1	Domestic	426,672	46,296	83,403	15,492	19,676	286	277	530	14,071	606,703				
	Livestock	129,697	12,046	23,174	0	6,183	98	98	0	149	171,445				
	Total	556,369	58,342	106,577	15,492	25,859	384	375	530	14,220	778,148				
2	Domestic	42,916	34,103	13,457	8,169	3,005	469	366	285	15,019	117,789				
	Livestock	51,952	59,179	50,964	0	4,014	1,663	1,831	0	1,980	171,583				
	Total	94,868	93,282	64,421	8,169	7,019	2,132	2,197	285	16,999	289,372				
3	Domestic	52,319	22,995	31,960	10,279	3,319	634	561	277	35,336	157,680				
	Livestock	20,190	13,234	16,904	0	1,358	243	273	0	531	52,733				
	Total	72,509	36,229	48,864	10,279	4,677	877	834	277	35,867	210,413				
4	Domestic	159,459	24,374	24,641	6,879	8,008	470	382	601	6,917	231,731				
	Livestock	30,214	13,192	19,183	0	1,539	360	306	0	154	64,948				
	Total	189,673	37,566	43,824	6,879	9,547	830	688	601	7,071	296,679				
5	Domestic	14,261	16,762	8,681	3,057	969	312	331	454	990	45,817				
	Livestock	16,436	36,024	41,095	0	1,310	1,109	1,748	0	300	98,022				
	Total	30,697	52,786	49,776	3,057	2,279	1,421	2,079	454	1,290	143,839				
Total	Domestic	695,627	144,530	162,142	43,876	34,977	2,171	1,917	2,147	72,333	1,159,720				
	Livestock	248,489	133,675	151,320	0	14,404	3,473	4,256	0	3,114	558,731				
	Total	944,116	278,205	313,462	43,876	49,381	5,644	6,173	2,147	75,447	1,718,451				

Table 6.4.6 Watering Points in Nomadic Pasturage Area

District Code	Project	Assumed Nomadic Pasturage Area (km ²)	No. of Watering Points (Nos)	Cost (million US\$)
<u>Nairobi Province</u>				
110	Nairobi	-	-	-
<u>Central Province</u>				
210	Kiambu	-	-	-
220	Kirinyaga	-	-	-
230	Murang'a	-	-	-
240	Nyandarua	-	-	-
250	Nyeri	-	-	-
<u>Coast Province</u>				
310	Kilifi	7,562	12	2.0
320	Kwale	5,503	9	1.6
330	Lamu	3,481	6	1.0
340	Mombasa	-	-	-
350	Taita Taveta	4,889	8	1.3
360	Tana River	32,277	52	7.8
<u>Eastern Province</u>				
410	Embu	-	-	-
420	Isiolo	21,423	34	4.3
430	Kitui	20,889	33	4.6
440	Machakos	6,424	10	1.4
450	Marsabit	20,305	32	4.2
460	Meru	3,098	5	0.7
<u>Northeastern Province</u>				
510	Garissa	39,187	63	10.0
520	Mandera	23,946	38	4.6
530	Wajir	53,124	85	9.6
<u>Nyanza Province</u>				
610	Kisii/Nyamira	-	-	-
620	Kisumu	-	-	-
630	Siaya	-	-	-
640	South Nyanza	-	-	-
<u>Rift Valley Province</u>				
710	Kajiado	13,830	22	2.7
720	Kericho	-	-	-
730	Laikipia	7,530	12	1.7
740	Nakuru	-	-	-
750	Narok	13,481	22	2.8
760	Trans Nzoia	-	-	-
770	Uasin Gishu	-	-	-
810	Baringo	7,087	11	1.7
820	Elgeyo Marakwet	-	-	-
830	Nandi	1,690	3	0.4
840	Samburu	13,563	22	2.1
850	Turkana	44,837	72	7.9
860	West Pokot	4,855	8	0.9
<u>Western Province</u>				
910	Bungoma	-	-	-
920	Busia	-	-	-
930	Kakamega/Vihiga	-	-	-
Total		348,981	559	73.3

Note : Normadic pasturage area assumed to be bushland and grassland in ASAL area after deleting area for managed pasture. (see Table F1.9 of Sectoral Report F)

Table 6.5.1 Preliminary Screening Results of Hydroelectric Projects

Projects	Capacity		Annual Energy		Capital Cost		Cost of Capacity		Long Term Energy Cost		
	Installed (MW)	Firm (MW)	Firm (GWh)	Average (GWh)	General (MUSS)	Transm. (MUSS)	Total (MUSS)	Installed (\$/kW)	Firm (\$/kW)	Firm Average (\$/kWh)	
Muronga (2)	2 x 30	40.8	202	234	153.8	5.3	159	2,677	3,898	0.099	0.085
Low Grand Falls (2)	2 x 60	88.3	482	594	290.8	14.7	306	2,572	3,460	0.085	0.073
High Grand Falls (2)	3 x 60	141.4	692	802	589.3	9.0	598	3,357	4,231	0.129	0.123
Adamson's Falls (2)	2 x 40	62.8	307	358	225.2	9.2	234	2,959	3,732	0.100	0.086
Kora (2)	2 x 46	68.2	342	401	250.8	20.9	272	2,983	3,984	0.101	0.088
Magwagwa (3)	2 x 47.3	48.9	333	438	352.6	16.3	369	3,939	7,544	0.145	0.113
Low Miriu (4)	2 x 24.3	48.6	140	261	100.2	5.0	105	2,186	2,164	0.101	0.054
Mid Miriu	2 x 33 + 2 x 8	131.0	175	670	213.5	19.6	213	1,575	1,780	0.179	0.048
High Moriu (3)	2 x 42 + 2 x 8	72.0	342	675	329.5	9.7	339	3,392	4,711	0.130	0.071
Low Miriu+Magwagwa (3)	143.2	97.5	473	699	452.8	21.3	474	3,310	4,862	0.122	0.089
Nandi Forest	2 x 25	46.0	249	255	189.3	3.9	193	3,903	4,200	0.101	0.099
Leshota	2 x 21	35.7	86	111	195.7	0.0	196	4,707	5,482	0.278	0.215
Oldoriko (1)	2 x 38	69.4	149	236	206.3	0.0	206	2,742	2,973	0.153	0.131
Sererwa	2 x 30	60.0	161	161	82.0	0.0	82	1,367	1,367	0.065	0.065

1 - Not including transmission costs.

2 - Not including additional transmission from Tana to Nairobi.

3 - Not including additional transmission from Lessos to Nairobi.

4 - Not including benefits of irrigation water supply.

Sources : National Power Development Plan (1987), Main Report Table 8.2

**Table 6.5.2 Recommended Generation Expansion Plan
(Update of NPDP,1991)**

Fisical Year	Hydro	Geo-thermal	Low-Speed Diesel	M-Speed Diesel	Gas Turbine
1990/91					
1991/92	Turkwel				
1992/93					
1993/94				90	
1994/95		2 x 32			
1995/96					1 x 60
1996/97		1 x 55			
1997/98	Sondu/Miriu				
1998/99		1 x 55			
1999/00			50		
2000/01	Low G.Falls				
2001/02		1 x 55			
2002/03	Oldorko		50		
2003/04	Gitaru #3	1 x 55			
2004/05			100		
2005/06	Mutonga				
2006/07		1 x 55			
2007/08			100		
2008/09		1 x 55			
2009/10			100		
Total	384MW	394MW	400MW	90MW	60MW

Source : Interim Report of Update of National Development Plan (1990)
Draft Final Report, Table 2.1, April 1991, Acres

