


JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)
MINISTRY OF AGRICULTURE (MOA)
REPUBLIC OF KENYA

**THE STUDY
ON
COMMUNITY-BASED SMALL HOLDER IRRIGATION
DEVELOPMENT PROJECT
FOR
PROMOTION OF HORTICULTURAL PRODUCTION
IN
THE FOOTHILLS OF MT. KENYA**

ANNEX-II

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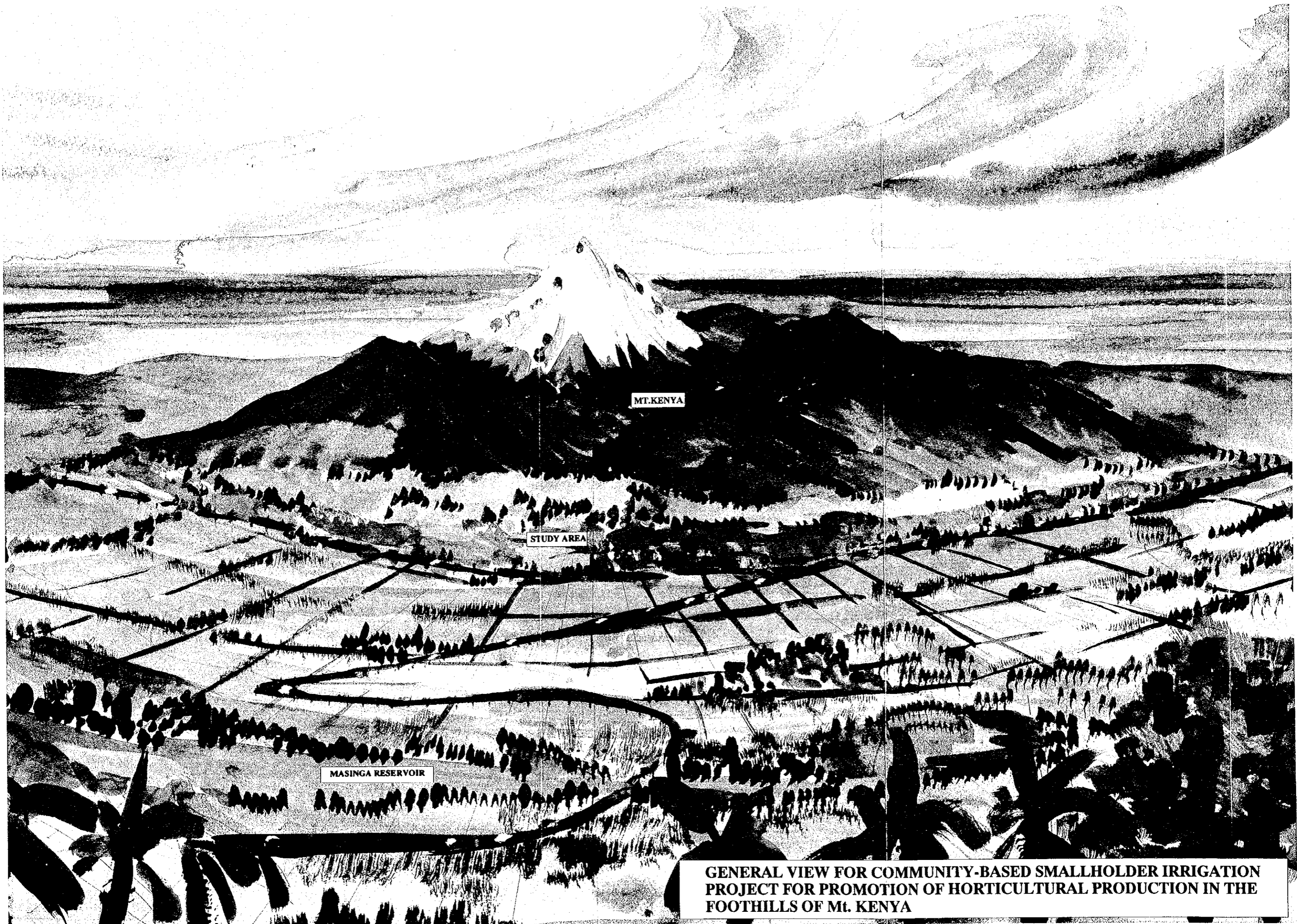
ANNEX-II

MARCH, 1999

SANYU CONSULTANTS INC.



1150408 (1)



MT. KENYA

STUDY AREA

MASINGA RESERVOIR

GENERAL VIEW FOR COMMUNITY-BASED SMALLHOLDER IRRIGATION PROJECT FOR PROMOTION OF HORTICULTURAL PRODUCTION IN THE FOOTHILLS OF Mt. KENYA

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Table L.1-1 Present Condition of Irrigation Scheme and Estimated Irrigation Potential by Sub-basin

1.Nyeri District									
	Irrigated Scheme				Unirrigated Scheme		Total		Estimated Irrigation Potential (ha)
	Number (nos)	Irrigated Area (ha)	Unirrigated Area (ha)	Sub-total (ha)	Number (nos)	Area (ha)	Number (nos)	Area (ha)	
4AA	11	608	401	1,009	10	1,500	21	2,509	468
4AB	1	18	9	27	4	1,205	5	1,232	385
4AC	1	2	22	24	2	52	3	76	76
4AD	1	10	4	14	7	790	8	804	804
4BB	4	103	85	188	7	493	11	681	342
5BA	0	0	0	0	2	110	2	110	17
5BB	3	85	155	240	3	1,843	6	2,083	260
5BC	8	431	780	1,211	2	180	10	1,391	191
5BE	1	120	0	120	2	130	3	250	54
Sub-total	30	1,377	1,456	2,833	39	6,303	69	9,136	2,597
Well	1	4	2	6	0	0	1	6	4
Total	31	1,381	1,458	2,839	39	6,303	70	9,142	2,601

2.Kinnyaga District									
	Irrigated Scheme				Unirrigated Schem		Total		Estimated Irrigation Potential (ha)
	Number (nos)	Irrigated Area (ha)	Unirrigated Area (ha)	Sub-total (ha)	Number (nos)	Area (ha)	Number (nos)	Area (ha)	
4BB	1	112	0	112	3	884	4	996	351
4BC	2	28	797	825	4	131	6	956	520
4DA	15	590	602	1,192	6	618	21	1,810	110
4DB	1	20	10	30	1	377	2	407	407
4DC	0	0	0	0	1	80	1	80	80
Total	19	750	1,409	2,159	15	2,090	34	4,249	1,468

3.Embu District									
	Irrigated Scheme				Unirrigated Schem		Total		Estimated Irrigation Potential (ha)
	Number (nos)	Irrigated Area (ha)	Unirrigated Area (ha)	Sub-total (ha)	Number (nos)	Area (ha)	Number (nos)	Area (ha)	
4DC	8	26	74	100	23	376	31	476	476
4EB	2	3	109	112	1	50	3	162	90
4EC	7	27	128	155	7	115	14	270	270
Total	17	56	311	367	31	541	48	908	836

4.Mbeere District									
	Irrigated Scheme				Unirrigated Schem		Total		Estimated Irrigation Potential (ha)
	Number (nos)	Irrigated Area (ha)	Unirrigated Area (ha)	Sub-total (ha)	Number (nos)	Area (ha)	Number (nos)	Area (ha)	
4BG	5	51	189	240	1	50	6	290	290
4DC	2	3	52	55	0	0	2	55	55
4DD	4	62	448	510	4	840	8	1,350	745
4BB	1	30	30	60	3	550	4	610	338
4EC	7	24	180	204	1	145	8	349	349
4ED	1	5	10	15	0	0	1	15	15
Total	20	175	909	1,084	9	1,585	29	2,669	1,792

5.Tharaka Nithi District									
	Irrigated Scheme				Unirrigated Schem		Total		Estimated Irrigation Potential (ha)
	Number (nos)	Irrigated Area (ha)	Unirrigated Area (ha)	Sub-total (ha)	Number (nos)	Area (ha)	Number (nos)	Area (ha)	
4EA	2	76	28	104	1	52	3	156	91
4EB	11	113	618	731	27	1,056	38	1,787	1,022
4FA	0	0	0	0	5	1,061	5	1,061	0
4FB	0	0	0	0	2	3,800	2	3,800	0
Total	13	189	646	835	35	5,969	48	6,804	1,113

6. Meru District									
	Irrigated Scheme				Unirrigated Schem		Total		Estimated Irrigation Potential (ha)
	Number (nos)	Irrigated Area (ha)	Unirrigated Area (ha)	Sub-total (ha)	Number (nos)	Area (ha)	Number (nos)	Area (ha)	
4EA	26	846	2359	3,205	11	3,913	37	7,118	897
4EB	0	0	0	0	3	300	3	300	161
4FA	77	2,696	15052	17,748	54	7,560	131	25,308	1,701
5BE	10	222	829	1,051	3	73	13	1,124	102
5DA	6	125	291	416	6	1,429	12	1,845	208
Total	119	3,889	18,531	22,420	77	13,275	196	35,695	3,069

7.Nyambene District									
	Irrigated Scheme				Unirrigated Schem		Total		Estimated Irrigation Potential (ha)
	Number (nos)	Irrigated Area (ha)	Unirrigated Area (ha)	Sub-total (ha)	Number (nos)	Area (ha)	Number (nos)	Area (ha)	
4FA	14	186	731	917	4	1,039	18	1,956	117
4FB	14	270	1770	2,040	2	330	16	2,370	225
5ED	3	23	165	188	1	1	4	189	0
Total	31	479	2,666	3,145	7	1,370	38	4,515	342

Table L.1-2 Key Data of Irrigation Scheme in Seven District

(1 of 8)