Table 6.6.1 List of Proposed Urban Drainage Schemes

Town Name	Location of Town Centre		Town Area (km ²)	Estimated Const. Cost (1000 \$)	Remarks
	District	Location Name			
1 Nairobi	110	Nairobi	90.00	360,000	*1
2 Kiambu	210	Kiambu	211.4	12,920	
3 Thika	210	Kiambu	214.4	14,800	*1
4 Kerugoya	220	Kirinyaga	222.3	7,680	
5 Murang'a	230	Murang'a	234.3	31,500	
6 OIkalou	240	Nyandarua	241.3	5,980	
7 Nyeri	250	Nyeri	257.0	13,120	*1
8 Kilifi	310	Kilifi	313.2	4,940	
9 Malindi	310	Kilifi	314.4	7,600	*1
10 Kwale	320	Kwale	321.1	7,200	
11 Lamu	330	Lamu	333.2	7,000	
12 Mombasa	340	Mombasa	340.0	46,550	*1
13 Voi	350	Taita Taveta	352.4	9,200	
14 Wundanyi	350	Taita Taveta	353.2	2,240	
15 Hola	360	Tana River	363.3	7,400	
16 Embu	410	Embu	413.7	7,600	
17 Isiolo	420	Isiolo	421.1	3,600	
18 Kitui	430	Kitui	431.4	3,640	
19 Machakos	440	Machakos	441.1	22,080	*1
20 Mitaboni	440	Machakos	441.2	1,600	*1
21 Marsabit	450	Marsabit	454.1	840	
22 Meru	460	Meru	461.4	2,700	*1
23 Garissa	510	Garissa	519.1	6,400	*1
24 Mandera	520	Mandera	521.1	500	
25 Wajir	530	Wajir	532.4	1,540	
26 Kisi	610	Kisii	615.0	21,080	*1
27 Kisumu	620	Kisumu	622.2	33,480	
28 Siaya	630	Siaya	634.1	960	
29 Homa Bay	640	South Nyanza	641.1	9,180	
30 Kajiado	710	Kajiado	713.1	9,240	
31 Kericho	720	Kericho	725.5	9,360	*1
32 Nanyuki	730	Laikipia	731.5	15,640	*1
33 Naivasha	740	Nakuru	744.1	7,200	*1
34 Nakuru	740	Nakuru	749.0	51,800	*1
35 Narok	750	Narok	752.1	6,440	
36 Kitale	760	Trans Nzoia	762.3	25,200	*1
37 Eldoret	770	Uasin Gishu	772.5	34,320	*1
38 Kabarnet	810	Baringo	812.5	1,280	
39 Iten	820	Elgeyo-Marakwet	822.4	2,640	
40 Kapsabet+Baraton	830	Nandi	832.2	13,120	
41 Maralal	840	Samburu	841.4	5,600	
42 Lodwar	850	Turukana	853.5	1,760	
43 Kapenguria/Makutano	860	West Pokot	861.1	2,800	
44 Bungoma	910	Bungoma	912.4	14,960	*1
45 Webuye	910	Bungoma	914.2	1,840	*1
46 Busia	920	Busia	921.5	900	
47 Kakamega	930	Kakamega	935.4	16,560	*1
Total cost				873,990	

Notes: Town area was obtained from the maps of 1: 50,000 scale.
 *1 Projected population in 2010 is more than 100,000 people.

Construction cost of drainage works above was estimated based on the following assumption.

Civil works per km² of drainage area:

Improvement and new construction of drainage channels without concrete/masonry slope protection works.

Type I :	bottom width=4 m, height= 2 m, slope 1:2.0	200 m long each
Type II :	bottom width=10 m, height= 2 m, slope 1:2.0	200 m long each

Closed channel (culvert):	3m wide and 2.5 m high	100 m long
Lateral (concrete pipe):	0.6 m dia.	1,000 m long

Unit Price:	Area = 1 km ² class	US \$ 8,000,000
	Area = 5 km ² class	US \$ 6,000,000
	Area = 10 km ² class	US \$ 4,000,000

Table 6.7.1 Total Cost for Urban Water Supply (1/3)

Code	Location	Urban Name	Population in 2010 (nos)	Demand in 2010 (m3/day)	Present Coverage (%)	Incremental Cost (US\$ 1,000)
110.0	Nairobi	Nairobi	3,465,400	802,168	54	865,133
211.1	Kiambaa	Karuri	46,400	7,557	0	8,964
211.4	Kiambu Municipality	Kiambu	16,600	4,803	35	7,385
212.1	Ngenda	Gatundu & Ngenda	2,000	460	100	314
213.1	Limuru	Limuru	4,600	2,337	22	14,167
214.1	Ruiru	Ruiru	40,900	7,456	15	9,678
214.4	Thika Municipality	Thika	217,500	39,416	100	21,339
215.1	Githunguri	Githunguri	14,100	2,444	23	4,968
216.6	Kikuyu	Kikuyu	22,500	10,567	28	6,616
221.1	Tebere	Wanguru	1,500	490	100	1,179
222.2	Kiine	Sagana	11,100	1,950	57	3,562
222.3	Inoi	Kerugoya	34,100	5,443	78	8,350
223.2	Kabare	Kutus	23,500	3,575	98	4,891
231.4	Muruka	Kandara	1,800	272	100	482
232.3	Nginda	Maragua	91,200	13,813	1	15,066
233.4	Iyego	Kangema	3,900	590	100	1,208
234.3	Mbiri	Murang'a	70,100	12,449	78	11,378
235.1	Makuyu	Makuyu	16,500	2,499	0	4,792
241.3	Oi Kalou	Oi Kalou	37,900	6,662	70	10,714
254.2	Konyu	Karatina	20,700	3,606	100	3,883
256.1	Karima	Othaya	18,400	2,796	36	5,000
257.0	Nyeri Municipality	Nyeri	370,700	59,718	38	50,344
311.2	Mariakani	Mariakani	33,100	10,502	16	4,621
313.2	Tezo	Kilifi	54,500	8,994	100	9,645
314.3	Gede	Watamu	9,200	1,389	0	5,151
314.4	Malindi Town	Malindi	159,800	25,408	100	29,252
314.6	Magarini	Mambrui	14,400	2,092	0	4,479
321.1	Shimba North	Kwale	15,200	2,325	86	4,755
323.1	Kinango South	Kinango	5,800	885	97	4,773
324.1	Msambweni	Msambweni	34,500	5,427	46	45,479
324.5	Lungalunga	Lungalunga	8,200	1,404	68	2,355
331.0	Witu	Witu	12,500	1,987	30	5,403
333.2	Lamu Town	Lamu	34,000	6,317	30	37,534
340.0	Mombasa	Mombasa	904,400	202,823	68	343,462
351.1	Taveta	Taveta	28,900	5,449	16	7,219
352.4	Voi	Voi	36,000	6,565	56	7,669
353.2	Werugha	Wundanyi	8,000	1,237	100	935
362.3	Bura	Bura & Madogo	2,800	450	81	947
363.3	Zabaki	Hola	34,800	5,862	36	6,850
364.1	Bilisa	Garsen	11,700	1,882	30	2,989
411.8	Kangaari South	Runyenjes	6,100	1,228	33	2,337
412.1	Nthawa	Siakago	800	120	100	0
413.7	Embu Municipality	Embu	72,900	11,899	100	8,849
421.1	Central	Isiolo	88,100	18,914	41	152,573
421.2	Oldonyonyiro	Oi Doinyo Ng'iro	17,600	3,681	0	8,323
422.1	Garbatula	Garbatula	7,600	1,590	44	40,389
423.1	Merti	Merti	22,700	4,757	7	5,460
431.4	Changwithya	Kitui	40,800	6,759	76	9,415
433.2	Mutomo	Mutomo	1,600	242	100	0
434.4	Mwingi	Mwingi	32,000	4,888	5	16,141
441.1	Muvuti	Machakos	356,400	56,631	19	78,112
441.2	Mitaboni	Mitaboni	114,000	17,296	0	20,293
442.3	Settlement Area	Athi River	98,200	17,649	100	13,139
444.3	Kiteta	Uaanj/Tawa	700	105	11	1,113

Table 6.7.1 Total Cost for Urban Water Supply (2/3)

Code	Location	Urban Name	Population in 2010 (nos)	Demand in 2010 (m3/day)	Present Coverage (%)	Incremental Cost (US\$ 1,000)
445.1	Kangundo	Kangundo	43,900	6,812	4	19,537
445.2	Matungulu	Tala	6,400	1,951	7	8,437
447.4	Kilungu	Nunguni	1,000	151	73	1,498
448.1	Makueni	Wote	9,000	1,629	36	3,263
448.3	Nzau	Emali	800	121	0	1,691
449.4	Mtito Andei	Mtito Andei&Kibwezi	13,500	2,049	0	19,537
451.1	North Horr	North Horr	6,300	1,244	7	22,017
452.2	Kargi	Kargi	16,600	3,290	7	66,779
453.1	Korr	Korr	17,200	3,411	39	56,810
454.1	Mountain	Marsabit	42,700	9,078	14	177,736
455.2	Sololo	Sololo	14,300	2,832	3	63,277
456.1	Moyale	Moyale	26,200	5,956	30	68,275
461.4	Ntima	Meru	319,900	53,093	23	43,544
463.1	Nkuene	Nkubu	20,300	3,102	41	4,639
464.1	Chogoria	Chogoria	2,900	443	0	1,716
464.3	Karingani	Chuka	12,400	1,894	68	4,158
467.2	Maua	Maua	12,400	1,894	29	3,827
513.1	Madogashe	Mudo Gashe	6,700	1,141	19	19,616
515.2	Ijara	Ijara	3,200	545	0	10,682
515.3	Kotile	Kotile	3,200	545	0	15,628
515.4	Masalani	Masalani	3,200	545	35	2,370
519.1	Sankuri	Garissa	115,300	20,030	100	12,918
521.1	Mandera	Mandera	18,100	3,602	100	3,136
523.1	Elwak	Elwak	24,400	4,242	6	75,481
524.2	Rhamu	Rhamu	10,200	1,772	69	2,866
532.4	Wajir Township	Wajir	75,500	12,493	1	172,266
536.2	Buna	Buna	18,700	3,094	0	94,774
537.2	Bute	Bute	6,100	1,008	3	18,378
611.2	Eranga	Manga	2,100	320	22	3,545
611.5	East Kitutu	Keroka	6,100	1,537	24	4,958
612.2	East Mugirango	Nyamira + Kibirigo	32,400	5,090	24	11,590
615.0	Kisii Municipality	Kisii	138,500	24,020	45	23,590
617.1	Majoge Chache	Ogembo	2,700	412	0	1,734
622.1	West Kisumu	Maseno	50,600	19,934	32	15,551
622.3	East Kisumu	Kisumu & + Kiboswa	578,700	89,344	60	81,004
623.2	South East Kano	Ahero	26,900	4,864	0	5,869
625.2	Muhoroni	Muhoroni	26,700	4,720	7	7,633
632.4	West Sakwa	Bondo	8,600	1,771	23	4,172
633.2	East Gem	Yala	6,500	1,751	31	2,526
634.1	East Alego	Siaya	57,200	9,778	37	15,975
635.4	North Agenya	Ukwala	2,700	411	31	1,914
641.1	Kanyada West	Homa Bay	73,900	12,741	30	12,521
644.3	Suna East	Migori	24,100	4,253	10	5,446
646.3	Bukira East	Kehancha + Tarang'anya	9,800	1,481	2	4,757
646.8	Bugembe West	Nyabikaye	9,300	1,405	0	27,046
647.4	Central Kasipul	Oyugis	9,800	1,629	32	4,938
648.1	Central Karachuonyo	Kendu Bay	8,700	1,974	24	2,970
649.4	South Sakwa	Awendo/Sare	11,000	2,877	0	5,263
711.1	Odoimongi	Oloitokitok	24,500	4,034	22	7,032
712.1	Ngong	Ngong	81,800	13,474	13	14,608
713.1	Ildamat	Kajiado	34,100	5,617	15	19,742
713.5	Namanga	Namanga	27,300	4,496	13	5,666
714.1	Magadi	Magadi	16,000	2,781	76	10,688
723.1	Kepletudo	Sotik	16,600	3,640	12	4,481