Code No.	Sub-basin	Serial Number	Project Name	Division	Gross Area (ha)	Net Area (ha)	Fully Iri. Scheme (ha)	Partially Iri. Scheme (ha)	Sub-total (ha)	Unirrigated Area Proposed Scheme (ha)	Sub-total (ha)	Total Area (ha)	Present No. of Irrig. Farmers (hh)	Proposed No. of Irrig. Farmers (hh)	Water Source			
1	4AA	NY-1	Githima	KIENI EAST	60	24	19	0	19	0	0	19	25	0	25 R. Githare			
2	4AA	NY-5	Njerba ikere	KIENI EAST	32	24	8	0	8	0	0	8	5	0	25 R.R. Lintemere			
3	4AA	NY-8	Kirinyaga Nyange	KIENI EAST	1,440	134	67	67	63	63	130	336	0	0	336 R. Nairobi			
4	4AA	NY-10	Mamona & Tagwa	KIENI EAST	736	360	0	0	0	360	360	360	0	0	420 R. Nairobi			
5	4AA	NY-11	Njogishi	KIENI EAST	84	63	24	24	39	39	63	60	0	0	40 R. Nairobi			
6	4AA	NY-12	Kabusini	KIENI EAST	1,200	152	0	0	0	76	76	76	0	0	380 R. Nairobi			
7	4AA	NY-15	Okanga	KIENI EAST	108	88	0	0	0	41	44	44	0	0	270 R. Sagana			
8	4AA	NY-16	Thigu	KIENI EAST	1,800	600	0	0	0	300	300	300	0	0	1,500 R. Thigu			
9	4AA	NY-18	Ndahi Mbirini	KIENI EAST	548	410	55	0	55	0	55	192	0	0	548 R. Sagana			
10	4AA	NY-19	Gatazoza	KIENI EAST	1,200	800	80	0	80	0	80	400	0	0	1,000 R. Nairobi			
11	4AA	NY-22	Wanza Lusoi	KIENI EAST	478	183	61	61	299	299	360	153	0	0	600 R. Nairobi			
12	4AA	NY-23	Island	KIENI EAST	750	300	150	0	150	0	150	375	0	0	375 R. Thigu			
13	4AA	NY-39	Muthethia	MATHIRA	180	160	0	0	0	40	40	40	0	0	150 R. Muthira			
14	4AA	NY-45	Ruhuru	MATHIRA	480	432	0	0	0	80	80	80	0	0	400 R. Sagana			
15	4AA	NY-46	Sagana	MATHIRA	300	260	0	0	0	0	120	250	0	0	250 R. Sagana			
16	4AA	NY-47	Kageti	MATHIRA	51	46	16	0	16	0	16	41	0	0	43 R. Kamunya Stone			
17	4AA	NY-50	Sagana Maganjo	MATHIRA	459	405	0	0	0	20	20	20	0	0	200 R. Sagana (Tana)			
18	4AA	NY-51	Iha	MATHIRA	110	100	0	0	0	30	30	30	0	0	150 R. Muthira			
19	4AA	NY-52	Insi	MATHIRA	600	540	0	0	0	100	100	100	0	0	500 R. Sagana (Tana)			
20	4AA	NY-57	Wangi	MUNICIPALITY	600	480	0	0	0	450	450	450	0	0	600 R. Amboni			
21	4AA	NY-64	Kibiti	TETU	8	8	8	0	8	0	8	8	0	0	30 R. Sagana			
Sub-total					11,165	5,569	456	152	608	401	1,500	1,901	2,509	1,837	7,842			
22	4AB	NY-30	Honi Ruhotic	KIENI WEST	70	27	18	18	9	9	9	27	0	0	24 R. Ruhotic			
23	4AB	NY-34	Mwaga division	KIENI WEST	28,000	4,000	0	0	0	1,000	1000	1,000	0	0	10,000 R. Amboni			
24	4AB	NY-56	Njeru Nyambo	MUNICIPALITY	1,200	1,000	0	0	0	125	125	125	0	0	500 R. Murigato			
25	4AB	NY-58	Karuna	MUNICIPALITY	600	480	0	0	0	60	60	60	0	0	600 R. Sagana			
26	4AB	NY-65	Nyeni Hill	TETU	210	80	0	0	0	20	20	20	0	0	40 R. Murigato			
Sub-total					30,080	5,587	0	18	18	9	1,205	1,214	1,232	0	0	11,164		
27	4AC	NY-63	Kagumo	TETU	12	12	0	0	0	12	12	12	0	0	16 Kiunyua Dam			
28	4AC	NY-66	Kibora	TETU	250	100	0	0	0	40	40	40	0	0	75 R. Kagumo			
29	4AC	NY-69	Ibathi	TETU	46	39	2	2	2	22	24	24	25	0	25 R. Kagumo			
Sub-total					308	151	0	2	2	22	52	74	76	25	0	116		
30	4AD	NY-54	Thua Sagana	MUKURWEINI	128	120	0	0	0	120	120	120	0	0	300			
31	4AD	NY-55	Gakindo	MUKURWEINI	140	85	0	0	0	85	85	85	0	0	220 R. Gikira			
32	4AD	NY-59	Kasuli	OTHAYA	720	648	0	0	0	180	180	180	0	0	600 R. Chinga Dam			
33	4AD	NY-60	Gikuu	OTHAYA	48	43	10	10	4	4	4	14	20	0	20 R. Thuthi Overflow			
34	4AD	NY-61	Kamoko	OTHAYA	420	378	0	0	0	150	150	150	0	0	350 R. Mumwe			
35	4AD	NY-62	Kimondo General	OTHAYA	22	12	0	0	0	4	4	4	0	0	42 R. Mumwe			
36	4AD	NY-67	Kiunyua	TETU	30	20	0	0	0	20	20	20	0	0	60 R. Kiunyua			
37	4AD	NY-68	Aguthi Gaki	TETU	460	400	0	0	0	231	231	231	0	0	1,850 R. Gura			
Sub-total					1,968	1,706	0	10	10	4	790	794	800	20	0	3,442		
38	4BB	NY-7	Karitihi	MATHIRA	1,080	972	0	0	0	90	90	90	0	0	900 R. Ragati			
39	4BB	NY-36	Ihwagi Greenland	MATHIRA	200	180	40	40	40	80	80	120	100	0	250 R. Ragati			
40	4BB	NY-37	Kimbina Kogongo	MATHIRA	78	70	13	13	0	0	13	65	65	0	65 R. Ragati			
41	4BB	NY-38	Kangocho - farrow	MATHIRA	90	81	10	10	5	5	15	75	75	0	75 R. Ragati			
42	4BB	NY-40	Kanjuri	MATHIRA	240	108	40	40	0	0	40	180	180	0	0	200 R. Ragati		
43	4BB	NY-41	Gikore	MATHIRA	120	108	0	0	0	20	20	20	0	0	100 R. Ragati			
44	4BB	NY-42	Gitariduti	MATHIRA	200	170	0	0	0	32	32	32	0	0	160 R. Ragati			
45	4BB	NY-43	Upper Magatu	MATHIRA	360	324	0	0	0	61	61	61	0	0	308 R. Ruirara			
46	4BB	NY-44	Gelazyu/Kiangima	MATHIRA	160	120	0	0	0	120	120	120	0	0	180 R. Ragati			
47	4BB	NY-49	West Magatu	MATHIRA	720	648	0	0	0	90	90	90	0	0	900			
48	4BB	NY-53	Kiamanga	MATHIRA	480	432	0	0	0	80	80	80	0	0	400 R. Ragati			
Sub-total					3,728	3,213	53	50	103	85	493	578	681	420	0	3,536		
49	5BA	NY-31	Kiryani	KIENI WEST	1,120	896	0	0	0	80	80	80	0	0	400 R. Thuru Thuru			
50	5BA	NY-32	Muthani	KIENI WEST	118	40	0	0	0	30	30	30	0	0	41 R. Moyo Zakazaka			
Sub-total					1,238	936	0	0	0	0	110	110	110	0	0	442		
51	5BB	NY-26	Wataka	KIENI WEST	3,408	1,700	43	43	127	127	170	426	426	0	426 R. Ewasonyiro			
52	5BB	NY-27	Lamuria (Rurichu)	KIENI WEST	600	250	36	36	14	14	50	250	250	0	250 R. Nyeregiro			
53	5BB	NY-28	Kiugu	KIENI WEST	41	30	6	6	14	14	20	14	14	0	14 R. Karemeno			
54	5BB	NY-29	Kariguri (Zaka Zaka)	KIENI WEST	50	11	0	0	0	3	3	3	0	0	14 R. Kar. Kariguri			
55	5BB	NY-33	Gatazawa Muganda	KIENI WEST	10,800	7,000	0	0	0	1,800	1800	1,800	0	0	4,500 R. Ewasonyiro			
56	5BB	NY-35	Kabendera	KIENI WEST	480	160	0	0	0	40	40	40	0	0	200 R. Ewasonyiro			
Sub-total					15,379	9,151	0	85	85	155	1,843	1,998	2,083	690	0	5,404		
57	5BC	NY-2	Gatane	KIENI EAST	250	225	0	0	0	90	80	80	0	0	260 R. Darguret			
58	5BC	NY-3	Njogina Gitero	KIENI EAST	1,200	400	80	0	80	0	80	350	350	0	350 R. Birguret			
59	5BC	NY-4	Barguret	KIENI EAST	3,600	600	10	10	290	290	300	100	100	0	3,000 R. Waguthuru			
60	5BC	NY-6	Naromoru W.	KIENI EAST	2,060	160	5	5	0	0	5	250	250	0	250 R. Tigithi			
61	5BC	NY-7	Naromoru A.	KIENI EAST	860	320	120	120	200	200	320	500	500	0	500 R. Naromoru			
62	5BC	NY-9	Gatwe	KIENI EAST	572	100	30	0	30	0	30	300	300	0	300 R. Tigithi			
63	5BC	NY-17	Mwiciare	KIENI EAST	350	140	0	0	0	100	100	100	0	0	350 R. N. Tigithi			
64	5BC	NY-20	Mueru	KIENI EAST	1,600	1,440	30	30	170	170	200	150	1,000	0	1,000 R. Birguret			
65	5BC	NY-21	Kabunda/Nyange	KIENI EAST	720	648	120	120	120	120	240	300	300	0	600 R. Tigithi			
66	5BC	NY-24	Kabendera	KIENI EAST	240	216	36	0	36	0	36	180	180	0	300 R. Tigithi			
Sub-total					11,392	4,249	151	280	431	780	180	960	1,391	2,130	6,850			
67	5BE	NY-13	Mirca B	KIENI EAST	172	129	0	0	0	32	32	32	0	0	160 R. Nanyuki			
68	5BE	NY-14	Kaga	KIENI EAST	1,078	490	0	0	0	98	98	98	0	0	240 R. Nanyuki			
69	5BE	NY-25	Hikus	KIENI EAST	1,600	240	120	0	120	0	120	300	300	0	400 R. Nanyuki			
Sub-total					2,250	859	120	0	120	0	130	130	250	300	0	800		
70	Wells	NY-70	Mutaro	TETU	30	20	4	4	4	2	2	6	13	13	2	2 Shallow Wells		
Sub-total					30	20	0	4	4	2	0	2	6	13	2			
Grand Total					77,538	31,441	780	601	1,381	1,458	6,303	7,761	9,142	5,435	39,600			

Code No.	Sub-basin	Serial Number	Project Name	Division	Gross Area (ha)	Net Area (ha)	Irrigated Area			Unirrigated Area			Total Area (ha)	Present No. of Irrig. Farmers (th)	Proposed No. of Irrig. Farmers (th)	Water Source	
							Fully Irr. Schemes (ha)	Partially Irr. Schemes (ha)	Sub-total (ha)	Partially Irr. Schemes (ha)	Proposed Scheme (ha)	Sub-total (ha)					
1. KUMINYAGA																	
1	4BB	KI- 23	Rukaga	MWEA	3,100	2,480			0		809	809	809	0	1,000	R. Ragati	
2	4BB	KI- 30	Kibirigwi	NDIA	423	333	112		112		0	0	112	277	277	R. Ragati	
3	4BB	KI- 31	Kianocuo	NDIA	120	70			0		30	30	30	0	74	R. Rwasumbaga	
4	4BD	KI- 33	Wakuhima	NDIA	54	45			0		45	45	45	0	27	R. Kanywiri	
		Sub-total			3,697	2,930	112	0	112	0	884	884	996	277	1,378		
5	4BC	KI- 11	Gakindu	MWEA	220	176			0		44	44	44	0	110	R. Rwasumbabi	
6	4BC	KI- 25	Bariho Y. Group	NDIA	61	56	8		8	17	17	25	40	0	40	R. Rwasumbabi	
7	4BC	KI- 26	Getaya	NDIA	120	40			0		20	20	20	0	100	R. Rundu	
8	4BC	KI- 27	Kahabohi	NDIA	40	26			0		15	15	15	0	32	R. Rundu	
9	4BC	KI- 29	Kiamucuka	NDIA	326	52			0		52	52	52	0	263	R. Rwasumbabi	
10	4BC	KI- 34	Githakaki	NDIA	1,000	800	20	20	780		780	780	800	100	500	R. Rwasumbabi	
		Sub-total			1,970	1,150	0	28	28	797	131	928	956	140	1,045		
11	4DA	KI- 1	Kandakame	CENTRAL	180	60	30		30		0	0	30	60	60	R. Kangata	
12	4DA	KI- 2	Gatu	GICHUGU	70	24		14	14	10	10	24	35	60	60	R. Kaboyo	
13	4DA	KI- 3	Otagura	GICHUGU	160	70		40	40	30	30	70	80	145	R. Kiriga		
14	4DA	KI- 4	Oikumbo	GICHUGU	136	65		30	30	5	5	35	68	68	R. Thiba		
15	4DA	KI- 5	Kagumu	GICHUGU	20	14		6	6	8	8	14	14	20	R. Kiriga		
16	4DA	KI- 6	Kiamiciri	GICHUGU	180	160		24	24	96	96	120	40	152	R. Kiriga		
17	4DA	KI- 7	Methaga	GICHUGU	1,000	300			0		160	160	160	0	400	R. Kiriga	
18	4DA	KI- 8	Rukanya	GICHUGU	700	240	175	175	25		25	200	200	200	240	R. Thiba	
19	4DA	KI- 9	Thima-Gatu	GICHUGU	120	60		25	25	35	35	60	63	75	R. Makindu		
20	4DA	KI- 12	Oitooou	MWEA	250	22			0		24	24	24	0	120	R. Nyankungu	
21	4DA	KI- 13	Kariboini	MWEA	283	214	70	70	50		50	120	140	160	R. Thiba		
22	4DA	KI- 14	Karhiga	MWEA	286	150	12	12	68		68	80	100	100	100	R. Thiba	
23	4DA	KI- 15	Kiaruhanga/ Kanyaga	MWEA	430	350			0		50	50	50	0	58	R. Thiba	
24	4DA	KI- 16	Ki Mwachiko	MWEA	1,000	200	30	30	140		140	170	100	720	R. Kiye		
25	4DA	KI- 18	Kithandi/ Rwasohi	GICHUGU	400	176	75	75	25		25	100	40	65	R. Gakuo/Murubara		
26	4DA	KI- 19	Mithuthini	MWEA	138	69	32	32	37		37	69	69	69	69	R. Murubara	
27	4DA	KI- 20	Mitocini-Kombuni	MWEA	334	300			0		266	266	266	0	329	R. Thiba	
28	4DA	KI- 21	Muchungwani	MWEA	210	78		14	14		14	28	35	250	R. Thiba		
29	4DA	KI- 22	Nyangati/ Ngomano	MWEA	400	200	13	13	59		59	72	66	66	66	R. Gakuo/Murubara	
30	4DA	KI- 28	Kaki	NDIA	176	132			0		50	50	50	0	110	R. Kiye	
31	4DA	KI- 32	Mbeti	NDIA	320	68			0		68	68	68	0	170	R. Kangata	
		Sub-total			6,657	2,942	30	560	590	602	618	1,220	1,810	1,110	3,457		
32	4DB	KI- 17	Kirinya/ Kumbui	MWEA	1,180	800			0		377	377	377	0	476	R. Nyamali	
33	4DB	KI- 24	Togonye	MWEA	250	200		20	20	10	10	30	30	30	30	30	R. Redhanga
		Sub-total			1,430	1,000	0	20	20	10	377	387	407	30	506		
34	4DC	KI- 10	Ucumbaga	GICHUGU	150	80			0		80	80	80	0	100	R. Kiye	
		Sub-total			150	80	0	0	0	0	80	80	80	0	100		
Grand Total					13,904	8,102	142	608	750	1,409	2,090	3,499	4,249	1,557	6,486		