Table 6.7.1 Total Cost for Urban Water Supply (3/3)

Code	Location	Urban Name	Population in 2010 (nos)	Demand in 2010 (m3/day)	Present Coverage (%)	Incremental Cost (US\$ 1,000)
725.5	Kericho Township	Kericho	145,000	27,497	35	24,233
726.1	Kipkelion	Kipkelion	7,800	1,210	35	2,083
727.1	Londiani	Londiani	11,300	1,816	24	4,086
731.5	Nanyuki	Nanyuki	114,900	20,546	61	18,615
733.4	Rumuruti	Rumuruti	8,200	1,651	19	4,893
733.9	Nyahururu Township	Nyahururu	60,000	11,055	94	20,112
743.2	Gilgil	Gilgil	73,800	12,065	33	11,347
744.1	Naivasha	Naivasha	194,500	31,924	34	38,519
746.1	Njoro	Njoro	46,000	7,608	30	26,104
747.3	Elburgon	Elburgon	62,700	10,239	21	24,732
747.5	Molo South	Molo	55,100	9,259	22	19,937
749.0	Nakuru Municipality	Nakuru	869,900	151,718	57	189,656
752.1	Lower Melili	Narok	85,700	14,516	50	17,751
752.5	Keekonyoike	Nairagie Ngare	2,500	413	61	1,774
754.4	Uasin Gishu East	Kilgoris	16,200	2,686	24	4,282
755.1	Siria East	Lolkorian	8,400	1,391	25	3,734
762.3	Kitale	Kitale	249,200	40,986	60	34,757
762.4	Kiminini	Kiminini/Saboti+Spr.Kita	4,200	642	0	3,963
763.5	Endebess	Endebess/Kwanza	6,700	1,029	0	2,412
771.2	Moi's Bridge	Moi's Bridge	10,100	1,577	6	2,934
772.4	Turbo West	Turbo	14,000	2,185	23	5,480
772.5	Eldoret Municipality	Eldoret	486,800	84,415	80	122,112
774.6	Olare	Burnt Forest	7,200	1,124	20	2,091
812.5	Kabarnet Mosop	Kabarnet	34,700	5,558	89	7,324
814.3	Maji Mazuri	Maji Mazuri	19,200	2,991	12	5,180
814.5	Eldama Ravine	Eldama Ravine	20,700	3,372	58	9,945
815.1	Lembus Soi	Mogotio	10,700	1,662	100	2,421
816.2	Marigat	Marigat	8,600	1,340	38	2,549
822.4	Kiptuilong	Iten+Tambach	19,700	3,194	58	11,782
831.3	Chemelil	Nandi Hills	4,200	2,467	23	4,008
832.2	Chemundu	Kapsabet+Baraton	56,300	9,002	39	11,817
841.4	Maralal	Maralal	74,800	13,177	20	16,040
842.4	Wamba	Wamba	15,600	2,651	17	81,960
843.6	Elbarta	Baragoi	13,500	2,294	10	123,684
853.5	Lodwar	Lodwar	33,400	7,881	66	132,580
861.1	Kapenguria	Kapenguria/Makutano	48,200	7,538	10	8,920
911.4	Malakisi	Mawalie + Malakisi	10,700	2,084	0	3,319
912.4	Musikoma	Bungoma	142,700	23,561	49	26,771
913.1	Kimilili	Kimilili	31,500	4,795	16	7,318
914.2	Webuye	Webuye	128,700	19,991	31	20,038
916.1	Cheptais	Chaptais	10,000	1,675	0	2,693
921.5	South Teso	Busia	70,200	11,113	95	14,087
922.2	Central Bukhayo	Nambale	8,100	1,233	50	2,219
931.3	West Bunyore	Luanda	12,600	2,478	100	1,759
932.5	Central Maragoli	Vihiga+Majengo	14,400	2,332	15	5,086
933.1	Shamakhokho	Kaimosi	1,300	498	100	0
934.3	West Isukha	Khayega	1,400	513	0	1,774
935.4	Kakamega Municipality	Kakamega	187,500	30,259	35	28,202
939.2	Central Marama	Butere	7,400	1,121	46	2,196
93A.4	Central Wanga	Mumias	75,900	11,814	23	13,496
TOTAL			12,537,900	2,414,293	53	4,371,922

Table 6.7.2 Total Cost of Urban Sewerage Development (1/2)