Sub-basi	Serial Number	Project Name	Division	Gross Area (ha)	Net Area (ha)	Irrigated Area		Sub-total (ha)	Unirrigated Area		Total Area (ha)	Present No. of Irrig Farmers (th)	Proposed No. of Irrig Farmers (th)	Water Source
						Fully Irr. Scheme (ha)	Partially Irr. Scheme (ha)		Partially Irr. Scheme (ha)	Proposed Scheme (ha)				
1	4DC	EM- 1 Karagaru	CENTRAL	10	9		5.0	5.0	2	2	7	15	20 R. Kapingazi	
2	4DC	EM- 2 Nyakiri	CENTRAL	64	58		0.0	0.0		34	34	0	160 R. Kapingazi	
3	4DC	EM- 8 Gichangai	MANYATTA	40	36		10.0	10.0	10	10	20	80	100 R. Gichangai	
4	4DC	EM- 9 Gturu	MANYATTA	7	5		0.0	0.0		4	4	0	15 R. Nyanjara	
5	4DC	EM- 10 Irati	MANYATTA	4	3		0.0	0.0		2	2	0	20 R. Nyanjara	
6	4DC	EM- 11 Irati	MANYATTA	20	15		0.0	0.0		18	18	0	25 R. Nyanjara	
7	4DC	EM- 12 Kagema	MANYATTA	30	27		0.0	0.0		12	12	0	53 R. Thambana	
8	4DC	EM- 13 Kamuvixidi	MANYATTA	33	30		0.0	0.0		12	12	0	75 R. Kii	
9	4DC	EM- 14 Kambevo	MANYATTA	10	9		0.5	0.5	5	4.5	5	28	37 R. Nyanjara	
10	4DC	EM- 15 Kamvu	MANYATTA	30	27		0.0	0.0		25	25	0	60 R. Kirurumwe	
11	4DC	EM- 16 Kanyiriri	MANYATTA	12	11		0.0	0.0		10	10	0	16 R. Kanyiriri	
12	4DC	EM- 17 Kapingazi	MANYATTA	40	37		0.0	0.0		35	35	0	80 R. Kapingazi	
13	4DC	EM- 18 Karangi	MANYATTA	18	16		3.0	3.0	3	3	6	27	36 R. Karangi	
14	4DC	EM- 19 Karu	MANYATTA	8	6		0.0	0.0		4	4	0	20 R. Thambana	
15	4DC	EM- 20 Kathigari	MANYATTA	36	32		0.0	0.0		15	15	0	45 R. Nyajara	
16	4DC	EM- 21 Kathiogondou	MANYATTA	5	4		0.0	0.0		4	4	0	12 R. Kathiogondou	
17	4DC	EM- 22 Kathuniri	MANYATTA	15	14		0.0	0.0		12	12	0	18 R. Thambana	
18	4DC	EM- 23 Kamubugi	MANYATTA	8	7		0.0	0.0		7	7	0	22 R. Thambana	
19	4DC	EM- 24 Kiaruri	MANYATTA	30	27		1.0	1.0	5	5	6	30	45 R. Nyanjara	
20	4DC	EM- 25 Kabugu	MANYATTA	150	120		0.0	0.0		40	40	0	500 R. Rupingazi	
21	4DC	EM- 26 Kieraha	MANYATTA	14	13		0.0	0.0		10	10	0	20 R. Nyanjara	
22	4DC	EM- 27 Kii	MANYATTA	20	18		4.0	4.0	4	4	8	35	67 R. Kii	
23	4DC	EM- 28 Kithenje	MANYATTA	10	9		0.0	0.0		8	8	0	19 R. Kapingazi	
24	4DC	EM- 29 Makongoro	MANYATTA	10	9		0.0	0.0		7	7	0	35 R. Rupingazi	
25	4DC	EM- 30 Mwira	MANYATTA	30	27		1.5	1.5	11	10.5	12	10	63 R. Rupingazi	
26	4DC	EM- 31 Ndaari	MANYATTA	20	18		0.0	0.0		10	10	0	43 R. Nyanjara	
27	4DC	EM- 32 Nihumbiri	MANYATTA	35	30		0.0	0.0		20	20	0	150 R. Riambaru	
28	4DC	EM- 33 Riambaru	MANYATTA	15	14		0.0	0.0		3	3	0	12 R. Riambaru	
29	4DC	EM- 34 Rupingazi	MANYATTA	40	36		1.0	1.0	35	35	36	18	200 R. Rupingazi	
30	4DC	EM- 35 Rwaraya	MANYATTA	32	29		0.0	0.0		4	4	0	18 R. Rwaraya	
31	4DC	EM- 36 Thambana	MANYATTA	80	70		0.0	0.0		80	80	0	300 R. Thambana	
		Sub-total		876	766	0	26	26	74	376	416	243	2,286	
32	4EB	EM- 3 Gacenga	KYENI	10	9		0.4	0.4	6	5.6	6	1	27 R. Gacenga	
33	4EB	EM- 4 Irani	KYENI	150	70		0.0	0.0		50	50	0	200 R. Kathuchi	
34	4EB	EM- 7 Karu	KYENI	126	114		2.5	2.5	104	103.5	106	10	533 R. Thuci	
		Sub-total		286	193	0	3	3	109	50	162	11	760	
35	4EC	EM- 5 Itimbogo	KYENI	27	24		8.0	8.0	12	12	20	25	40 R. Itimbogo	
36	4EC	EM- 6 Kanyanga	KYENI	30	25		0.0	0.0		18	18	0	40 R. Nyango	
37	4EC	EM- 37 Ikindu	NEMBURE	14	13		0.0	0.0		13	13	0	30 R. Ena	
38	4EC	EM- 38 Kamuraru	NEMBURE	40	16		0.0	0.0		16	16	0	30 R. Kamuraru	
39	4EC	EM- 39 Keyote	NEMBURE	35	33		0.0	0.0		15	15	0	44 R. Kirurumwe	
40	4EC	EM- 40 Kiandundu	NEMBURE	40	36		0.0	0.0		15	15	0	85 R. Ena	
41	4EC	EM- 41 Kianjuki	NEMBURE	30	26		0.0	0.0		26	26	0	60 R. Kirurumwe	
42	4EC	EM- 42 Makengi	NEMBURE	20	18		0.0	0.0		12	12	0	35 R. Kirurumwe	
43	4EC	EM- 43 New Karurumo	NEMBURE	60	54		5.0	5.0	15	15	20	10	75 R. Karurumo	
44	4EC	EM- 44 Ena	RUNYENJES	160	144		2.0	2.0	61	61	63	10	315 R. Ena	
45	4EC	EM- 45 Kamingu	RUNYENJES	15	14		3.0	3.0	4	4	7	28	40 R. Kantiugu	
46	4EC	EM- 46 Kigaritho	RUNYENJES	20	5		1.0	1.0	4	4	5	15	20 R. Kigaritho	
47	4EC	EM- 47 Mwaugu-Kiri	RUNYENJES	50	30		3.0	3.0	27	27	30	60	60 R. Mwaugu	
48	4EC	EM- 48 Ndumunge	RUNYENJES	30	10		5.0	5.0	5	5	10	40	40 R. Ena	
		Sub-total		571	448	0	27	27	128	115	243	188	914	
		Grand Total		1,733	1,407	0	56	56	311	541	852	908	442	3,960

Code No.	Sub-basin	Serial Number	Project Name	Division	Gross Area (ha)	Net Area (ha)	Irrigated Area			Unirrigated Area			Total Area (ha)	Present No. of Irrig. Farmers (hh)	Proposed No. of Irrig. Farmers (hh)	Water Source
							Fully Irr. Scheme (ha)	Partially Irr. Scheme (ha)	Sub-total (ha)	Partially Irr. Scheme (ha)	Proposed Scheme (ha)	Sub-total (ha)				
4. MBERA																
1	4BG	MB- 18	Karaba	MWEA	100	80		5.0	5.0	45.0		45.0	50.0	40	40	R. Tana
2	4BG	MB- 20	Makimo Kithesa	MWEA	200	180		25.0	25.0	55.0		55.0	80.0	34	44	R. Tana
3	4BG	MB- 22	Mbondoni	MWEA	80	40		8.0	8.0	12.0		12.0	20.0	7	40	R. Tana
4	4BG	MB- 24	Nihingru	MWEA	60	40		8.0	8.0	32.0		32.0	40.0	30	60	R. Tana
5	4BG	MB- 25	Wachoro	MWBA	100	80		5.0	5.0	45.0		45.0	50.0	50	100	R. Tana
6	4BG	MB- 26	WangoRinkana	MWBA	100	80		0.0	0.0	0.0	50.0	50.0	50.0	0	50	R. Tana
		Sub-total			640	500	0	51	51	189	50	239	290	161	334	
7	4DC	MB- 14	Rupingazi Y.S.H	GACHOKA	30	20		2.0	2.0	13.0		13.0	15.0	15	60	R. Rupingazi
8	4DC	MB- 15	Rwika Rupingazi	GACHOKA	50	35		1.0	1.0	39.0		39.0	40.0	20	50	R. Rupingazi
		Sub-total			80	55	0	3	3	52	0	52	55	35	110	
9	4DD	MB- 10	Kamugongo	GACHOKA	100	90			0.0		10.0	10.0	10.0	0	16	R. Thiba
10	4DD	MB- 11	Kiaruga	GACHOKA	40	35		2.0	2.0	48.0		48.0	50.0	16	80	R. Thiba
11	4DD	MB- 12	Ndunda	GACHOKA	50	40			0.0		20.0	20.0	20.0	0	30	R. Thiba
12	4DD	MB- 13	Rugongwe	GACHOKA	50	40			0.0		10.0	10.0	10.0	0	17	R. Thiba
13	4DD	MB- 16	Oategi	MWEA	640	240		50.0	50.0	350.0		350.0	400.0	480	480	R. Thiba
14	4DD	MB- 17	Kamunyaga	MWEA	150	100		5.0	5.0	35.0		35.0	40.0	20	50	R. Thiba
15	4DD	MB- 21	Mashamba	MWEA	2,000	800			0.0		800.0	800.0	800.0	0	2,000	R. Thiba
16	4DD	MB- 23	Ngecha	MWEA	30	25		5.0	5.0	15.0		15.0	20.0	25	40	R. Thiba
		Sub-total			3,060	1,370	0	62	62	448	840	1,288	1,350	541	2,713	
17	4EB	MB- 1	Ishira/Kathigi	EVURORE	200	150		30.0	30.0	30.0		30.0	60.0	85	100	R. Thuci
18	4EB	MB- 4	Mia-chuki	EVURORE	900	600			0.0		300.0	300.0	300.0	0	150	R. Thuci
19	4EB	MB- 6	Oekou	EVURORE	200	150			0.0		100.0	100.0	100.0	0	250	R. Thuci
20	4EB	MB- 7	Kagandari	EVURORE	110	60			0.0		150.0	150.0	150.0	0	100	R. Thuci
		Sub-total			1,410	960	0	30	30	30	550	580	610	85	600	
21	4EC	MB- 2	Karerema	EVURORE	112	88			0.0		145.0	145.0	145.0	0	56	R. Ena
22	4EC	MB- 3	Karutianju	EVURORE	30	28		0.4	0.4	24.6		24.6	25.0	15	15	R. Ena
23	4EC	MB- 5	Murunguri	EVURORE	90	80		0.4	0.4	37.6		37.6	38.0	11	31	R. Ena
24	4EC	MB- 8	Kariri	EVURORE	240	200		0.4	0.4	24.6		24.6	25.0	11	15	R. Ena
25	4EC	MB- 9	Kathiga Gacuru	EVURORE	107	100		20.0	20.0	80.0		80.0	100.0	107	150	R. Ena
26	4EC	MB- 27	Gatitu	SIKAGO	17	12		2.0	2.0	3.0		3.0	5.0	34	34	R. Ena
27	4EC	MB- 28	Karigondi	SIKAGO	10	7		0.5	0.5	1.5		1.5	2.0	28	28	R. Ena
28	4EC	MB- 29	Karuru	SIKAGO	15	12		0.5	0.5	8.5		8.5	9.0	30	30	R. Ena
		Sub-total			621	527	0	24	24	180	145	325	349	236	359	
29	4ED	MB- 19	Kikumini/Karura	MWEA	40	25		5.0	5.0	10.0		10.0	15.0	4	20	R. Tana
		Sub-total			40	25	0	5	5	10	0	10	15	4	20	
Grand Total					5,851	3,437	0	175	175	909	1,585	2,494	2,669	1,062	4,136	

Code No	Sub-basi	Serial Number	Project Name	Division	Gross Area (ha)	Net Area (ha)	Irrigated Area			Unirrigated Area		Total Area (ha)	Present No. of Irrig Farmers (hh)	Proposed No. of Irrig Farmers (hh)	Water Source
							Fully Irrig Scheme (ha)	Partially Irrig Scheme (ha)	Sub-total (ha)	Proposed Scheme (ha)	Sub-total (ha)				
THARAKA NORTH															
1	4FA	TN- 45	Ngunu Oakiwe PH1	THARAKA SOUTH	500	260	52		52		0	52	130	130	R. Thing'u
2	4FA	TN- 46	Ngunu Oakiwe PH2	THARAKA SOUTH	1,000	600		24	24	28		28	52	60	130 R. Kiharu
3	4FA	TN- 47	Ngunu Oakiwe PH3	THARAKA SOUTH	800	400			0		52	52	0	130	R. Kiharu
	Sub-total				2,300	1,260	52	24	76	28	52	80	156	190	390
4	4FB	TN- 1	Ciambunga	CHUKA	900	675	52		52		0	52	122	122	R. Naka
5	4FB	TN- 2	Gitwoni	CHUKA	32	14		4	4	10		10	14	19	40 R. Kathera
6	4FB	TN- 3	Gizicho	CHUKA	450	300			0		12	12	0	60	R. Kurugusha
7	4FB	TN- 4	Irigi Farrow	CHUKA	250	50		10	10	30		30	40	70	180 R. Irigi
8	4FB	TN- 5	Kamagutu Farrow	CHUKA	40	30			0.0		20	20	20	0	50 R. Irigi
9	4FB	TN- 6	Kathama Muehege	CHUKA	45	38			0.0		20	20	20	0	32 R. Kathama
10	4FB	TN- 7	Kathoru Farrow	CHUKA	20	15			0		10	10	10	0	30 R. Kathama
11	4FB	TN- 8	Masryaga	CHUKA	2,250	800			0		160	160	160	0	800 R. Masryaga
12	4FB	TN- 9	Mosaga	CHUKA	50	40			0.0		40	40	40	0	60 R. Ruguti
13	4FB	TN- 10	Mburu Mwatjate	CHUKA	1,800	1,400			0		100	100	100	0	250 R. Tungu
14	4FB	TN- 11	Nwintuni	CHUKA	300	100			0		60	60	60	0	150 R. Tungu
15	4FB	TN- 12	Kamwene	IGAMBA NGOMBE	40	15		2	2	8		8	10	12	25 R. Ruguti
16	4FB	TN- 13	Kandondo	IGAMBA NGOMBE	30	26			0		26	26	26	0	65 R. Thuchi
17	4FB	TN- 14	Kiamuramba	IGAMBA NGOMBE	35	30			0		30	30	30	0	38 R. Mara
18	4FB	TN- 15	Kiaritha Women	IGAMBA NGOMBE	64	20			0		54	54	54	0	120 R. Thuchi
19	4FB	TN- 16	Kagutuni	IGAMBA NGOMBE	28	19			0		18	18	18	0	40 R. Thuchi
20	4FB	TN- 17	Kithinge	IGAMBA NGOMBE	30	10			0		10	10	10	0	28 R. Mara
21	4FB	TN- 18	Mparuga	IGAMBA NGOMBE	31	18			0		18	18	18	0	24 R. Mutonga
22	4FB	TN- 19	Mugere	IGAMBA NGOMBE	40	30			0		30	30	30	0	40 R. Mara
23	4FB	TN- 20	Muthari	IGAMBA NGOMBE	400	140			0		140	140	140	0	350 R. Thuchi
24	4FB	TN- 21	Ndotha	IGAMBA NGOMBE	28	20			0		26	26	26	0	30 R. Naka
25	4FB	TN- 22	Muarumbatu	IGAMBA NGOMBE	29	20			0		20	20	20	0	38 R. Mara
26	4FB	TN- 23	Nhithini	IGAMBA NGOMBE	45	40			0		40	40	40	0	5 R. Mara
27	4FB	TN- 24	Numbere	IGAMBA NGOMBE	26	20			0		20	20	20	0	60 R. Ruguti
28	4FB	TN- 25	Inarakithi	MAGUMONI	35	28			0		28	28	28	0	75 R. Mitiisi
29	4FB	TN- 26	Kamogoto	MAGUMONI	20	10			0		10	10	10	0	25 R. Thuci
30	4FB	TN- 27	Kamau	MAGUMONI	23	13			0		13	13	13	0	25 R. Kamau
31	4FB	TN- 28	Migi Women Group	MAGUMONI	40	15			0		7	7	7	0	36 R. Mwiridhie
32	4FB	TN- 29	Makui - Uri	MAGUMONI	600	450			0		24	24	24	0	60 R. Ruguti
33	4FB	TN- 30	Mwiritlao	MAGUMONI	25	10		7	7	3		3	10	20	50 R. Mwiridhie
34	4FB	TN- 31	Nhambo A	MAGUMONI	51	40		5	5.0	0		0	5	10	10 R. Kathithiuku
35	4FB	TN- 32	Nhambo B	MAGUMONI	840	400		5	5.0	75		75	80	10	200 R. Gituanabusi
36	4FB	TN- 33	Gitambani	MWIMBI	300	250			0		70	70	70	0	50 R. Karigi
37	4FB	TN- 34	Iruwa Maguturu	MWIMBI	704	400		12	12	353		353	365	162	2,280 R. Nisara
38	4FB	TN- 35	Kieni	MWIMBI	260	80		2	2	78		78	80	10	450 R. Nisara
39	4FB	TN- 36	Masra	MWIMBI	20	5		2	2	3		3	5	8	50 R. Nisara
40	4FB	TN- 37	Muthande	MWIMBI	600	450			0		50	50	50	0	100 R. Kamara
41	4FB	TN- 38	Thigaa	MWIMBI	105	70		12	12	58		58	70	10	108 R. Kirumwe
	Sub-total				10,526	6,091	52	61	113	618	1,056	1,674	1,787	460	6,156
THARAKA CENTRAL															
42	4FA	TN- 39	Nkoridi	THARAKA CENTRAL	1,710	400			0		365	365	365	0	380 R. Kathitha
43	4FA	TN- 40	Ruarugi	THARAKA CENTRAL	1,000	400			0		66	66	66	0	164 R. Thigithu
44	4FA	TN- 41	Tumburu	THARAKA CENTRAL	1,200	500			0		250	250	250	0	350 R. Kathitha
45	4FA	TN- 44	Nthikuru	THARAKA SOUTH	120	80			0		80	80	80	0	300 R. Ruguti
46	4FA	TN- 48	Nkarini Prop.	THARAKA SOUTH	800	300			0		300	300	300	0	80 R. Thing'u
	Sub-total				4,830	1,680	0	0	0	0	1,061	1,061	1,061	0	1,274
THARAKA NORTH															
47	4FB	TN- 42	Tharaitu	THARAKA NORTH	6,000	3,000			0		3,000	3,000	3,000	0	1,500 R. Thangatha
48	4FB	TN- 43	Uru	THARAKA NORTH	1,600	800			0		800	800	800	0	400 R. Romparu
	Sub-total				7,600	3,800	0	0	0	0	3,800	3,800	3,800	0	1,900
	Grand Total				25,256	12,831	104	85	189	646	5,969	6,615	6,804	650	9,720