Code	Urban Name	City Code	Population In 2010 (nos)	Urban Area in 2010 (ha)	Coverage (%)	Sewer Cost (US\$'000)	Demand in 2010 (m ³ /day)	Required Area (ha)	Treatment Cost (US\$'000)	Development Cost (US\$'000)
110.0	Nairobi	U- 1	3,465,400	25,881	50	136,766	520,500	4,445	78,046	214,811
211.1	Karuri	U- 2	46,400	347	25	916	7,027	60	670	1,586
211.4	Kilambu	U- 3	16,600	124	25	328	2,515	21	245	572
212.1	Gatundu+Ngenda	U- 4	2,000	15	25	39	303	3	30	69
213.1	Limuru	U- 5	4,600	34	25	91	696	6	68	159
214.1	Ruiru	U- 6	40,900	305	25	807	6,091	52	583	1,390
214.4	Thika	U- 7	217,500	1,624	50	8,584	32,944	281	5,542	14,126
215.1	Githunguri	U- 8	14,100	105	25	278	2,133	18	208	486
216.6	Kikuyu	U- 9	22,500	168	25	444	3,408	29	330	774
221.1	Wanguru	U- 10	1,500	11	25	30	226	2	22	52
222.2	Sugana	U- 11	11,100	83	25	219	1,686	14	165	384
222.3	Kerugoya	U- 12	34,100	255	25	673	5,179	44	498	1,171
223.2	Kutus	U- 13	23,500	176	25	464	3,567	30	346	809
231.4	Kandara	U- 14	1,800	13	25	36	272	2	27	62
232.3	Maragua	U- 15	91,200	681	25	1,800	13,813	118	1,277	3,076
233.4	Kangema	U- 16	3,900	29	25	77	590	5	58	135
234.3	Murang'a	U- 17	70,100	524	25	1,383	10,616	91	996	2,379
235.1	Makuyu	U- 18	16,500	123	25	326	2,499	21	243	569
241.3	Oi Kalou	U- 19	37,900	283	25	748	5,898	50	565	1,313
254.2	Karatina	U- 20	20,700	155	25	408	3,146	27	305	714
256.1	Othaya	U- 21	18,400	137	25	363	2,796	24	272	635
257.0	Nyeri	U- 22	370,700	2,768	50	14,630	56,356	481	9,111	23,742
311.2	Mariakani	U- 23	33,100	247	25	653	5,005	43	482	1,135
313.2	Kilifi	U- 24	54,500	407	25	1,075	8,239	70	781	1,857
314.3	Watamu	U- 25	9,200	69	25	182	1,389	12	136	317
314.4	Malindi	U- 26	159,800	1,193	50	6,307	24,162	206	4,249	10,536
314.6	Mambur	U- 135	14,400	108	25	284	2,092	18	204	488
321.1	Kwale	U- 27	15,200	114	25	300	2,325	20	226	526
323.1	Kinango	U- 28	5,800	43	25	114	885	8	87	201
324.1	Msamweni	U- 29	34,500	258	25	681	5,275	45	507	1,188
324.5	Lungu	U- 136	8,200	61	25	162	1,252	11	123	284
331.0	Witu	U- 30	12,500	93	25	247	1,987	17	194	441
333.2	Lamu	U- 31	34,000	254	25	671	5,407	46	519	1,190
340.0	Mombasa	U- 32	904,400	6,754	50	35,693	135,989	1,161	21,712	57,406
351.1	Taveta	U- 137	28,900	216	25	570	4,470	38	431	1,002
352.4	Voi	U- 33	36,000	269	25	710	5,569	48	535	1,245
353.2	Wundanyi	U- 34	8,000	60	25	158	1,237	11	121	279
362.3	Bura&Madogo	U- 35	2,800	21	25	55	450	4	44	99
363.3	Hola	U- 36	34,800	260	25	687	5,598	48	537	1,224
364.1	Garsen	U- 37	11,700	87	25	231	1,882	16	184	415
411.8	Runyenjes	U- 38	6,100	46	25	120	925	8	91	211
412.1	Siakago	U- 39	800	6	25	16	120	1	12	28
413.7	Embu	U- 40	72,900	544	25	1,439	11,064	94	1,036	2,474
421.1	Isiolo	U- 41	88,100	658	25	1,738	18,456	158	1,669	3,407
421.2	Oi Doi Nyong Ng'ito	U- 42	17,600	131	25	347	2,681	31	356	704
422.1	Garbatula	U- 138	7,600	57	25	150	1,590	14	155	305
423.1	Merit	U- 139	22,700	170	25	448	4,757	41	458	906
431.4	Kitui	U- 43	40,800	305	25	805	6,232	53	596	1,402
433.2	Mutomo	U- 44	1,600	12	25	32	242	2	24	55
434.4	Mwingi	U- 45	32,000	239	25	631	4,888	42	471	1,102
441.1	Machakos	U- 46	356,400	2,662	50	14,066	54,076	462	8,746	22,812
441.2	Mitaboni & Machakos	U- 47	114,000	851	50	4,499	17,296	148	3,145	7,644
442.3	Athi River	U- 48	98,200	733	25	1,938	14,901	127	1,370	3,308
444.3	Uasin/Tawa	U- 49	700	5	25	14	105	1	10	24
445.1	Kangundo	U- 50	43,900	328	25	866	6,660	57	636	1,502
445.2	Tala	U- 140	6,400	48	25	126	969	8	95	221
447.4	Nunguni	U- 51	1,000	7	25	20	151	1	15	35
448.1	Wote	U- 141	9,000	67	25	178	1,365	12	134	311
448.3	Emali	U- 52	800	6	25	16	121	1	12	28
449.4	Mitito Andei&Kibwezi	U- 53	13,500	101	25	266	2,049	17	200	466
451.1	North Horr	U- 142	6,300	47	25	124	1,244	11	122	246
452.2	Kargi	U- 54	16,600	124	25	328	3,290	28	319	647
453.1	Korr	U- 143	17,200	128	25	339	3,411	29	331	670
454.1	Maraabit	U- 55	42,700	319	25	843	8,471	72	803	1,645
455.2	Sololo	U- 56	14,300	107	25	282	2,832	24	275	557
456.1	Moyale	U- 57	26,200	196	25	517	5,195	44	500	1,017
461.4	Meru	U- 58	319,900	2,389	50	12,625	48,899	418	7,915	20,540
463.1	Nkubu	U- 59	20,300	152	25	401	3,102	26	301	702
464.1	Chogoria	U- 60	2,900	22	25	57	443	4	44	101
464.3	Chuka	U- 61	12,400	93	25	245	1,894	16	185	430
467.2	Maua	U- 62	12,400	93	25	245	1,894	16	185	430
513.1	Mudo Gashe	U- 63	6,700	50	25	132	1,141	10	112	244
515.2	Ijara	U- 64	3,200	24	25	63	545	5	54	117
515.3	Kotile	U- 65	3,200	24	25	63	545	5	54	117
515.4	Masalani	U- 66	3,200	24	25	63	545	5	54	117
519.1	Gerissa	U- 67	115,300	861	50	4,550	19,654	168	3,533	8,084
521.1	Mandera	U- 68	18,100	135	25	357	3,147	27	305	663
523.1	El Wak	U- 69	24,400	182	25	481	4,242	36	410	891
524.2	Rhamu	U- 70	10,200	76	25	201	1,772	15	173	374

Table 6.7.2 Total Cost of Urban Sewerage Development (2/2)

Code	Urban Name	City Code	Population in 2010 (nos)	Urban Area in 2010 (ha)	Coverage (%)	Sewer Cost (US\$'000)	Demand in 2010 (m3/day)	Required Area (ha)	Treatment Cost (US\$'000)	Development Cost (US\$'000)
532.4	Wajir	U- 71	75,500	564	25	1,490	12,493	107	1,162	2,652
536.2	Buna	U- 72	18,700	140	25	369	3,094	26	300	669
537.2	Huto	U- 73	6,100	46	25	120	1,008	9	99	219
611.2	Manga	U- 74	2,100	16	25	41	320	3	31	73
611.5	Keroka	U- 75	6,100	46	25	120	930	8	91	212
612.2	Nyamira+Kibirigo	U- 144	32,400	242	25	639	4,942	42	476	1,115
615.0	Kilili	U- 76	138,500	1,034	50	5,466	21,131	180	3,772	9,238
617.1	Ogembo	U- 77	2,700	20	25	53	412	4	41	94
622.1	Maseno	U- 78	50,600	378	25	998	7,798	67	741	1,740
622.3	Klaumu + Kiboswa	U- 79	578,700	4,322	50	22,839	89,192	762	14,346	37,185
623.2	Ahero	U- 80	26,900	201	25	531	4,145	35	401	931
625.2	Muhoroni	U- 81	26,700	199	25	527	4,113	35	397	924
632.4	Bondo	U- 145	8,600	64	25	170	1,316	11	129	298
633.2	Yala	U- 82	6,500	49	25	128	993	8	97	226
634.1	Siaya	U- 83	57,200	427	25	1,129	8,748	75	828	1,956
635.4	Ukwala	U- 84	2,700	20	25	53	411	4	40	94
641.1	Homa Bay	U- 85	73,900	552	25	1,458	11,180	95	1,046	2,504
644.3	Migori	U- 86	24,100	180	25	476	3,646	31	333	829
646.3	Kehancha+Taranganya	U- 146	9,800	73	25	193	1,481	13	145	338
646.8	Nyabikayo	U- 147	9,300	69	25	184	1,403	12	137	321
647.4	Oyugis	U- 148	9,800	73	25	193	1,481	13	145	338
648.1	Kendu Bay	U- 87	8,700	65	25	172	1,316	11	129	300
649.4	Awendo	U- 149	11,000	82	25	217	1,664	14	163	380
711.1	Oloitokitok	U- 88	24,500	183	25	483	4,034	34	390	873
712.1	Ngong	U- 89	81,800	611	25	1,614	13,474	115	1,247	2,861
713.1	Kajiado	U- 90	34,100	255	25	673	5,617	48	539	1,212
713.5	Namanga	U- 91	27,300	204	25	539	4,496	38	434	972
714.1	Magadi	U- 92	16,000	119	25	316	2,633	22	256	572
723.1	Sotik	U- 93	16,600	124	25	328	2,578	22	251	579
725.5	Kericho	U- 94	145,000	1,083	50	5,723	22,536	192	3,995	9,718
726.1	Kipkelion	U- 95	7,800	58	25	154	1,210	10	118	272
727.1	Londiani	U- 96	11,300	84	25	223	1,755	15	171	394
731.5	Nanyuki	U- 97	114,900	858	50	4,535	18,892	161	3,409	7,943
733.4	Rumuruti	U- 150	8,200	61	25	162	1,348	12	132	294
733.9	Nyahururu	U- 98	60,000	448	25	1,184	9,866	84	929	2,113
743.2	Gügil	U- 99	73,800	551	25	1,456	11,726	100	1,094	2,551
744.1	Naivasha	U- 100	194,500	1,453	50	7,676	30,906	264	5,254	12,930
746.1	Njoro	U- 101	46,000	344	25	908	7,309	62	696	1,604
747.3	Elburgon	U- 102	62,700	468	25	1,237	9,961	85	937	2,175
747.5	Molo	U- 103	55,100	412	25	1,087	8,755	75	828	1,916
749.0	Nakuru	U- 104	869,900	6,497	50	34,331	132,328	1,130	21,140	55,472
752.1	Narok	U- 105	85,700	640	25	1,691	14,213	121	1,311	3,002
752.5	Nalragie Ngaro	U- 106	2,500	19	25	49	413	4	41	90
754.4	Kilgoris	U- 151	16,200	121	25	320	2,686	23	261	581
755.1	Loikorian	U- 152	8,400	63	25	166	1,391	12	136	302
762.3	Kitale	U- 107	249,200	1,861	50	9,835	38,132	326	6,243	16,078
762.4	Kimini/Saboti+Spr.Kitale	U- 108	4,200	31	25	83	642	5	63	146
763.5	Endebesa/Kwanza	U- 109	6,700	50	25	132	1,026	9	101	233
771.2	Moi's Bridge	U- 153	10,100	75	25	199	1,577	13	154	353
772.4	Turbo	U- 154	14,000	105	25	276	2,185	19	213	489
772.5	Eldoret	U- 110	486,800	3,636	50	19,212	76,040	649	12,256	31,468
774.6	Burnt Forest	U- 111	7,200	54	25	142	1,124	10	110	252
812.5	Kabarnet	U- 112	34,700	259	25	685	5,390	46	518	1,203
814.3	Maji Mazuri	U- 113	19,200	143	25	379	2,983	25	290	669
814.5	Eldama Ravine	U- 114	20,700	155	25	408	3,215	27	312	720
815.1	Mogotio	U- 115	10,700	80	25	211	1,662	14	162	374
816.2	Marigat	U- 155	8,600	64	25	170	1,337	11	131	300
822.4	Iten+Tambach	U- 116	19,700	147	25	389	3,189	27	309	698
831.3	Nandi Hills	U- 117	4,200	31	25	83	647	6	64	146
832.2	Kapsabet+Baraton	U- 118	56,300	420	25	1,111	8,696	74	823	1,934
841.4	Maralal	U- 119	74,800	559	25	1,476	12,723	109	1,182	2,658
842.4	Wamba	U- 120	15,600	117	25	308	2,651	23	258	566
843.6	Baragol	U- 121	13,500	101	25	266	2,294	20	223	490
853.5	Lodwar	U- 122	33,400	249	25	659	7,123	61	679	1,338
861.1	Kapenguria/Makutano	U- 123	48,200	360	25	951	7,386	63	703	1,654
911.4	Mwalio + Malakisi	U- 156	10,700	80	25	211	1,629	14	159	370
912.4	Burgoma	U- 124	142,700	1,066	50	5,632	21,730	186	3,867	9,499
913.1	Kimilili	U- 125	31,500	235	25	622	4,795	41	462	1,084
914.2	Webuye	U- 126	128,700	961	50	5,079	19,597	167	3,524	8,603
916.1	Chaptais	U- 157	10,000	75	25	197	1,523	13	149	346
921.5	Busia	U- 127	70,200	524	25	1,385	10,692	91	1,003	2,388
922.2	Nambale	U- 158	8,100	60	25	160	1,233	11	121	281
931.3	Luanda	U- 128	12,600	94	25	249	1,911	16	187	435
932.5	Vihiga+Majengo	U- 129	14,400	108	25	284	2,184	19	213	497
933.1	Kaimosi	U- 130	1,300	10	25	26	195	2	19	45
934.3	Khayega	U- 131	1,400	10	25	28	210	2	21	48
935.4	Kakamega	U- 132	187,500	1,400	50	7,400	28,439	243	4,896	12,295
939.2	Butero	U- 133	7,400	55	25	146	1,121	10	110	256
93A.4	Mumias	U- 134	75,900	567	25	1,498	11,511	98	1,075	2,573
Total			12,537,900	93,636		430,134	1,935,524	16,527	274,820	704,955

Table 6.7.3 Construction Cost for Rural Water Supply System

Code	District Name	District Area (km ²)	Effect. Area (km ²)	Demand in 2010 (m ³ /day)	Water Source (m ³ /day)		Construction Cost (1000 US\$)		Total
					Surface water & Water harvesting	Groundwater	Supply Cost	Exploitation Cost	
110	Nairobi	719	-	0	0	0	0	0	0
210	Kisumu	2,549	2,012	60,567	57,821	2,809	65,686	14,774	80,460
220	Kirinyaga	1,510	1,042	25,875	25,026	834	28,081	3,823	31,904
230	Murang'a	2,555	2,091	57,134	55,601	1,505	62,064	7,046	69,110
240	Nyandarua	3,295	2,352	25,614	18,404	7,172	26,685	36,261	62,946
250	Nyeri	3,324	1,497	36,041	35,788	221	39,262	1,500	40,762
310	Kilifi	12,546	9,697	23,681	13,345	10,080	24,058	70,210	94,268
320	Kwale	8,193	7,300	17,516	7,640	9,813	17,368	58,408	75,776
330	Lamu	6,267	3,469	2,007	558	1,429	1,928	8,079	10,007
340	Mombasa	198	-	0	0	0	0	0	0
350	Taita Taveta	17,324	5,381	6,480	3,658	2,791	6,563	17,372	23,935
360	Tana River	39,311	28,545	4,551	1,677	2,824	4,432	16,213	20,645
410	Embu	2,789	2,345	22,094	16,263	5,788	23,076	25,411	48,487
420	Isiolo	25,375	21,934	1,809	564	1,218	1,740	7,515	9,255
430	Kitui	30,580	19,446	24,129	7,757	16,288	23,453	102,677	126,130
440	Machakos	14,209	12,066	54,205	23,791	30,278	53,820	155,589	209,409
450	Marsabit	70,598	61,609	3,587	781	2,772	3,406	18,582	21,988
460	Meru	9,533	6,680	62,124	40,781	21,257	64,062	122,818	186,880
510	Garissa	43,721	38,828	3,080	419	2,617	2,869	14,364	17,233
520	Mandera	26,181	25,700	3,447	645	2,765	3,251	15,324	18,575
530	Wajir	56,744	55,382	3,109	421	2,643	2,895	15,192	18,087
610	Kisii	2,170	2,198	86,050	73,079	12,919	91,637	28,897	120,534
620	Kisumu	2,068	1,890	30,768	18,146	12,588	31,386	42,912	74,298
630	Siaya	2,418	2,383	43,960	22,141	21,749	44,173	56,960	101,133
640	South Nyanza	5,750	5,203	62,728	34,071	28,517	63,418	114,688	178,106
710	Kajiado	21,960	17,919	11,888	6,015	5,813	11,915	39,102	51,017
720	Kericho	4,995	3,785	68,652	64,366	4,246	74,151	12,782	86,933
730	Laikipia	9,734	8,225	9,536	4,131	5,348	9,432	32,887	42,319
740	Nakuru	7,480	4,429	48,574	34,127	14,384	50,478	93,333	143,811
750	Narok	18,025	13,837	31,929	18,526	13,322	32,476	69,660	102,136
760	Trans Nzoia	2,509	1,883	21,807	20,308	1,471	23,519	3,352	26,871
770	Uasin Gishu	3,723	2,958	19,743	19,489	230	21,483	949	22,432
810	Baringo	10,784	8,629	12,982	7,389	5,495	13,122	32,094	45,216
820	Elgey Marakwet	2,843	1,263	14,036	8,761	5,226	14,372	17,906	32,278
830	Nandi	2,773	2,199	34,794	32,590	2,160	37,556	4,099	41,655
840	Samburu	21,140	15,677	4,025	1,200	2,781	3,872	17,928	21,800
850	Turkana	67,549	62,193	6,112	1,233	4,827	5,790	28,739	34,529
860	Wst Pokot	9,157	8,367	10,275	4,241	5,978	10,131	27,947	38,078
910	Bungoma	2,981	2,496	58,099	49,467	8,595	61,893	16,827	78,720
920	Busia	1,725	1,433	36,967	21,650	15,275	37,682	39,863	77,545
930	Kakamega	3,604	3,122	111,696	100,978	10,644	119,990	22,116	142,106
Total		580,909	477,465	1,161,771	853,048	306,672	1,213,176	1,414,199	2,627,375

Note: Effective area is area excluding parks, forest, etc.

Cost estimate was made on Location basis.

Table 6.7.4 Source Development Plan for Livestock Water Supply (1/4)