Code No.	Sub-basi Number	Serial Number	Project Name	Division	Gross Area (ha)	Net Area (ha)	Irrigated Area			Unirrigated Area			Total Area (ha)	Present No of Irrig Farmers (hh)	Proposed No of Irrig Farmers (hh)	Water Source
							Fully Irrig Scheme (ha)	Partially Irrig Scheme (ha)	Sub-total (ha)	Partially Irrig Scheme (ha)	Proposed Scheme (ha)	Sub-total (ha)				
6. MERU																
1	4EA	ME-	76 Baranga Water Proj	ABOGETA	360	220		30	30	120		120	150	180	180	R. Kithino
2	4EA	ME-	77 Gatankene	ABOGETA	250	120		30	30	50		50	80	100	100	R. Gachuma
3	4EA	ME-	78 Gathigana W Farrow	ABOGETA	240	200			0	100		100	100	0	0	Mukuo Stream
4	4EA	ME-	79 Githiga W. Project	ABOGETA	380	100		15	15	35		35	50	60	60	Gakoo Stream
5	4EA	ME-	80 Gilwa Water Proj	ABOGETA	400	250			0		120		120	0	0	R. Muthanjiri
6	4EA	ME-	81 Igokine Water Ass	ABOGETA	600	350			0		280		280	0	0	R. Kithino
7	4EA	ME-	82 Kangochine W. Farrow	ABOGETA	380	200		60	60	90		90	150	318	318	R. Kithino
8	4EA	ME-	83 Karigi Water Proj	ABOGETA	41	20		3	3	2		2	5	26	26	Karigi Stream
9	4EA	ME-	84 Kathuku Water Farrow	ABOGETA	200	180		60	60	120		120	180	300	300	R. Kithino
10	4EA	ME-	85 Kirambiri Water Proj	ABOGETA	360	300		60	60	40		40	100	300	300	R. Kithino
11	4EA	ME-	86 Kiria Water Proj	ABOGETA	200	100		10	10	30		30	40	50	50	R. Kithino
12	4EA	ME-	87 Kithino Mari	ABOGETA	600	320		60	60	156		156	216	538	538	R. Kithino
13	4EA	ME-	88 Lower Chau/Baranga	ABOGETA	250	75		20	20	70		70	90	120	120	R. Kithino
14	4EA	ME-	89 Lower Kithangari Water	ABOGETA	150	120		12	12	108		108	120	250	250	R. Kabuta
15	4EA	ME-	90 Maras	ABOGETA	3,500	100		10	10	110		110	120	50	50	R. Kithino
16	4EA	ME-	91 Mburu W. Proj.	ABOGETA	240	150			0		260		260	0	0	Katogwe Farrow
17	4EA	ME-	92 Mruine	ABOGETA	440	300			0				260	260	260	R. Itara
18	4EA	ME-	93 Mutwaine W. Proj	ABOGETA	200	150		60	60	40		40	100	300	300	R. Itara
19	4EA	ME-	94 Nyomba ya Kagia	ABOGETA	50	30			0		30		30	0	0	R. Isimbene
20	4EA	ME-	95 Nyomba Yathi W.Proj.	ABOGETA	500	300			0		260		260	0	0	R. Kithino
21	4EA	ME-	96 Lower Kithangari	ABOGETA	1,600	120			0		121		121	0	0	R. Kithino
22	4EA	ME-	101 Mugana W.P.	BOURI	190	60		40	40	20		20	60	80	80	R. Kithino
23	4EA	ME-	103 Gakirene self help	IGOJI	800	700			0		170		170	0	0	R. Thindiki
24	4EA	ME-	104 Gikoi Mwaru Inj.	IGOJI	11,900	3,000			0		2,400		2,400	0	0	R. Mutonga
25	4EA	ME-	105 Mutonga W. Farrow	IGOJI	24	10		6	6	24		24	30	30	30	R. Mutonga
26	4EA	ME-	106 Mutunguru Water Pro.	IGOJI	100	60		10	10	30		30	40	50	50	R. Mutonga
27	4EA	ME-	107 Muara/Gikua W.P.	IGOJI	500	425			0		122		122	0	0	R. Muthonga
28	4EA	ME-	111 Kathigi MCK Water	IGOJI	800	200		40	40	60		60	100	400	400	R. Nthirike
29	4EA	ME-	162 Kigene Kaguru W. Farrow	NKUENE	1,000	50		20	20	60		60	80	80	80	R. Kithino
30	4EA	ME-	163 Cororujogia (Nhu)	NKUENE	300	200		60	60	90		90	150	100	100	R. Kithino
31	4EA	ME-	164 Ithambara Water Proj	NKUENE	300	250		20	20	480		480	500	753	753	R. Mwarara
32	4EA	ME-	165 Kaguru Kironene	NKUENE	260	200		30	30	70		70	100	200	200	R. Kithino
33	4EA	ME-	168 Kithano Mutungu W.P	NKUENE	200	100		30	30	50		50	80	100	100	R. Thingithu
34	4EA	ME-	170 Kithano Green W.P	NKUENE	535	350		60	60	240		240	300	372	372	R. Thangwa
35	4EA	ME-	171 Maguthu Water Proj.	NKUENE	300	160		10	10	134		134	144	50	50	R. Wabata
36	4EA	ME-	178 Mutonge Mutone W.P	NKUENE	400	280		80	80	20		20	100	400	400	Spring
37	4EA	ME-	179 Ngoyiri Water Proj.	NKUENE	350	150		10	10	110		110	120	300	300	R. Kithino
			Sub-total		28,760	9,910	0	846	846	2,359	3,913	6,272	7,118	5,907	15,087	
38	4EB	ME-	108 Thigina Water Proj	IGOJI	2,400	1,800			0		100		100	0	0	R. North Mara
39	4EB	ME-	109 Gakuru Harambee Water	IGOJI	810	610			0		100		100	0	0	Gakuru Maara spring
40	4EB	ME-	110 Kiangua Water Proj.	IGOJI	1,300	300			0		100		100	0	0	R. Maara North
			Sub-total		4,410	2,710	0	0	0	0	300	300	300	0	0	850
41	4FA	ME-	1 Ciontare Water Proj.	ABO CENTRAL	260	210		40	40	160		160	200	780	780	R. Marara
42	4FA	ME-	2 Kairebbi Water Proj.	ABO CENTRAL	80	50		5	5	45		45	50	36	36	R. Garuri
43	4FA	ME-	3 Karunya Water Proj.	ABO CENTRAL	400	250		2	2	198		198	200	10	10	R. Gatimbi
44	4FA	ME-	4 Katharu self help	ABO CENTRAL	100	90		0	0		80	80	80	0	0	R. Gwongji
45	4FA	ME-	5 Central Abothogochi	ABO CENTRAL	6,500	2670		200	200	5,400		5,400	5,600	2,000	14,000	R. Marara
46	4FA	ME-	6 Kapanga Gathimbi	ABO CENTRAL	5,000	400		300	300	1,500		1,500	1,800	3,000	18,000	R. Thingithu
47	4FA	ME-	7 Kithamburu S.H Group	ABO CENTRAL	520	440		3	3	157		157	160	60	60	R. Thambura Ngombe
48	4FA	ME-	8 Mukika Water Proj.	ABO CENTRAL	600	300		2	2	198		198	200	127	127	R. Gathimbi
49	4FA	ME-	9 Nkuene Kathu Water	ABO CENTRAL	800	600.0		0	0		500	500	500	0	0	R. Marara
50	4FA	ME-	10 Nkuu Njumo Water Ass	ABO CENTRAL	100	75		0	0		60	60	60	0	0	R. Marara
51	4FA	ME-	11 Nibunge Water Proj.	ABO CENTRAL	750	75		20	20	13		13	33	50	50	R. Gatanga
52	4FA	ME-	12 Nturiu Water Proj.	ABO CENTRAL	875	650		29	29	22		22	51	57	57	R. Marara
53	4FA	ME-	13 Kariene Water Assoc.	ABO CENTRAL	1,500	400		15	15	40		40	55	150	150	R. Gatanga
54	4FA	ME-	14 Gaku Kaguma W.P	ABO EAST	1,600	1280		10	10	990		990	1,000	400	1,200	R. Marara
55	4FA	ME-	15 Igene Kathiga W.P	ABO EAST	820	800		10	10	210		210	220	225	225	R. Thingithu
56	4FA	ME-	16 Ihari W.P	ABO EAST	240	220		8	8	172		172	180	18	18	R. Marara
57	4FA	ME-	17 Karja Self help W.P	ABO EAST	960	840			0		750	750	750	0	0	R. Marara
58	4FA	ME-	18 Karene W.P	ABO EAST	1,600	800			0		240	240	240	0	0	R. Marara
59	4FA	ME-	19 Kiiga Water Proj.	ABO EAST	300	225			0		180	180	180	0	0	R. Kwari
60	4FA	ME-	20 Marigano W.P	ABO EAST	720	680			0		600	600	600	0	0	R. Kathita
61	4FA	ME-	21 Magana Mbatone W.P	ABO EAST	250	200			0		150	150	150	0	0	R. Gatu
62	4FA	ME-	22 Muthina Githu S.H	ABO EAST	100	25			0		25	25	25	0	0	R. Nduie
63	4FA	ME-	23 Muthya Mutua W.P	ABO EAST	3,000	2,500		2	2	438		438	440	20	20	R. Thingithu
64	4FA	ME-	24 Muthara Women W.P	ABO EAST	1,000	600.0		30	30	370		370	400	308	308	R. Marara
65	4FA	ME-	25 Muthara Women W.P	ABO EAST	650	600			0		500	500	500	0	0	R. Gatu
66	4FA	ME-	26 Ngonga Mbandune	ABO EAST	2,500	2,000			0		400	400	400	0	0	R. Thingithu
67	4FA	ME-	27 Muthama W.P	ABO EAST	300	200			0		200	200	200	0	0	R. Kaugungo
68	4FA	ME-	28 Talata W.P	ABO EAST	1,200	75			0		60	60	60	0	0	R. Kagithu
69	4FA	ME-	29 Muthya Kathiga W.P	ABO EAST	405	243			0		81	81	81	0	0	R. Thingithu
70	4FA	ME-	30 Kianje Water Proj.	ABO EAST	4,500	4,050		3	3	197		197	200	1	1	R. Marara
71	4FA	ME-	31 Ithambara Water Assoc.	ABO WEST	1,000	600		300	300	200		200	500	750	750	R. Marara
72	4FA	ME-	32 Mutungu Water	ABO WEST	80	64		5	5	25		25	30	50	50	R. Marara
73	4FA	ME-	33 Muthara Water Project	ABO WEST	136	74		34	34	18		18	32	56	56	R. Muthara
74	4FA	ME-	34 Muthara self help	ABO WEST	144	76		36	36	28		28	64	48	48	R. Gokorone
75	4FA	ME-	35 Arapara Water	ABO WEST	200	140		4	4	96		96	100	90	90	R. Marara
76	4FA	ME-	37 Gakando Women	ABO WEST	800	600		10	10	70		70	80	100	100	R. Loguso
77	4FA	ME-	38 Gatharua	ABO WEST	410	320		41	41	84		84	125	205	205	R. Kathita
78	4FA	ME-	39 Gathungu Water	ABO WEST	600	500			0		200	200	200	0	0	R. Marara
79	4FA	ME-	40 Gathungu/Karogwa	ABO WEST	240	200		40	40	60		60	100	200	200	R. Mutua
80	4FA	ME-	41 Kabuti Water Ass.	ABO WEST	70	40			0		30	30	30	0	0	R. Nthamburi