Code	District	Source Development Plan							Total
		Surface Water	Borehole	Shallow Well	Small Dam	Subsurface Dam	Sand Dam	Existing Pipeline	
	Nairobi Province								
110	Nairobi								
	- Quantity (m3/d)	0	0	0	0	0	0	0	0
	- No. of Facilities	0	0	0	0	0	0	0	0
	- Cost (mill.US\$)	0	0	0	0	0	0	0	0
	(mill.K£)	0	0	0	0	0	0	0	0
	Central Province								
210	Kiambu								
	- Quantity (m3/d)	5,949	286	8	333	0	0	21	6,597
	- No. of Facilities	0	13	2	28	0	0	0	43
	- Cost (mill.US\$)	0	1.07	0.01	0.3	0	0	0	1.37
	(mill.K£)	0	1.35	0.01	0.37	0	0	0	1.73
220	Kirinyaga								
	- Quantity (m3/d)	3,779	58	14	154	0	0	0	4,005
	- No. of Facilities	0	2	3	12	0	0	0	17
	- Cost (mill.US\$)	0	0.22	0.01	0.08	0	0	0	0.32
	(mill.K£)	0	0.28	0.02	0.11	0	0	0	0.4
230	Muranga								
	- Quantity (m3/d)	5,734	19	79	305	0	0	0	6,137
	- No. of Facilities	0	1	16	23	0	0	0	40
	- Cost (mill.US\$)	0	0.07	0.08	0.11	0	0	0	0.26
	(mill.K£)	0	0.09	0.1	0.14	0	0	0	0.33
240	Nyandarua								
	- Quantity (m3/d)	10,186	1,855	49	881	0	0	51	13,022
	- No. of Facilities	0	71	7	21	0	0	0	99
	- Cost (mill.US\$)	0	7.43	0.02	0.86	0	0	0	8.31
	(mill.K£)	0	9.36	0.03	1.09	0	0	0	10.48
250	Nyeri								
	- Quantity (m3/d)	4,969	0	0	200	0	0	0	5,169
	- No. of Facilities	0	0	0	27	0	0	0	27
	- Cost (mill.US\$)	0	0	0	0.11	0	0	0	0.11
	(mill.K£)	0	0	0	0.14	0	0	0	0.14
	Sub-total								
	- Quantity (m3/d)	30,617	2,218	150	1,873	0	0	72	34,930
	- No. of Facilities	0	87	28	111	0	0	0	226
	- Cost (mill.US\$)	0	8.79	0.12	1.46	0	0	0	10.37
	(mill.K£)	0	11.08	0.16	1.85	0	0	0	13.08
	Coast Province								
310	Kilifi								
	- Quantity (m3/d)	237	1,255	2,371	8	8	7	39	3,925
	- No. of Facilities	0	47	482	4	5	5	0	543
	- Cost (mill.US\$)	0	4.39	2.26	0.01	0.02	0.01	0	6.7
	(mill.K£)	0	5.54	2.85	0.01	0.03	0.02	0	8.44
320	Kwale								
	- Quantity (m3/d)	921	2,639	2,529	65	17	49	75	6,295
	- No. of Facilities	0	68	504	12	10	15	0	609
	- Cost (mill.US\$)	0	9.57	2.29	0.08	0.04	0.1	0	12.07
	(mill.K£)	0	12.06	2.88	0.1	0.05	0.12	0	15.23
330	Lamu								
	- Quantity (m3/d)	0	1,203	1,442	0	0	0	0	2,645
	- No. of Facilities	0	32	293	0	0	0	0	325
	- Cost (mill.US\$)	0	4.04	1.41	0	0	0	0	5.44
	(mill.K£)	0	5.09	1.77	0	0	0	0	6.86
340	Mombasa								
	- Quantity (m3/d)	0	0	0	0	0	0	0	0
	- No. of Facilities	0	0	0	0	0	0	0	0
	- Cost (mill.US\$)	0	0	0	0	0	0	0	0
	(mill.K£)	0	0	0	0	0	0	0	0
350	Taita Taveta								
	- Quantity (m3/d)	1,876	1,167	1,468	96	22	22	87	4,738
	- No. of Facilities	0	33	295	7	9	9	0	353
	- Cost (mill.US\$)	0	4.06	1.43	0.13	0.06	0.04	0	5.72
	(mill.K£)	0	5.11	1.8	0.17	0.08	0.06	0	7.22
360	Tana River								
	- Quantity (m3/d)	2,100	1,852	3,779	65	47	47	30	7,920
	- No. of Facilities	0	56	649	10	9	9	0	733
	- Cost (mill.US\$)	0	6.64	3.02	0.09	0.13	0.1	0	9.98
	(mill.K£)	0	8.37	3.81	0.11	0.17	0.12	0	12.58
	Sub-total								
	- Quantity (m3/d)	5,134	8,116	11,589	234	94	125	231	25,523
	- No. of Facilities	0	236	2,223	33	33	38	0	2,563
	- Cost (mill.US\$)	0	28.7	10.41	0.31	0.25	0.25	0	39.91
	(mill.K£)	0	36.17	13.11	0.39	0.33	0.32	0	50.33

Table 6.7.4 Source Development Plan for Livestock Water Supply (2/4)

Code	District	Source Development Plan							Total
		Surface Water	Borehole	Shallow Well	Small Dam	Subsurface Dam	Sand Dam	Existing Pipeline	
	Eastern Province								
410	Embu								
	- Quantity (m3/d)	2,176	596	710	102	3	3	12	3,602
	- No. of Facilities	0	20	146	17	3	3	0	189
	- Cost (mill.US\$)	0	2.13	0.7	0.08	0.01	0.01	0	2.92
	(mill.K£)	0	2.68	0.88	0.1	0.01	0.01	0	3.68
420	Isiolo								
	- Quantity (m3/d)	3,736	5,949	7,507	46	113	332	10	17,693
	- No. of Facilities	0	182	1,241	2	14	37	0	1,476
	- Cost (mill.US\$)	0	21.01	6.47	0.07	0.33	0.7	0	28.57
	(mill.K£)	0	26.49	8.15	0.08	0.41	0.89	0	36.03
430	Kitui								
	- Quantity (m3/d)	542	3,111	6,236	74	224	197	84	10,468
	- No. of Facilities	0	103	1,251	6	36	34	0	1,430
	- Cost (mill.US\$)	0	11.46	5.91	0.1	0.64	0.4	0	18.5
	(mill.K£)	0	14.44	7.45	0.12	0.8	0.51	0	23.33
440	Machakos								
	- Quantity (m3/d)	3,927	2,726	5,032	444	95	65	154	12,443
	- No. of Facilities	0	96	994	34	33	28	0	1,185
	- Cost (mill.US\$)	0	9.93	4.69	0.6	0.26	0.13	0	15.61
	(mill.K£)	0	12.52	5.91	0.75	0.33	0.17	0	19.69
450	Marsabit								
	- Quantity (m3/d)	753	14,425	11,587	132	539	711	262	28,409
	- No. of Facilities	0	471	2,128	3	59	77	0	2,738
	- Cost (mill.US\$)	0	57.43	10.48	0.19	1.56	1.51	0	71.17
	(mill.K£)	0	72.42	13.21	0.24	1.97	1.91	0	89.75
460	Meru								
	- Quantity (m3/d)	10,891	5,417	1,622	624	61	13	2	18,630
	- No. of Facilities	0	171	331	39	11	8	0	560
	- Cost (mill.US\$)	0	19.7	1.6	0.71	0.17	0.03	0	22.21
	(mill.K£)	0	24.85	2.02	0.89	0.22	0.03	0	28.01
	Sub-total								
	- Quantity (m3/d)	22,025	32,224	32,694	1,422	1,035	1,321	524	91,245
	- No. of Facilities	0	1,043	6,091	101	156	187	0	7,578
	- Cost (mill.US\$)	0	121.66	29.85	1.75	2.97	2.78	0	158.98
	(mill.K£)	0	153.4	37.62	2.18	3.74	3.52	0	200.49
	North Eastern Province								
510	Garissa								
	- Quantity (m3/d)	150	3,246	6,781	0	79	48	1	10,305
	- No. of Facilities	0	91	1,305	0	13	13	0	1,422
	- Cost (mill.US\$)	0	11.61	6.13	0	0.22	0.1	0	18.06
	(mill.K£)	0	14.63	7.73	0	0.28	0.12	0	22.77
520	Mandera								
	- Quantity (m3/d)	951	2,620	9,342	0	216	400	0	13,529
	- No. of Facilities	0	94	1,875	0	28	45	0	2,042
	- Cost (mill.US\$)	0	9.55	9.26	0	0.62	0.85	0	20.28
	(mill.K£)	0	12.04	11.67	0	0.78	1.07	0	25.57
530	Wajir								
	- Quantity (m3/d)	0	2,138	5,427	0	87	205	0	7,857
	- No. of Facilities	0	98	1,040	0	19	31	0	1,188
	- Cost (mill.US\$)	0	8.99	5.01	0	0.24	0.43	0	14.67
	(mill.K£)	0	11.34	6.32	0	0.31	0.54	0	18.5
	Sub-total								
	- Quantity (m3/d)	1,101	8,004	21,550	0	382	653	1	31,691
	- No. of Facilities	0	283	4,220	0	60	89	0	4,652
	- Cost (mill.US\$)	0	30.15	20.4	0	1.08	1.38	0	53.01
	(mill.K£)	0	38.01	25.72	0	1.37	1.73	0	66.84

Table 6.7.4 Source Development Plan for Livestock Water Supply (3/4)