Sub-basi	Serial Number	Project Name	Division	Gross Area (ha)	Net Area (ha)	Irrigated Area			Unirrigated Area		Total Area (ha)	Present No. of Irrigating Farmers (hh)	Proposed No. of Irrigating Farmers (hh)	Water Source	
						Fully Irr. Scheme (ha)	Partially Irr. Scheme (ha)	Sub-total (ha)	Partially Irr. Scheme (ha)	Proposed Scheme (ha)					
115	4FA	ME-118	Oankere Water Project	MM EAST	400	180	15	15	35	35	50	50	180 R. Ngaciama		
116	4FA	ME-119	Gietone Ruzumbane WP	MM EAST	260	40				40	40	0	40 R. Gieto Spring		
117	4FA	ME-120	Cichanga Water Proj.	MM EAST	255	130	8	8	112	112	120	170	425 R. Ngaciama		
118	4FA	ME-121	Kazi	MM EAST	1,050	280	50	50	150	150	200	350	750		
119	4FA	ME-122	Kashane Mujoga	MM EAST	3,300	2,400	15	15	105	105	120	150	600 R. Kanyaraha		
120	4FA	ME-123	Kianjagi W.P	MM EAST	600	300	20	20	60	60	80	300	360 R. Riji		
121	4FA	ME-124	Kiburire Furrow I.P	MM EAST	600	150				80	80	0	130 R. Kuzuru		
122	4FA	ME-125	Kiburire Mutetha	MM EAST	405	385				100	100	0	140 R. Kuzuru		
123	4FA	ME-126	Kigoma Water Proj.	MM EAST	20	20	2	2	8	8	10	4	30 R. Karinkuru		
124	4FA	ME-127	Kion Rungene	MM EAST	3,600	800				200	200	200	1,200 Kaburire Spring		
125	4FA	ME-128	Kinani Water Project	MM EAST	72	70				24	24	0	75 Gieto Spring		
126	4FA	ME-129	Kithika Mutetha W.P	MM EAST	400	100				40	40	0	200 Mukungu Spring		
127	4FA	ME-130	Lower Chungu	MM EAST	1,250	500				60	60	0	300 R. Karumathi		
128	4FA	ME-131	Mama Water Project	MM EAST	800	100	10	10	40	40	50	50	200 Gieto Spring		
129	4FA	ME-132	Mugoma Mbanjoni[B]	MM EAST	1,500	120				60	60	0	300 R. Otuau		
130	4FA	ME-133	Mukera Water Project	MM EAST	183	183				24	24	0	60 R. Inyanta		
131	4FA	ME-134	Mulathankari	MM EAST	370	150				60	60	0	200 R. Mulingo Spring		
132	4FA	ME-135	Mutuguru W.P	MM EAST	76	68	17	17		0	17	34	34 R. Karamanjigiri		
133	4FA	ME-136	Mwisenyi SH.	MM EAST	112	100				20	20	0	60 Mukera Spring		
134	4FA	ME-137	Nangitha Water Proj.	MM EAST	240	120	12	12	48	48	60	60	110 R. Agaciama		
135	4FA	ME-138	Ndikere	MM EAST	60	60	24	24	11	11	35	30	28 R. Riji		
136	4FA	ME-139	Ndine Weringa	MM EAST	400	150	10	10	70	70	80	100	200 R. Kathita		
137	4FA	ME-140	Nkamunde Factory	MM EAST	1,000	340	2	2	48	48	50	4	200 R. Kathita		
138	4FA	ME-141	Nkurene W.P	MM EAST	121	115				12	12	0	30 R. Mburkene		
139	4FA	ME-142	Thaura Central W.P	MM EAST	100	90				40	40	0	100 R. Kathita		
140	4FA	ME-143	Thura South	MM EAST	1,400	800	4	4	156	156	160	400	800 R. Kathita		
141	4FA	ME-144	Tui Water Project	MM EAST	800	250	12	12	148	148	160	100	390 R. Kuzuru		
142	4FA	ME-145	Mbua Water Project	MM EAST	486	462	4	4	20	20	24	60	60 R. Kuzuru		
143	4FA	ME-146	Mugoma Mutetha	MM EAST	234	50	15	15	35	35	50	234	760 R. Kuzuru		
144	4FA	ME-147	Umbatha Men. W.P	MM EAST	45	40				20	20	0	50 R. Kiziritha		
145	4FA	ME-148	Ment Children	MM WEST	32	28	1.2	1.2	26	26	30	56	56 G. Gatoora		
146	4FA	ME-149	Gatmana Water	MM WEST	450	120				90	90	0	150 R. Rwaiiri		
147	4FA	ME-150	Kaga Self Help	MM WEST	163	81				81	81	0	200 R. Ngaciama		
148	4FA	ME-151	Mugoma Water Project	MM WEST	202	167	41	41	81	81	121	123	230 Kathita		
149	4FA	ME-152	Gakumbo Water	MM WEST	3,350	800	150	150	450	450	600	670	1,500 Kathita		
150	4FA	ME-153	Kiringa Wendo W.P	MM WEST	540	80				50	50	0	180 R. Kathita		
151	4FA	ME-154	Kiringi W.P	MM WEST	147	109				98	98	0	196 R. Riji		
152	4FA	ME-155	Makene W.P	MM WEST	900	450				15	15	0	1,000 R. Marara		
153	4FA	ME-156	Mugoma Igori Water	MM WEST	660	180				88	88	0	220		
154	4FA	ME-157	Mwiteria Kathiu W.P	MM WEST	270	84				70	70	0	120 R. Kathita		
155	4FA	ME-158	Mworosa W.P	MM WEST	309	210	25	25	225	225	250	75	105 R. Kathita		
156	4FA	ME-159	Ngachama W.P	MM WEST	100	40	20	20	5	5	25	100	300 R. Ngachama		
157	4FA	ME-160	Muganda W.P	MM WEST	900	200	30	30	210	210	240	120	400 R. Wathia		
158	4FA	ME-161	Kambogo Factory	MM WEST	50	30				30	30	0	60 R. Kathita		
159	4FA	ME-166	Kamenchu Water Proj.	NKUENE	250	225	7	7	33	33	40	17	50 R. Gaturugua		
160	4FA	ME-167	Kaurigiri Water Project	NKUENE	100	20	20	20	10	10	30	40	80 R. Marimb/Kamencho		
161	4FA	ME-169	Kitharu Water Proj.	NKUENE	80	70	20	20	0	0	20	40	40 Tharu Stream		
162	4FA	ME-172	Mbaranziga Water	NKUENE	500	140	78	78	92	92	120	50	80 R. Makia		
163	4FA	ME-173	Mitaruni/Garukama	NKUENE	2,500	1,450	10	10	40	40	50	40	57 R. Mukiyu Tri. Thangithu		
164	4FA	ME-174	Mitungu Irrigation	NKUENE	500	500	400	400	0	400	400	305	1,200 R. Thangithu		
165	4FA	ME-175	Mischage Integrated	NKUENE	2,400	200	10	10	190	190	200	50	150 R. Mikuriani		
166	4FA	ME-176	Muguru Water Proj.	NKUENE	84	50				50	50	0	70 R. Thangithu		
167	4FA	ME-177	Mutitha Rugurwo Water	NKUENE	2,300	45				45	45	0	106 R. Thangithu		
168	4FA	ME-180	Njarene	NKUENE	660	400	80	80	220	220	300	980	980 R. Marimb		
169	4FA	ME-181	Nkanga Umoya Water	NKUENE	750	70	6	6	74	74	80	50	120 R. Kauriga		
170	4FA	ME-182	Rugurwo Nana Water Proj.	NKUENE	2,500	150				150	150	0	200 R. Makia		
171	4FA	ME-183	Thangithu W.P	NKUENE	192	100				80	80	0	160 R. Thangithu		
			Sub-total		94,849	48,654	417	2,279	2,696	15,052	7,560	22,612	25,307	17,341	83,866
172	5BE	ME-72	Numbuni W. Proj.	ABO WEST	640	400	10	10	390	390	400	200	1,000 R. Timsu		
173	5BE	ME-184	Kabubungu W. Project	TIMAU	50	30	5	5	4	4	9	22	22 R. Ngumishi		
174	5BE	ME-185	Kiguru I. Project	TIMAU	300	200	40	40	40	40	80	75	100 R. Timsu		
175	5BE	ME-186	Kithitha W.P	TIMAU	2,500	1,000	10	10	20	20	30	50	200 R. Teleswari		
176	5BE	ME-187	Milimari B.W. Proj.	TIMAU	740	500	37	37	163	163	200	370	370 R. Timsu		
177	5BE	ME-188	Mugoma Water Proj.	TIMAU	1,200	600	18	18	142	142	160	200	400 R. Kutugane		
178	5BE	ME-189	Mukuria Water Proj.	TIMAU	60	30	6	6		0	6	15	15 R. Teleswari		
179	5BE	ME-190	Mutunyi Water Proj.	TIMAU	350	300	70	70	30	30	100	200	500 R. Rugusu		
180	5BE	ME-191	Mwachani W. Proj.	TIMAU	6,600	50				30	30	0	23 R. Kungani		
181	5BE	ME-192	Kithika Kio Mutanyi	TIMAU	240	100	24	24	24	24	48	118	236 Kithika Mutanyi Spring		
182	5BE	ME-193	Mwicothia Water Proj.	TIMAU	50	30				28	28	0	24 R. Gachoro		
183	5BE	ME-194	Imara Water Proj.	TIMAU	100	30				15	15	0	20 R. Imara		
184	5BE	ME-196	Umoya Water Project	TIMAU	120	80	2	2	16	16	18	15	45 R. Kungane		
			Sub-total		12,950	3,350	6	216	222	829	73	902	1,124	1,265	2,957
185	5DA	ME-36	Chantere W. Proj.	ABO WEST	150	100				24	24	0	60 R. Chantere		
186	5DA	ME-66	Mwaa Water Proj.	ABO WEST	2,000	1,600				1,200	1,200	0	1,000 R. mwaa/azita		
187	5DA	ME-67	Mwendwa W. Proj.	ABO WEST	300	280				50	50	0	150 R. Ngare Ndete		
188	5DA	ME-68	Mwigiwa W. Proj.	ABO WEST	202	150	10	10	132	132	142	61	100 R. Mwigiwa		
189	5DA	ME-73	Ransene Water Proj.	ABO WEST	40	30				25	25	0	100 R. Riji Rwaii Ngombe		
190	5DA	ME-74	Ruthitene W. Project	ABO WEST	16	12	1	1	11	11	12	5	40 R. Kimba		
191	5DA	ME-97	Kongocheki WP	BUURI	40	40	20	20	15	15	35	75	140 R. Rugusu Spring		
192	5DA	ME-98	Kuamira Proposed Proj.	BUURI	1,000	100				50	50	0	250 R. Kijima Spring		
193	5DA	ME-99	Mugana B	BUURI	120	100				80	80	0	180 R. Kauruta		
194	5DA	ME-100	Nkandu WP	BUURI	200	30	14	14	16	16	30	35	140 R. Mboroki		
195	5DA	ME-102	Mugaku B. Water Ass.	BUURI	435	87	22	22	43	43	65	215	215 R. Riji Rwa Ngombe		
196	5DA	ME-195	Ngare Ndere	TIMAU	300	200	58	58	74	74	132	200	330 R. Ngare Ndere		
			Sub-total		4,803	2,729	0	125	125	291	1,429	1,720	1,845	591	2,705
			Grand Total		145,772	67,353	423	3,466	3,889	18,531	13,275	31,806	35,694	24,704	105,471

Code No.	Sub-basi	Serial Number	Project Name	Division	Gross Area (ha)	Net Area (ha)	Irrigated Area		Unirrigated Area		Total Area (ha)	Present No. of Irrigating Farmers (Hh)	Proposed No. of Irrigating Farmers (Hh)	Water Source	
							Fully Irr. Scheme (ha)	Partially Irr. Scheme (ha)	Sub-total (ha)	Partially Irr. Scheme (ha)					Proposed Scheme (ha)
7. NYAMBENI															
1	4FA	NB-11	Kathima	TIGANIA CENTRAL	16	10		4	4	6	6	10	30	50 R. Thanatu	
2	4FA	NB-13	Ametho I	TIGANIA CENTRAL	150	60		8	8	37	37	45	58	80 R. Rozema	
3	4FA	NB-14	Ametho II	TIGANIA CENTRAL	200	70		20	20	50	50	70	90	90 R. Rumza	
4	4FA	NB-15	Athwana	TIGANIA CENTRAL	900	130			0		120	120	0	600 R. Kithiu	
5	4FA	NB-16	Murega	TIGANIA CENTRAL	1,600	900			0		900	900	0	350 R. Kithimaga	
6	4FA	NB-17	Muacaine	TIGANIA CENTRAL	120	40			0		9	9	0	150 R. Kathima	
7	4FA	NB-18	Thegi	TIGANIA CENTRAL	8	4		1	1	3	3	4	10	10 R. Mabika	
8	4FA	NB-19	Thii	TIGANIA CENTRAL	89	45			0		10	10	0	70 R. Thiti	
9	4FA	NB-20	Amaga	TIGANIA EAST	200	160		10	10	50	60	70	120	120 R. Muumba	
10	4FA	NB-22	Iutha	TIGANIA EAST	150	60		3	3	17	17	20	70	70 R. Thangatha	
11	4FA	NB-31	Kamankigwa	TIGANIA WEST	80	50		10	10	50	60	70	600	600 R. Kamankigwa	
12	4FA	NB-32	Mouruz	TIGANIA WEST	80	50		20	20	30	30	50	80	300 R. Kamankigwa	
13	4FA	NB-33	Kamburu	URINGU	40	25		2	2	23	23	25	7	30 R. Kuruu	
14	4FA	NB-34	Kionde	URINGU	20	16		2	2	14	14	16	3	20 R. Chou	
15	4FA	NB-35	Kisoriba	URINGU	350	300		40	40	160	160	200	150	200 R. Thanatu and Kuu	
16	4FA	NB-36	Machegene	URINGU	400	300		50	50	250	250	300	120	250 R. Kinyariba	
17	4FA	NB-37	Magundi	URINGU	240	120		10	10	40	40	50	30	128 R. Kathima	
18	4FA	NB-38	Uringu	URINGU	8	7		6	6	1	1	7	25	30 R. Kageta	
			Sub-total		4,642	2,337	0	186	186	731	1,039	1,770	1,956	813	3,148
19	4FB	NB-1	Kithethu	IGEMBE CENTRAL	60	30			0		30	30	0	78 R. Kathima	
20	4FB	NB-2	Gakni	IGEMBE EAST	350	150		2	2	58	58	60	10	200 R. Gatui	
21	4FB	NB-3	Gakunku	IGEMBE EAST	150	100		30	30	70	70	100	120	200 R. Gakunui	
22	4FB	NB-4	Kanjoo	IGEMBE EAST	6,000	600		100	100	300	300	400	700	1,000 R. Rujiwero	
23	4FB	NB-5	Kitheo	IGEMBE EAST	900	750		30	30	250	250	280	90	680 R. Kitheo	
24	4FB	NB-6	Ntambiro	IGEMBE EAST	250	200		50	50	100	100	150	100	600 R. Muthacme	
25	4FB	NB-9	Antubochiu	IGEMBE SOUTH	180	40		15	15	5	5	20	90	90 R. Mboone	
26	4FB	NB-10	Kindani/Kihii	IGEMBE SOUTH E.	1,000	300			0		300	300	0	500 R. Kindani	
27	4FB	NB-12	Kisarudaba	NDOLELI	1,200	600		2	2	398	398	400	8	400 R. Kisarudaba	
28	4FB	NB-1	Itharu	TIGANIA EAST	150	70		10	10	60	60	70	36	180 R. Itharu	
29	4FB	NB-23	Kamujine	TIGANIA EAST	200	75		4	4	146	146	150	50	153 R. Kithiu	
30	4FB	NB-24	Kunati	TIGANIA EAST	300	250		2	2.0	198	198	200	25	200 R. Thangatha	
31	4FB	NB-25	Majira	TIGANIA EAST	30	20		4	4	16	16	20	30	50 R. Majira	
32	4FB	NB-26	Muitha	TIGANIA EAST	120	40		5	5	55	55	40	25	80 R. Thanga	
33	4FB	NB-27	Munichia	TIGANIA EAST	150	60		6	6	84	84	90	20	180 R. Ciambaha	
34	4FB	NB-28	Mutine	TIGANIA EAST	150	120		10	10	50	50	60	35	120 R. Thanga	
			Sub-total		11,190	3,405	0	270	270	1,770	330	2,100	2,370	1,339	4,661
35	3ED	NB-7	Kathima	IGEMBE NORTH	45	25		3	3	12	12	15	15	40 R. Kathima	
36	3ED	NB-8	Khamakuu	IGEMBE NORTH	1	1			0		1	1	0	20 R. Kageta	
37	3ED	NB-29	Kamathinwa	TIGANIA NORTH	40	35		10	10	25	25	35	80	80 R. Kamathinwa	
38	3ED	NB-30	Kingirwa	TIGANIA NORTH	400	200		10	10	128	128	138	64	430 R. Wasomara	
			Sub-total		486	261	0	23	23	165	1	166	189	570	
Grand Total					16,318	6,003	0	479	479	2,666	1,370	4,036	4,515	2,311	8,379

Table L.2.1-1 Monthly Rainfall at Embu Meteorological Station(9037202)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1976					41.5	131.1	35.0	10.0	65.5	78.9	170.6	100.2	
1977		49.2	93.8	431.4	201.3	14.5	48.2	33.7	60.0	66.1	390.6	47.3	
1978	43.4	113.8	189.3	422.9	65.8	36.6	15.2	52.7	79.6	255.9	152.4	103.9	1,531.5
1979	144.4	15.6	122.6	284.0	243.9	44.3	30.8	34.3	11.2	129.2	224.9	29.8	1,315.0
1980	7.0		38.7	147.7	216.4	4.1	9.6	42.0	10.1	178.1	267.7	33.9	0.0
1981	4.3	5.2	206.1	394.0	298.9	19.9	12.4	40.9	21.0	112.5	85.0	41.5	1,241.7
1982	6.0		175.3	330.6	264.3	29.0	14.6	25.4	57.7	453.6	131.6	38.1	
1983	0.8	19.6	29.0	363.3	152.6	34.5	22.1	12.5	66.2	138.6	127.6	123.8	1,090.6
1984	1.2		48.4	202.9	15.0	7.8	36.2	19.5	36.5	373.9	164.6	33.3	
1985	0.5	53.2	204.6	302.6	197.6	24.7	30.0	47.1	21.7	153.0	227.6	26.7	1,289.3
1986	1.7		86.5	369.8	141.3	38.9	13.0	32.1	29.2	49.0	382.0	63.5	
1987	14.0	1.8		271.0	159.4	64.3	8.4	95.9	3.7	18.5	316.3	27.2	
1988	2.9	17.6	149.6	562.7	214.9	50.6	22.9	51.2	32.5	204.1	357.2	217.9	1,884.1

Table L.2.1-2(1)-1/2 Irrigation Water Requirement of Rupingazi Ngerwe Irrigation Scheme(Surface Irrigation)

Crop	Irrigation Area = 40 ha												Irrigation Efficiency = 0.50												Operation hours per day = 6 days											
	JAN			FEB			MAR			APR			MAY			JUN			JUL			AUG			SEP			OCT			NOV			DEC		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
1.ETc (mm/day)	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
2.Crop Pests																																				
Coffee	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
Banana	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Niger	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Sweet Potato	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Peas																																				
Millett (w/c)	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
French Beans	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Green Moin																																				
Chickpea	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Other Crops																																				
3.Crop Requirements (mm/day)																																				
Coffee	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
Banana	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Niger	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Sweet Potato	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Peas																																				
Millett (w/c)	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
French Beans	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Green Moin																																				
Chickpea	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Other Crops																																				
4.Effective Rainfall (mm)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.Net Irrigation Requirement (mm/day)	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
Coffee	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
Banana	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Niger	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Sweet Potato	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Peas																																				
Millett (w/c)	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
French Beans	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Green Moin																																				
Chickpea	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Other Crops																																				

Table L.2.2-1 Monthly Rainfall at Tebere Cotton Research Meteorological Station (9037179)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1982	7.1	0.0	135.6	260.0	177.7	8.5	13.2	0.5	52.2	389.3	100.6	21.1	1,145.8
1983	0.0	15.9	2.8	319.5	62.8	32.8	7.2	4.9	0.9	120.8	67.0	122.4	757.0
1984	1.6	0.0	11.7	116.0	20.4	5.0	3.0	2.0	18.5	347.1	149.8	2.8	677.9
1985	3.3	79.5	73.3	356.5	36.4	0.0	5.0	10.1	2.0	59.7	94.0	16.2	736.0
1986	0.0	0.0	49.1	286.5	96.3	16.6	0.0	7.5	4.1	52.5	309.7	116.7	939.0
1988	13.0	14.7	163.6	575.4	125.6	47.0	8.2	16.0	29.1	79.8	288.1	134.1	1,494.6
1989	24.7	4.6	61.3	242.8	85.6	14.1	8.2	14.3	42.0	112.7	237.1	106.3	953.7
1993	139.2	72.4	14.4	121.4	212.4	23.6	14.6	3.6	1.3	69.0	147.9	47.4	867.2
1994	0.0	3.1	61.1	355.0	115.5	14.5	38.6	22.6	19.3	236.4	307.2	75.4	1,248.7
1995	0.0	76.1	83.4	379.5	164.6	4.7	22.0	36.5	3.8	145.3	111.6	92.1	1,119.6

(unit mm)

Table L.2.3-1 Monthly Rainfall at Meru Meteorological Station(8937065)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1966	9.7	41.7	143.0	413.1	45.0	3.6	12.3	3.8		215.7	305.0	16.9	
1967	16.8	18.8	87.4	410.9	318.4	68.6	10.4	10.0	1.9	545.3	450.1	28.8	1,967.4
1968		217.8	221.7	397.9	100.3	17.0	3.1	10.8	1.5	290.7	524.3	176.3	
1969	101.4	227.0	286.2	92.9	216.0		6.9	11.7	106.6	199.9	301.1	19.2	
1970	130.1		113.1	190.5	42.3	12.7	11.2	16.8		47.5	325.0	70.2	
1971	32.1	1.8	52.8	325.3	54.0	14.7	8.9						
1972	31.1	99.8	8.3	78.2	242.3	0.2	4.7	1.2	36.5	504.4	436.0	25.7	1,468.4
1973	52.1	31.3	2.1	179.7	57.9	11.1		34.4	3.7	58.0	262.6		
1974		50.0	130.9	336.7	22.0	14.5	16.1	1.4	41.8	78.7	387.1	95.2	
1975	16.9	18.4	23.0	213.6	133.3	12.9	17.1	9.4	27.5	186.4	176.7	49.1	884.3
1976	11.2	50.4	4.9	227.0	33.1	0.9	11.1	4.8	22.2		158.2	258.5	
1977	37.9	13.3	75.9	362.2	122.2	0.1	14.8	6.1	18.3	157.8	606.6	154.6	1,569.8
1978	70.0	74.8	526.4	481.3	18.9	2.1	12.3	7.1	24.1	241.1	200.6	246.1	1,904.8
1979	263.6	35.9	120.1	287.3	83.4	7.8	4.9	12.0	1.7	97.9	386.7	145.9	1,447.2
1980	78.1		8.8	121.9	124.8		1.1	10.4	3.4	130.6	383.2	23.1	
1981	4.8	25.4	322.0	274.0	168.3	11.2	6.4	10.9	23.1	150.7	225.3	54.1	1,276.2
1982	16.2	0.3	77.5	346.4	214.9	12.4	1.5	5.0	29.3	423.8	231.9	168.2	1,527.4
1983	8.7	49.3	1.7	204.0	201.8	2.3	10.2	14.5	15.3	85.9	171.4	176.3	941.4
1984	10.6	12.1	11.0	154.4	53.2	0.2	15.1	3.7	4.4	496.2	311.6	114.3	1,186.8
1985	23.3	6.2	167.4	249.9	145.7	7.7	16.1	7.7	17.8	144.6	193.4	42.3	1,022.1
1986	5.6	3.6	87.6	417.2	105.6	41.5	1.1	0.5	11.8		237.8	132.3	
1987	34.9		64.0	209.8	93.3	328.1	3.5	16.8		2.2	187.1	29.4	
1988	28.6	32.5	69.4	399.4	64.0	9.1	23.1	29.0	23.0	252.2	288.4	283.5	1,502.2

(unit mm)

Table L.2.4-1 Monthly Rainfall at Marimanti Meteorological Station(9037160)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1981	3.2	0.0	283.6	238.4	78.1	0.0	0.0	0.0	19.0	59.3	0.0	63.1	744.7
1982	0.5	0.3	88.2	334.4	98.9	1.4	1.0	0.0	14.4	280.2	244.9	83.2	1,147.4
1983	0.6	12.5	27.3	266.8	28.6	4.5	0.5	1.9	0.0	46.2	26.7	121.0	536.6
1984	0.0	0.0	18.0	142.0	1.0	0.0	2.0	0.0	13.0	211.5	191.0	71.0	649.5
1985	23.0	71.0	147.3	213.5	37.0	6.0	0.0	0.0	0.0	46.0	197.0	54.0	794.8
1986	0.0	0.0	17.3	249.0	52.9	11.8	0.0	0.0	0.0	36.7	339.9	147.8	855.4
1987	34.7	0.0	31.7	157.3	103.7	38.2	0.0	2.7	0.0	0.0	138.9	61.4	568.6
1989	42.0	1.4	76.7	380.8	63.9	0.0	0.0	0.0	0.4	114.2	213.6	116.6	1,009.6
1995	0.0	36.1	158.5	275.8	71.1	2.5	0.0	0.0	0.0	290.2	127.4	146.2	1,107.8
1996	36.5	0.0	144.2	18.1	0.0	0.0	4.1	0.0	0.0	0.0	242.3	0.0	445.2

(unit mm)

Table L.2.4-2-2/2 Irrigation Water Requirement of Ruungu/Karocho Irrigation Project (Surface Irrigation)