Code	District	Source Development Plan							Total
		Surface Water	Borehole	Shallow Well	Small Dam	Subsurface Dam	Sand Dam	Existing Pipeline	
	Nyanza Province								
610	Kisii								
	- Quantity (m3/d)	13,430	275	299	563	0	0	0	14,567
	- No. of Facilities	0	10	63	26	0	0	0	99
	- Cost (mill.US\$)	0	1.01	0.29	0.29	0	0	0	1.58
	(mill.K£)	0	1.27	0.37	0.36	0	0	0	2
620	Kisumu								
	- Quantity (m3/d)	6,489	1,377	2,940	287	0	0	0	11,093
	- No. of Facilities	0	41	384	16	0	0	0	441
	- Cost (mill.US\$)	0	5.09	1.83	0.15	0	0	0	7.07
	(mill.K£)	0	6.42	2.3	0.19	0	0	0	8.92
630	Siaya								
	- Quantity (m3/d)	4,776	1,484	3,221	263	0	0	13	9,757
	- No. of Facilities	0	62	623	28	0	0	0	713
	- Cost (mill.US\$)	0	5.55	2.94	0.1	0	0	0	8.59
	(mill.K£)	0	6.99	3.71	0.13	0	0	0	10.83
640	South Nyanza								
	- Quantity (m3/d)	3,025	1,428	2,148	209	8	8	0	6,826
	- No. of Facilities	0	68	366	47	8	8	0	497
	- Cost (mill.US\$)	0	5.38	1.77	0.1	0.02	0.02	0	7.28
	(mill.K£)	0	6.79	2.23	0.13	0.02	0.02	0	9.18
	Sub-total								
	- Quantity (m3/d)	27,720	4,564	8,608	1,322	8	8	13	42,243
	- No. of Facilities	0	181	1,436	117	8	8	0	1,750
	- Cost (mill.US\$)	0	17.03	6.83	0.64	0.02	0.02	0	24.52
	(mill.K£)	0	21.47	8.61	0.81	0.02	0.02	0	30.93
	Rift Valley Province								
710	Kajiado								
	- Quantity (m3/d)	9,193	9,559	7,539	593	160	190	174	27,408
	- No. of Facilities	0	328	1,311	11	25	30	0	1,705
	- Cost (mill.US\$)	0	37.2	6.52	0.8	0.46	0.4	0	45.37
	(mill.K£)	0	46.91	8.22	1.01	0.57	0.5	0	57.21
720	Kericho								
	- Quantity (m3/d)	25,541	281	238	1,148	0	0	0	27,208
	- No. of Facilities	0	10	50	27	0	0	0	87
	- Cost (mill.US\$)	0	1.12	0.22	0.61	0	0	0	1.94
	(mill.K£)	0	1.41	0.27	0.77	0	0	0	2.44
730	Laikipia								
	- Quantity (m3/d)	6,650	9,227	1,816	943	113	91	0	18,840
	- No. of Facilities	0	279	360	20	21	18	0	698
	- Cost (mill.US\$)	0	35.51	1.75	1.22	0.32	0.19	0	38.99
	(mill.K£)	0	44.77	2.21	1.53	0.4	0.24	0	49.16
740	Nakuru								
	- Quantity (m3/d)	19,604	14,484	2,694	1,925	182	117	1,762	40,768
	- No. of Facilities	0	470	277	26	25	22	0	820
	- Cost (mill.US\$)	0	56.82	1.44	1.64	0.52	0.24	0	60.66
	(mill.K£)	0	71.65	1.81	2.07	0.66	0.3	0	76.49
750	Narok								
	- Quantity (m3/d)	25,717	11,730	13,201	1,954	151	139	77	52,969
	- No. of Facilities	0	392	2,326	28	22	21	0	2,789
	- Cost (mill.US\$)	0	44.52	11.27	1.63	0.43	0.29	0	58.14
	(mill.K£)	0	56.14	14.22	2.05	0.54	0.37	0	73.32
760	Trans Nzoia								
	- Quantity (m3/d)	6,529	0	0	268	0	0	0	6,797
	- No. of Facilities	0	0	0	15	0	0	0	15
	- Cost (mill.US\$)	0	0	0	0.17	0	0	0	0.17
	(mill.K£)	0	0	0	0.21	0	0	0	0.21
770	Uasin Gishu								
	- Quantity (m3/d)	11,335	0	0	466	0	0	0	11,801
	- No. of Facilities	0	0	0	22	0	0	0	22
	- Cost (mill.US\$)	0	0	0	0.28	0	0	0	0.28
	(mill.K£)	0	0	0	0.35	0	0	0	0.35

Table 6.7.4 Source Development Plan for Livestock Water Supply (4/4)

Code	District	Source Development Plan							Total
		Surface Water	Borehole	Shallow Well	Small Dam	Subsurface Dam	Sand Dam	Existing Pipeline	
810	Baringo								
	- Quantity (m3/d)	3,932	3,067	1,574	210	30	26	51	8,890
	- No. of Facilities	0	97	172	31	16	12	0	328
	- Cost (mill.US\$)	0	11.11	0.84	0.18	0.08	0.05	0	12.25
	(mill.K£)	0	14.01	1.05	0.23	0.1	0.07	0	15.45
820	Elgey Marakwet								
	- Quantity (m3/d)	9,895	1,730	4,028	455	24	0	207	16,339
	- No. of Facilities	0	63	675	25	3	0	0	766
	- Cost (mill.US\$)	0	6.61	3.46	0.39	0.07	0	0	10.52
	(mill.K£)	0	8.33	4.36	0.49	0.09	0	0	13.27
830	Nandi								
	- Quantity (m3/d)	12,211	0	0	414	0	0	0	12,625
	- No. of Facilities	0	0	0	23	0	0	0	23
	- Cost (mill.US\$)	0	0	0	0.22	0	0	0	0.22
	(mill.K£)	0	0	0	0.28	0	0	0	0.28
840	Samburu								
	- Quantity (m3/d)	909	4,702	6,544	86	112	155	2	12,510
	- No. of Facilities	0	242	1,287	6	21	24	0	1,580
	- Cost (mill.US\$)	0	20.68	5.98	0.12	0.32	0.32	0	27.42
	(mill.K£)	0	26.07	7.54	0.15	0.4	0.41	0	34.57
850	Turkana								
	- Quantity (m3/d)	3,781	22,265	34,948	64	1,157	1,417	0	63,632
	- No. of Facilities	0	796	5,765	2	124	150	0	6,837
	- Cost (mill.US\$)	0	80.87	29.46	0.09	3.35	3.02	0	116.78
	(mill.K£)	0	101.97	37.15	0.11	4.22	3.8	0	147.26
860	West Pokot								
	- Quantity (m3/d)	1,588	692	2,095	75	20	10	0	4,480
	- No. of Facilities	0	38	417	14	10	7	0	486
	- Cost (mill.US\$)	0	2.85	1.88	0.07	0.05	0.02	0	4.87
	(mill.K£)	0	3.6	2.37	0.09	0.07	0.03	0	6.14
	Sub-total								
	- Quantity (m3/d)	136,885	77,737	74,677	8,601	1,949	2,145	2,273	304,267
	- No. of Facilities	0	2,715	12,640	250	267	284	0	16,156
	- Cost (mill.US\$)	0	297.29	62.82	7.42	5.6	4.53	0	377.61
	(mill.K£)	0	374.86	79.2	9.34	7.05	5.72	0	476.15
	Western Province								
910	Bungoma								
	- Quantity (m3/d)	8,921	167	409	425	0	0	0	9,922
	- No. of Facilities	0	9	84	19	0	0	0	112
	- Cost (mill.US\$)	0	0.57	0.4	0.22	0	0	0	1.19
	(mill.K£)	0	0.72	0.5	0.28	0	0	0	1.5
920	Busia								
	- Quantity (m3/d)	3,860	645	1,643	162	5	4	0	6,319
	- No. of Facilities	0	28	308	16	3	2	0	357
	- Cost (mill.US\$)	0	2.5	1.53	0.09	0.01	0.01	0	4.14
	(mill.K£)	0	3.16	1.92	0.11	0.02	0.01	0	5.22
930	Kakamega								
	- Quantity (m3/d)	12,226	0	0	365	0	0	0	12,591
	- No. of Facilities	0	0	0	41	0	0	0	41
	- Cost (mill.US\$)	0	0	0	0.14	0	0	0	0.14
	(mill.K£)	0	0	0	0.17	0	0	0	0.17
	Sub-total								
	- Quantity (m3/d)	25,007	812	2,052	952	5	4	0	28,832
	- No. of Facilities	0	37	392	76	3	2	0	510
	- Cost (mill.US\$)	0	3.07	1.93	0.45	0.01	0.01	0	5.47
	(mill.K£)	0	3.88	2.42	0.56	0.02	0.01	0	6.89
	Total								
	- Quantity (m3/d)	248,489	133,675	151,320	14,404	3,473	4,256	3,114	558,731
	- No. of Facilities	0	4,582	27,030	688	527	608	0	33,435
	- Cost (mill.US\$)	0	506.69	132.36	12.03	9.93	8.97	0	669.87
	(mill.K£)	0	638.87	166.84	15.13	12.53	11.32	0	844.71

Table 6.7.5 Allocation of Dam Costs

(Unit : thousand US\$)