Crop	Irrigation Area = 48 ha												Irrigation Efficiency = 0.50												Operation hours per month = 6 days																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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Onion	21	27	33	39	45	51	57	63	69	75	81	87	93	99	105	111	117	123	129	135	141	147	153	159	165	171	177	183	189	195	201	207	213	219	225	231	237	243	249	255	261	267	273	279	285	291	297	303	309	315	321	327	333	339	345	351	357	363	369	375	381	387	393	399	405	411	417	423	429	435	441	447	453	459	465	471	477	483	489	495	501	507	513	519	525	531	537	543	549	555	561	567	573	579	585	591	597	603	609	615	621	627	633	639	645	651	657	663	669	675	681	687	693	699	705	711	717	723	729	735	741	747	753	759	765	771	777	783	789	795	801	807	813	819	825	831	837	843	849	855	861	867	873	879	885	891	897	903	909	915	921	927	933	939	945	951	957	963	969	975	981	987	993	999	1005	1011	1017	1023	1029	1035	1041	1047	1053	1059	1065	1071	1077	1083	1089	1095	1101	1107	1113	1119	1125	1131	1137	1143	1149	1155	1161	1167	1173	1179	1185	1191	1197	1203	1209	1215	1221	1227	1233	1239	1245	1251	1257	1263	1269	1275	1281	1287	1293	1299	1305	1311	1317	1323	1329	1335	1341	1347	1353	1359	1365	1371	1377	1383	1389	1395	1401	1407	1413	1419	1425	1431	1437	1443	1449	1455	1461	1467	1473	1479	1485	1491	1497	1503	1509	1515	1521	1527	1533	1539	1545	1551	1557	1563	1569	1575	1581	1587	1593	1599	1605	1611	1617	1623	1629	1635	1641	1647	1653	1659	1665	1671	1677	1683	1689	1695	1701	1707	1713	1719	1725	1731	1737	1743	1749	1755	1761	1767	1773	1779	1785	1791	1797	1803	1809	1815	1821	1827	1833	1839	1845	1851	1857	1863	1869	1875	1881	1887	1893	1899	1905	1911	1917	1923	1929	1935	1941	1947	1953	1959	1965	1971	1977	1983	1989	1995	2001	2007	2013	2019	2025	2031	2037	2043	2049	2055	2061	2067	2073	2079	2085	2091	2097	2103	2109	2115	2121	2127	2133	2139	2145	2151	2157	2163	2169	2175	2181	2187	2193	2199	2205	2211	2217	2223	2229	2235	2241	2247	2253	2259	2265	2271	2277	2283	2289	2295	2301	2307	2313	2319	2325	2331	2337	2343	2349	2355	2361	2367	2373	2379	2385	2391	2397	2403	2409	2415	2421	2427	2433	2439	2445	2451	2457	2463	2469	2475	2481	2487	2493	2499	2505	2511	2517	2523	2529	2535	2541	2547	2553	2559	2565	2571	2577	2583	2589	2595	2601	2607	2613	2619	2625	2631	2637	2643	2649	2655	2661	2667	2673	2679	2685	2691	2697	2703	2709	2715	2721	2727	2733	2739	2745	2751	2757	2763	2769	2775	2781	2787	2793	2799	2805	2811	2817	2823	2829	2835	2841	2847	2853	2859	2865	2871	2877	2883	2889	2895	2901	2907	2913	2919	2925	2931	2937	2943	2949	2955	2961	2967	2973	2979	2985	2991	2997	3003	3009	3015	3021	3027	3033	3039	3045	3051	3057	3063	3069	3075	3081	3087	3093	3099	3105	3111	3117	3123	3129	3135	3141	3147	3153	3159	3165	3171	3177	3183	3189	3195	3201	3207	3213	3219	3225	3231	3237	3243	3249	3255	3261	3267	3273	3279	3285	3291	3297	3303	3309	3315	3321	3327	3333	3339	3345	3351	3357	3363	3369	3375	3381	3387	3393	3399	3405	3411	3417	3423	3429	3435	3441	3447	3453	3459	3465	3471	3477	3483	3489	3495	3501	3507	3513	3519	3525	3531	3537	3543	3549	3555	3561	3567	3573	3579	3585	3591	3597	3603	3609	3615	3621	3627	3633	3639	3645	3651	3657	3663	3669	3675	3681	3687	3693	3699	3705	3711	3717	3723	3729	3735	3741	3747	3753	3759	3765	3771	3777	3783	3789	3795	3801	3807	3813	3819	3825	3831	3837	3843	3849	3855	3861	3867	3873	3879	3885	3891	3897	3903	3909	3915	3921	3927	3933	3939	3945	3951	3957	3963	3969	3975	3981	3987	3993	3999	4005	4011	4017	4023	4029	4035	4041	4047	4053	4059	4065	4071	4077	4083	4089	4095	4101	4107	4113	4119	4125	4131	4137	4143	4149	4155	4161	4167	4173	4179	4185	4191	4197	4203	4209	4215	4221	4227	4233	4239	4245	4251	4257	4263	4269	4275	4281	4287	4293	4299	4305	4311	4317	4323	4329	4335	4341	4347	4353	4359	4365	4371	4377	4383	4389	4395	4401	4407	4413	4419	4425	4431	4437	4443	4449	4455	4461	4467	4473	4479	4485	4491	4497	4503	4509	4515	4521	4527	4533	4539	4545	4551	4557	4563	4569	4575	4581	4587	4593	4599	4605	4611	4617	4623	4629	4635	4641	4647	4653	4659	4665	4671	4677	4683	4689	4695	4701	4707	4713	4719	4725	4731	4737	4743	4749	4755	4761	4767	4773	4779	4785	4791	4797	4803	4809	4815	4821	4827	4833	4839	4845	4851	4857	4863	4869	4875	4881	4887	4893	4899	4905	4911	4917	4923	4929	4935	4941	4947	4953	4959	4965	4971	4977	4983	4989	4995	5001	5007	5013	5019	5025	5031	5037	5043	5049	5055	5061	5067	5073	5079	5085	5091	5097	5103	5109	5115	5121	5127	5133	5139	5145	5151	5157	5163	5169	5175	5181	5187	5193	5199	5205	5211	5217	5223	5229	5235	5241	5247	5253	5259	5265	5271	5277	5283	5289	5295	5301	5307	5313	5319	5325	5331	5337	5343	5349	5355	5361	5367	5373	5379	5385	5391	5397	5403	5409	5415	5421	5427	5433	5439	5445	5451	5457	5463	5469	5475	5481	5487	5493	5499	5505	5511	5517	5523	5529	5535	5541	5547	5553	5559	5565	5571	5577	5583	5589	5595	5601	5607	5613	5619	5625	5631	5637	5643	5649	5655	5661	5667	5673	5679	5685	5691	5697	5703	5709	5715	5721	5727	5733	5739	5745	5751	5757	5763	5769	5775	5781	5787	5793	5799	5805	5811	5817	5823	5829	5835	5841	5847	5853	5859	5865	5871	5877	5883	5889	5895	5901	5907	5913	5919	5925	5931	5937	5943	5949	5955	5961	5967	5973	5979	5985	5991	5997	6003	6009	6015	6021	6027	6033	6039	6045	6051	6057	6063	6069	6075	6081	6087	6093	6099	6105	6111	6117	6123	6129	6135	6141	6147	6153	6159	6165	6171	6177	6183	6189	6195	6201	6207	6213	6219	6225	6231	6237	6243	6249	6255	6261	6267	6273	6279	6285	6291	6297	6303	6309	6315	6321	6327	6333	6339	6345	6351	6357	6363	6369	6375	6381	6387	6393	6399	6405	6411	6417	6423	6429	6435	6441	6447	6453	6459	6465	6471	6477	6483	6489	6495	6501	6507	6513	6519	6525	6531	6537	6543	6549	6555	6561	6567	6573	6579	6585	6591	6597	6603	6609	6615	6621	6627	6633	6639	6645	6651	6657	6663	6669	6675	6681	6687	6693	6699	6705	6711	6717	6723	6729	6735	6741	6747	6753	6759	6765	6771	6777	6783	6789	6795	6801	6807	6813	6819	6825	6831	6837	6843	6849	6855	6861	6867	6873	6879	6885	6891	6897	6903	6909	6915	6921	6927	6933	6939	6945	6951	6957	6963	6969	6975	6981	6987	6993	6999	7005	7011	7017	7023	7029	7035	7041	7047	7053	7059	7065	7071	7077	7083	7089	7095	7101	7107	7113	7119	7125	7131	7137	7143	7149	7155	7161	7167	7173	7179	7185	7191	7197	7203	7209	7215	7221	7227	7233	7239	7245	7251	7257	7263	7269	7275	7281	7287	7293	7299	7305	7311	7317	7323	7329	7335	7341	7347	7353	7359	7365	7371	7377	7383	7389	7395	7401	7407	7413	7419	7425	7431	7437	7443	7449	7455	7461	7467	7473	7479	7485	7491	7497	7503	7509	7515	7521	7527	7533	7539	7545	7551	7557	7563	7569	7575	7581	7587	7593	7599	7605	7611	7617	7623	7629	7635	7641	7647	7653	7659	7665	7671	7677	7683	7689	7695	7701	7707	7713	7719	7725	7731	7737	7743	7749	7755	7761	7767	7773	7779	7785	7791	7797	7803	7809	7815	7821	7827	7833	7839	7845	7851	7857	7863	7869	7875	7881	7887	7893	7899	7905	7911	7917	7923	7929	7935	7941	7947	7953	7959	7965	79

ANNEX M

AGRICULTURE AND RURAL INFRASTRUCTURE

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Table M.1-1 Population Served by Water Supply Projects in Seven Districts

	Nyeri District	Kirinyaga District	Embu District	Mbeere District	Tharaka Nithi Dist.	Meru District	Nyambene District	Total	
									(%)
1. Population served by management agency	630,982	248,935	58,000	66,000	25,000	97,750	10,850	1,137,517	63%
a. GOK/MLRRWD/C.C./NWC&PC	13,532	44,791	30,182	30,661	115,959	234,647	177,813	647,585	36%
b. Community by self-help (P/C)	-	6,755	-	-	-	800	5,852	13,407	1%
c. Institutions	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	7,920	7,920	0%
d. Individual/Private/Others	644,514	300,481	88,182	96,661	140,959	333,197	202,435	1,806,429	100%
Total									
(District Population 1997)	729,595	492,942	298,342	175,219	325,770	540,166	591,760	3,153,794	
(Coverage ratio: %)	88%	61%	30% *3	55%	43%	62%	34%	57%	
2. No. of projects by management agency	13	9	3	3	3	7	7	45	8%
a. GOK/MLRRWD/C.C./NWC&PC	14	16	14	14	14	120	202	394	71%
b. Community by self-help (P/C)	-	8	-	-	-	3	15	26	5%
c. Institutions	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	93	93	17%
d. Individual/Private/Others	27	33	17	17	17	130	317	558	100%
Total									

Source: District Water Office, MLRRWD, as of 1997

Note: 1. Data for individual/private are not available except Nyambene district.

2. *1: Institutions are for schools, training centres, hospitals, etc.

3. *2: Individual/Private include tea/coffee estates and factories.

4. *3: Population served by municipal council and county council is not included.

Table M.1-2 Present Status of Water Supply Projects under Investigation, Planning & Design

	Nyeri	Kirin-yaga	Embu	Mbeere	Tharaka Nithi	Meru	Nyam-bene	Total
1. No. of projects by funding source								
1) GOK/MLRRWD/C.C.	3	1	6	1	2	-		13
2) Self-help (P/C)	18	11	-	2	1	14		46
3) Institutional	1	-	-	-	-	2		3
Total	22	12	6	3	3	16	N.A.	62
2. No. of projects by water source								
1) River/stream	22	12	4	1	3	9		51
2) Dam	-	-	1	1	-	-		2
3) Spring	-	-	1	1	-	3		5
4) Others	-	-	-	-	-	4		4
Total	22	12	6	3	3	16	N.A.	62

Source: District Water Office, MLRRWD, as of 1997

Table M.1-3 Road Length of All Roads in Kenya

Class of Road	Bitumen (km)	Gravel (km)	Earth (km)	Total	
				(km)	(%)
1. Classified Roads					
(A) International Trunk Road	2,697	717	241	3,655	6%
(B) National Trunk Roads	1,403	821	524	2,748	4%
(C) Primary Roads	2,590	3,573	1,996	8,159	13%
(D) Secondary Roads	1,187	6,479	3,610	11,276	18%
(E) Minor Roads	712	7,350	18,643	26,705	42%
RAR, SPR	214	8,474	2,432	11,120	17%
All Classified Roads	8,803	27,414	27,446	63,663	100%
(%)	14%	43%	43%	100%	
2. Unclassified Roads					
	-	-	-	85,750	
Total				149,413	

Source: MOPWH, 1996

Note: 1. RAR, SPR include Rural access roads (R), Tea roads (T), Sugar roads (S) Wheat roads (W), Settlement roads (L), & Government access roads (G).

2. Unclassified roads include National parks, Game reserves, Urban roads, Rural roads and Forest roads.

Table M.1-4 Road Length of Classified Roads in Seven Districts

	Nyeri District	Kirinyaga District	Embu District	Mbeere District	Tharaka Nithi Dis	Meru District	Nyambene District	(km)	
								Total	(%)
(Class of Road)									
Class A	72	40	0	0	0	73	12	197	3%
Class B	66	42	46	36	33	56	66	345	5%
Class C	34	47	21	32	32	45	44	255	4%
Class D	319	159	72	119	177	205	189	1,240	19%
Class E	985	353	308	242	264	411	210	2,773	42%
RAR, SPR	654	278	248	177	86	295	116	1,854	28%
Total	2,130	919	695	606	592	1,085	637	6,664	100%
(Road Surface Type)									
Bitumen/Tarmac	342	179	46	36	34	155	75	867	13%
Gravel	1,102	420	283	110	40	478	95	2,528	38%
Earth	686	320	366	460	518	452	467	3,269	49%
Total	2,130	919	695	606	592	1,085	637	6,664	100%

Source: District Public Works Office and JICA Study Team

Table M.1-5 Condition of Classified Roads in Seven Districts

	Nyeri District		Kirinyaga District		Embu District		Mbeere District		Tharaka Nithi Dis		Meru District		Nyambene District		Total	
	km	%	km	%	km	%	km	%	km	%	km	%	km	%	km	%
1.Bitumen/Tarmac																
-Good	95	28	108	60	46	100	36	100	0	0	73	47	12	16	370	43
-Fair	233	68	71	40	0	0	0	0	34	100	82	53	63	84	483	56
-Poor	14	4	0	0	0	0	0	0	0	0	0	0	0	0	14	2
S-Total	342		179		46		36		34		155		75		867	
2.Gravel																
-Good	608	55	60	14	5	2	28	25	0	0	0	0	6	6	707	28
-Fair	438	40	191	45	161	57	77	70	36	90	338	71	46	48	1,287	51
-Poor	56	5	169	40	117	41	5	5	4	10	140	29	43	45	534	21
S-Total	1,102		420		283		110		40		478		95		2,528	
3.Earth																
-Good	434	63	35	11	15	4	45	10	0	0	0	0	0	0	529	16
-Fair	163	24	211	66	303	83	246	53	397	77	150	33	32	7	1,502	46
-Poor	89	13	74	23	48	13	169	37	121	23	302	67	435	93	1,238	38
S-Total	686		320		366		460		518		452		467		3,269	
4.All Roads																
-Good	1,137	53	203	22	66	9	109	18	0	0	73	7	18	3	1,606	24
-Fair	834	39	473	51	464	67	323	53	467	79	570	53	141	22	3,272	49
-Poor	159	7	243	26	165	24	174	29	125	21	442	41	478	75	1,786	27
Total	2,130		919		695		606		592		1,085		637		6,664	

Source: JICA Study Team inventory

Table M.1-6 Road Length and Condition of Classified Roads by Road Class & Surface Type in Seven Districts (1/2)

Unit: km

	Nyeri District			Kirinyaga District			Embu District			Mbeere District			Total
	Good	Fair	Poor	Total	Good	Fair	Poor	Total	Good	Fair	Poor	Total	
1. Class A (International Trunk Roads)													
a. Bitumen/Tarmac	0	72	0	72	40	0	0	40	0	0	0	0	0
b. Gravel	0	0	0	0	0	0	0	0	0	0	0	0	0
c. Earth	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total	0	72	0	72	40	0	0	40	0	0	0	0	0
2. Class B (National Trunk Roads)													
a. Bitumen/Tarmac	0	66	0	66	42	0	0	42	46	0	0	46	36
b. Gravel	0	0	0	0	0	0	0	0	0	0	0	0	0
c. Earth	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total	0	66	0	66	42	0	0	42	46	0	0	46	36
3. Class C (Primary Roads)													
a. Bitumen/Tarmac	3	31	0	34	23	24	0	47	0	0	0	0	0
b. Gravel	0	0	0	0	0	0	0	0	0	0	0	0	0
c. Earth	0	0	0	0	0	0	0	0	21	0	21	21	32
Sub-Total	3	31	0	34	23	24	0	47	0	21	21	21	32
4. Class D (Secondary Roads)													
a. Bitumen/Tarmac	57	51	10	118	2	41	0	43	0	0	0	0	0
b. Gravel	78	63	10	151	5	30	8	43	5	0	0	5	12
c. Earth	0	30	20	50	0	59	14	73	0	67	0	67	107
Sub-Total	135	144	40	319	7	130	22	159	5	67	0	72	119
5. Class E (Minor Roads)													
a. Bitumen/Tarmac	27	13	4	44	0	6	0	6	0	0	0	0	0
b. Gravel	235	203	0	438	0	52	62	114	0	38	0	38	58
c. Earth	358	76	69	503	30	150	53	233	15	207	48	270	184
Sub-Total	620	292	73	985	30	208	115	353	15	245	48	308	242
6. RAR, SPR													
a. Bitumen/Tarmac	8	0	0	8	1	0	0	1	0	0	0	0	0
b. Gravel	295	172	46	513	55	109	99	263	0	123	117	240	40
c. Earth	76	57	0	133	5	2	7	14	0	8	0	8	137
Sub-Total	379	229	46	654	61	111	106	278	0	131	117	248	177
All Roads													
a. Bitumen/Tarmac	95	233	14	342	108	71	0	179	46	0	0	46	36
b. Gravel	608	438	56	1,102	60	191	169	420	5	161	117	283	110
c. Earth	434	163	89	686	35	211	74	320	15	303	48	366	460
Total	1,137	834	159	2,130	203	473	243	919	66	464	165	695	606

Source: District Public Works Office and JICA Study Team inventory

(2/2)