No.	Name of Dam	Construction Cost	Allocation of Dam Cost		
			Hydropower	Irrigation	Water Supply
1	Moiben	14,724			1 13,779 (Eldoret)
					2 945 (Iten)
2	Mukulusi	964			964 (Kakamega)
3	Londiani	54,550			54,550 (Londiani)
4	Kibos	23,836			23,836 (Kisumu)
5	Itare	21,425			1 17,125 (Nakuru)
					2 1,195 (Njoro)
					3 1,633 (El Burgon)
					4 1,472 (Molo)
6	Magwagwa	169,702	169,702	- (Kano Plain)	
7	Bunyonyu	4,284			1 3,958 (Kisii)
					2 270 (Keroka)
					3 56 (Manga)
8	Malewa	47,628			1 10,478 (Naivasha)
					2 31,910 (Gilgil)
					3 5,240 (Nakuru)
9	Upper Narok	13,192			13,192 (Narok)
10	Oldorko	121,620	121,620	- (E.Ngiro)	- (Magadi)
11	Upper Athi	6,519			6,519 (Athi River)
12	Ruiru-A	48,920			48,920 (Nairobi)
13	Kikuyu	8,250			8,250 (Kikuyu)
14	Ndarugu	42,227		8,167 (Kanzalu)	34,060 (Nairobi)
15	Yatta	145,235		145,235 (Kibwezi)	
16	Rare	35,117			35,117 (Malindi)
17	Mwachi	97,013			97,013 (Mombasa)
18	Pemba	1,100			1,100 (Mombasa)
19	Chania-B	113,527			113,527 (Nairobi)
20	Thiba	22,208		22,208 (Mwea)	
21	Mutonga	117,944	117,944		
22	Low Grand Falls	242,260	242,260		
23	Rumuruti	4,310			4,310 (Rumuruti)
24	Nyahururu	2,943			2,943 (Nyahururu)
25	Sondu/Miriu *	5,200	5,200		
26	Chemususu *	20,197			1 16,607 (E.Ravine)
					2 3,590 (Mogotio)
27	Kirandich *	20,000			20,000 (Kabarnet)
28	Kiambaa *	4,708			1 3,006 (Karuri)
					2 1,702 (Kiambu)
TOTAL		1,409,603	656,726	175,610	577,268

Note : 1) Cost is tentatively allocated in proportion to water use quantity.
 2) Whole cost by power in case of hydropower dam scheme.
 3) Marked "*" is committed scheme.

Table 6.8.1 Total Economic Benefit Accruing from Water Supply in Kenya : 2000

1. Domestic Water Annual benefit(*1) in 2000					
	GRDP per Capita (US\$/annum)	Disposable Income *2 (US\$/annum)	Income Ratio (%)	Population Projected (1000)	Economic Benefit (US\$1000)
Urban Schemes	1,012	810	5	7,933	289,012 *3
Rural Schemes	210	168	5	22,779	172,353 *3
Total	417	333	5	30,712	461,365 *3

2. Industrial Water a) Annual benefit in 1986 (Reference: Input-Output Table 1986)					
	Gross Output (KPsill.)	Gross Value Added (KPsill.)	Gross Input (KPsill.)	Expense for Water (KPsill.)	Ratio of Water Exp. to Gross VA (%)
Manufacturing	4,270.9	952.6	3,318.4	13.4	1.40%
Benefit = Maximum affordable value of water					1.50%
Economic benefit from industrial production in 1986 (US\$1000)					16,033 *3
b) Economic benefit from industrial production in 2000 (US\$1000)					27,511 *3
Value added of manufacturing sector in 2000 (K.Pound million)					1,895

3. Municipal (Trade, Catering and Government Services) Water a) Annual benefit in 1986 (Reference : Input-Output Table 1986)					
	Gross Output (KPsill.)	Gross Value Added (KPsill.)	Gross Input (KPsill.)	Expense for Water (KPsill.)	Ratio of Water Exp. to Gross VA (%)
Services	3,279.8	2,127.6	1,152.2	8.4	0.39%
Benefit = Maximum affordable value of water					0.50%
Benefit from municipal activities in 1986 (US\$1000)					11,936 *3
b) Economic benefit from municipal activities in 2000 (US\$1000)					16,532 *3
Value added of service sectors in 2000 (K.Pound million)					3,416

4. Livestock Water a) Annual benefit in 1986 (Reference: Input-Output Table of Japan 1986)					
	Gross Output (JYen.mill.)	Gross Value Added (JYen.mill.)	Gross Input (JYen.mill.)	Expense for Water (JYen.mill.)	Ratio of Water Exp. to Gross VA (%)
Livestock Breeding	507,774	93,770	414,004	2,035	2.17%
Benefit = Maximum affordable value of water					2.00%
b) Economic benefit from livestock production(*4) in 2000 (US\$1000)					12,285 *3
Agricultural production in Kenya in 2000 (K.Pound million)					3,686

Source : A06, A24 and Input-Output Table of Japan in 1986

Remark : *1 Traditional Rule of income ratio (Maximum affordable water value)

*2 Personal disposable income is assumed to be 80% of GDP per capita.

*3 Converted to economic values, i.e., 90% of financial values.

*4 Value Added rate of Livestock is assumed to be 20% of the gross output.

Table 6.8.2 Economic Efficiency of Urban Water Supply Projects (1/3)

Urban Code	Urban Name	Loc. Code	Location Name	NPV*1 (US\$1000)	B/C*1	IRR*2 (%)
U-1	Nairobi	110.0	Nairobi	115304	1.15	11.5%
U-2	Karuri	211.1	Kiambaa	-3071	0.71	5.9%
U-3	Kiambu	211.4	Kiambu Municipality	-4940	0.37	-1.6%
U-4	Gatundu & Ngenda	212.1	Ngenda	-146	0.02	---
U-5	Limuru	213.1	Limuru	-10515	0.10	---
U-6	Ruiru	214.1	Ruiru	-1583	0.81	7.3%
U-7	Thika	214.4	Thika Municipality	5985	1.38	14.4%
U-8	Githunguri	215.1	Githunguri	-2026	0.50	1.8%
U-9	Kikuyu	216.6	Kikuyu	-8531	0.39	-0.2%
U-10	Wanguru	221.1	Tebere	-749	0.14	---
U-11	Sagana	222.2	Kiine	-1909	0.34	-4.2%
U-12	Kerugoya	222.3	Inoi	-4154	0.38	-1.5%
U-13	Kutus	223.2	Kabare	-2367	0.38	-1.5%
U-14	Kandara	231.4	Muruka	-225	0.01	---
U-15	Maragua	232.7	Nginda	-4802	0.63	4.5%
U-16	Kangema	233.4	Iyego	-774	0.11	---
U-17	Murang'a	234.3	Mbiri	-4722	0.49	2.4%
U-18	Makuyu	235.1	Makuyu	-2573	0.35	-2.9%
U-19	Oi Kalou	241.3	Oi Kalou	-5140	0.41	0.7%
U-20	Karatina	254.2	Konyu	-1945	0.27	-4.1%
U-21	Othaya	256.1	Karima	-2328	0.42	-0.7%
U-22	Nyeri	257.0	Nyeri Municipality	-5134	0.87	8.2%
U-23	Mariakani	311.3	Mariakani	698	1.19	12.3%
U-24	Kilifi	313.2	Tezo	-4281	0.39	-1.5%
U-25	Watamu	314.3	Gede	-3544	0.17	---
U-26	Malindi	314.4	Malindi Town	-49411	0.14	---
U-27	Kwale	321.1	Shimba North	-2705	0.30	-7.2%
U-28	Kinango	323.1	Kinango South	-3603	0.09	---
U-29	Msambweni	324.1	Msambweni	-33024	0.09	---
U-30	Witu	331.0	Witu	-3042	0.31	-9.2%
U-31	Lamu	333.2	Lamu Town	-26864	0.13	---
U-32	Mombasa	340.0	Mombasa	-169313	0.56	3.8%
U-33	Voi	352.4	Voi	-2228	0.65	5.0%
U-34	Wundanyi	353.2	Werugha	-417	0.06	---
U-35	Bura & Madogo	362.3	Bura	-672	0.16	---
U-36	Hola	363.3	Zabaki	-3542	0.36	-2.9%
U-37	Garsen	364.1	Bilisa	-1814	0.27	---
U-38	Runyenjes	411.8	Kangaari South	-672	0.65	4.8%
U-39	Siakago	412.1	Nthawa	0	***	***
U-40	Embu	413.7	Embu Municipality	3496	1.54	16.1%
U-41	Isiolo	421.1	Central	-106219	0.05	---
U-42	Oi Doinyo Ng'iro	421.2	Oldonyonyiro	-5533	0.19	---
U-43	Kitui	431.4	Changwithya	-4666	0.38	-1.6%
U-44	Mutomo	433.2	Mutomo	0	***	***
U-45	Mwingi	434.4	Mwingi	-10441	0.21	---
U-46	Machakos	441.1	Muvuti	-38252	0.39	-2.0%
U-47	Mitaboni	441.2	Mitaboni	-8331	0.49	1.2%
U-48	Ati River	442.3	Settlement Area	-12037	0.26	-8.4%
U-49	Uaani/Tawa	444.3	Kiteta	-898	0.05	---
U-50	Kangundo	445.1	Kangundo	-12893	0.20	---
U-51	Nunguni	447.4	Kilungu	-1212	0.04	---
U-52	Emali	448.3	Nzau	-1383	0.04	---
U-53	Mtito Andei&Kibwezi	449.4	Mtito Andei	-15271	0.06	---
U-54	Kargi	452.2	Kargi	-51352	0.02	---

(To be continued)