Unit: km

	Tharaka Nithi District			Meru District			Nyambene District			Total			
	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor	Total
	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
1. Class A (International Trunk Roads)													
a. Bitumen/Tarmac	0	0	0	73	0	0	12	0	0	125	72	0	197
b. Gravel	0	0	0	0	0	0	0	0	0	0	0	0	0
c. Earth	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total	0	0	0	73	0	0	12	0	0	125	72	0	197
2. Class B (National Trunk Roads)													
a. Bitumen/Tarmac	0	33	0	0	56	0	0	0	0	124	155	0	279
b. Gravel	0	0	0	0	0	0	0	0	0	0	0	0	0
c. Earth	0	0	0	0	0	0	66	66	66	0	0	66	66
Sub-Total	0	33	0	0	56	0	66	66	66	124	155	66	345
3. Class C (Primary Roads)													
a. Bitumen/Tarmac	0	0	0	0	12	0	44	0	0	26	111	0	137
b. Gravel	0	0	0	0	0	33	0	0	0	0	0	33	33
c. Earth	0	32	0	0	0	0	0	0	0	0	73	12	85
Sub-Total	0	32	0	0	12	33	44	0	0	26	184	45	255
4. Class D (Secondary Roads)													
a. Bitumen/Tarmac	0	0	0	0	13	0	10	0	0	59	115	10	184
b. Gravel	0	31	0	0	55	41	16	10	10	95	195	74	364
c. Earth	0	85	61	0	8	88	30	123	153	34	313	345	692
Sub-Total	0	116	61	0	76	129	56	133	189	188	623	429	1,240
5. Class E (Minor Roads)													
a. Bitumen/Tarmac	0	1	0	0	0	0	9	0	0	27	29	4	60
b. Gravel	0	5	4	0	94	10	30	12	42	256	459	88	803
c. Earth	0	194	60	0	136	171	0	159	159	414	846	650	1,910
Sub-Total	0	200	64	0	230	181	39	171	210	697	1,334	742	2,773
6. RAR/SPR													
a. Bitumen/Tarmac	0	0	0	0	1	0	0	0	0	9	1	0	10
b. Gravel	0	0	0	0	189	56	0	21	27	356	633	339	1,328
c. Earth	0	86	0	0	6	43	2	87	89	81	270	165	516
Sub-Total	0	86	0	0	196	99	2	108	116	446	904	504	1,854
All Roads													
a. Bitumen/Tarmac	0	34	0	73	82	0	12	63	75	370	483	14	867
b. Gravel	0	36	4	0	338	140	46	43	95	707	1,287	534	2,528
c. Earth	0	397	121	0	150	302	32	435	467	529	1,502	1,238	3,269
Total	0	467	125	73	570	442	141	478	637	1,806	3,272	1,786	6,664

Source: District Public Works Office and JICA Study Team inventory

Table M.1-7 Conditions of Access Roads to Irrigation Schemes

Name of District	No. of Irrigation Schemes	Access Road Impassable Period and Length						
		None	1-2 Months		3-4 Months		Over 5 Months	
		No. of Schemes	No. of Schemes	Length (km)	No. of Schemes	Length (km)	No. of Schemes	Length (km)
1. Nyeri District	70	32	25	132.0	10	71.5	3	27.0
2. Kirinyaga District	34	8	7	25.0	9	25.0	10	45.3
3. Embu District	48	36	5	4.1	7	27.2	0	0.0
4. Mbeere District	29	8	16	151.0	2	22.0	3	16.0
5. Tharaka Nithi	48	0	1	2.0	23	321.0	24	184.0
6. Meru District	196	48	10	51.0	69	527.0	69	408.0
7. Nyambene District	38	12	16	151.0	5	37.0	5	80.0
Total	463	144	80	516.1	125	1,030.7	114	760.3
Ratio (%)	100%	31%	17%		27%		25%	

Source: District Profile Up-date Survey by JICA Study Team

Table M.1-8 Existing Health Facilities

	Nyeri District	Kirinyaga District	Embu District	Mbeere District	Tharaka Nithi Dis.	Meru District	Nyambene District	Total
1. Hospitals								
- GOK	-	1	2	1	1	1	1	
- NGO/Private	-	1	3	0	2	4	2	
Total	6	2	5	1	3	5	3	25
2. Health Centres (HCS)								
- GOK	-	4	3	4	2	-	3	
- NGO/Private	-	2	0	3	7	-	1	
Total	10	6	3	7	9	6	4	45
3. Dispensaries (DISP)								
- GOK	-	32	17	20	11	-	5	
- NGO/Private	-	15	6	4	37	-	8	
Total	56	47	23	24	48	18	13	229
4. Maternity/Nursing Homes & Clinics								
- GOK	-	0	-	-	-	0	0	
- NGO/Private	-	11	-	-	-	4	3	
Total	7	11	0	0	0	4	3	25
5. Rural Health Demonstration Centres	0	0	0	0	0	0	1	1
(Total)	79	66	31	32	60	33	24	325
6. Number of Doctors	49	-	-	-	-	16	9	
7. Doctor/Population Ratio	1:14,000	1:30,611	-	1:87,000	1:28,217	1:31,892	1:65,757	

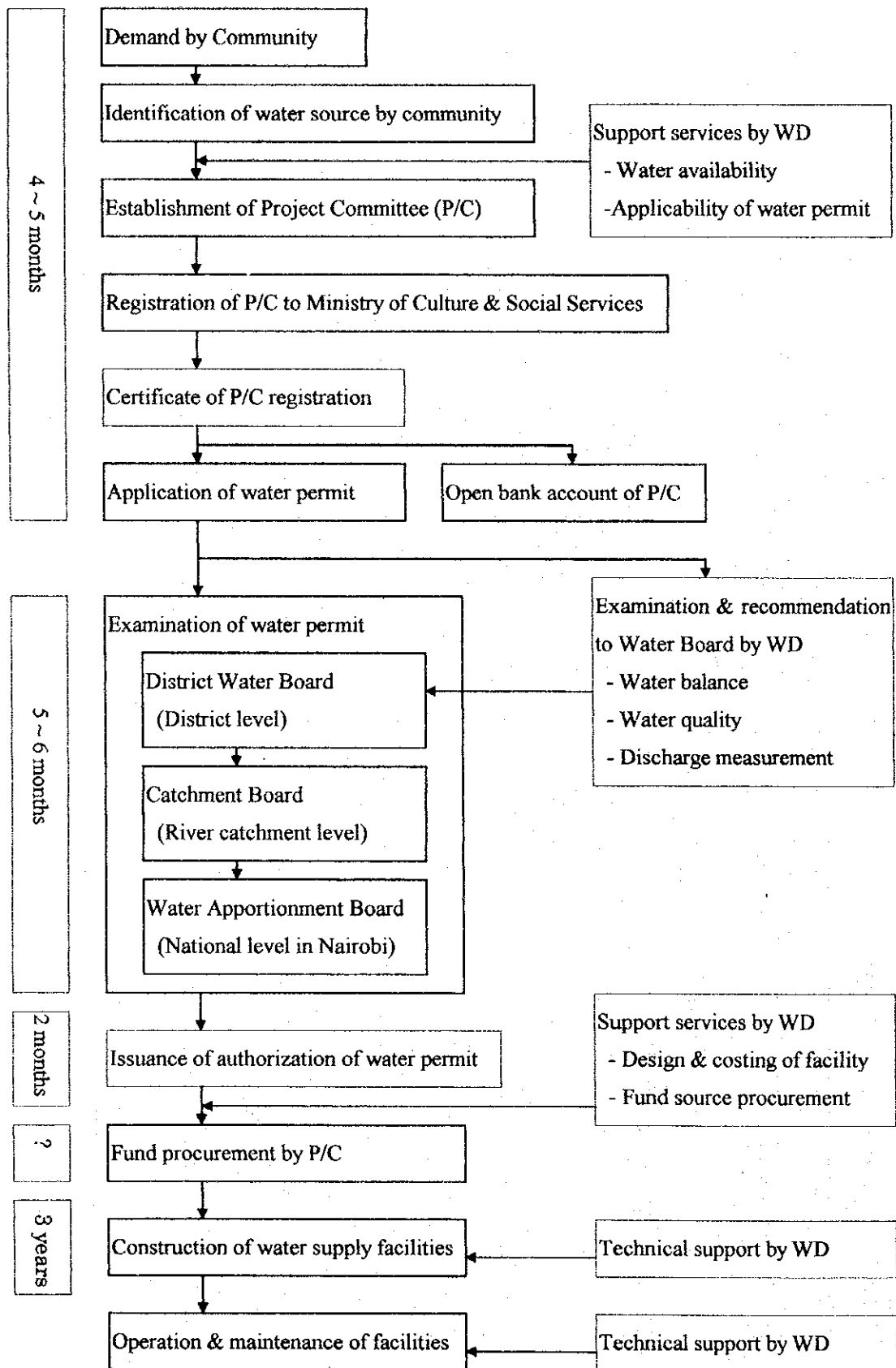
Source: District Development Plan, 1997-2001, Figures are as of 1995/96

Table M.1-9 Existing Education Facilities

	Nyeri District	Kirinyaga District	Embu District	Mbeere District	Tharaka Nithi Dis.	Meru District	Nyamabene District	Total
1. Pre-Primary School	482	225	156	187	334	356	301	2,041
- Boys	15,169	7,527	3,970	-	-	8,679	9,033	44,378
- Girls	14,194	7,343	4,000	-	-	8,017	9,315	42,869
- Total	29,363	14,870	7,970	-	-	16,696	18,348	87,247
2. Primary School	379	189	120	183	359	341	315	1,886
- Boys	85,446	49,058	31,952	22,030	34,308	58,559	51,290	332,643
- Girls	86,160	50,219	33,838	22,267	36,128	61,893	54,617	345,122
- Total	171,606	99,277	65,790	44,297	70,436	120,452	105,907	677,765
- No. of teachers	-	3,282	2,185	1,445	-	4,704	-	-
- Teacher/pupil ratio	1:29	1:30	1:30	1:31	-	1:26	1:32	-
3. Secondary School	126	49	39	22	45	63	40	384
- Boys	14,591	6,892	4,090	2,451	5,673	7,198	3,090	43,985
- Girls	14,647	5,692	4,937	2,062	5,946	9,041	3,195	45,520
- Total	29,238	12,584	9,027	4,513	11,619	16,239	6,285	89,505
- No. of teachers	-	839	553	281	-	1,097	-	-
- Teacher/pupil ratio	1:15	1:15	1:16	1:16	-	1:15	1:15	-
4. Technical Training Institute	3	2	-	1	-	2	-	8
5. Youth Polytechnics	29	9	8	4	19	16	5	90
6. Farmers Training Centre	1	1	-	1	-	1	-	4
7. Teachers Training College	2	-	1	1	1	2	-	7
8. Family Life Centre	-	1	-	1	-	-	-	2
9. Multi-Purpose Dev. Train. Institute	-	-	-	-	-	-	-	1
10. Theological Training Institute	-	-	-	-	-	-	-	1
11. Private Commercial College	-	2	-	-	-	-	-	2

Source: District Development Plan, 1997-2001, Figures are as of 1995/96

Figure M.1-1 Flow Chart of Community-Based Rural Water Supply Project



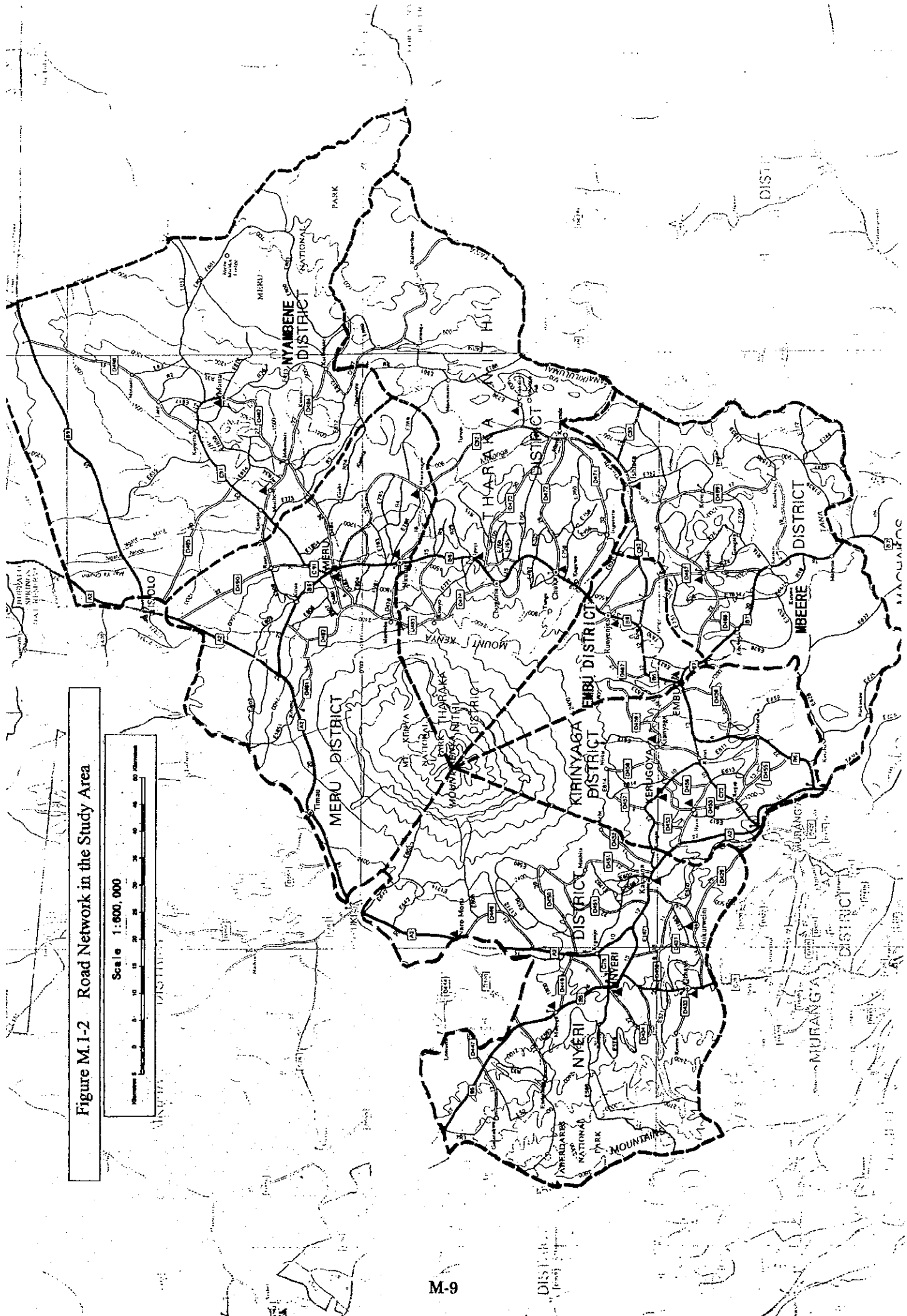


Figure M.1-2 Road Network in the Study Area

