

Table

Table 1.4.1 List of Gauging Station for River Discharge (1/3)

Serial No.	Station Code	Latitude		Longitude		Catchment Area (km ²)	Validity Period				
		Deg.	Min	Deg.	Min		Month	Year		Month	Year
1	1B1B	4	31	38	23	200	Aug.	1970	-	Feb.	1992
2	1B4A	4	31	38	53	7,138	Aug.	1964	-	Aug.	1992
3	1C1	5	1	38	48	650	May	1959	-	Oct.	1990
4	1D8C	3	48	37	30	5,894	Dec.	1964	-	Aug.	1983
5	1D10	4	39	38	2.5	19,018	Apr.	1958	-	Apr.	1982
6	1D12	4	36	37	38	2,114	Feb.	1959	-	Apr.	1974
7	1D14	5	10	38	28	31,031	Apr.	1959	-	June	1990
8	1D16	5	11	38	32	32,680	Jan.	1963	-	June	1991
9	1D17	5	18	38	38	32,918	Sep.	1968	-	May	1992
10	1D18	4	10	37	32	9,970	Aug.	1968	-	May	1982
11	1DA1	5	9	38	34	1,278	Apr.	1953	-	May	1991
12	1DA3A	4	58	38	23	277	Mar.	1967	-	June	1989
13	1DB2A	4	28	38	4	194	Apr.	1963	-	Jan.	1983
14	1DB6A	4	56	38	10	503	July	1965	-	Oct.	1983
15	1DB17	5	1	38	17	1,884	Apr.	1962	-	Nov.	1986
16	1DB18	4	17	37	54	38	May	1961	-	Jan.	1983
17	1DB19	4	50	38	22	311	Oct.	1976	-	Nov.	1991
18	1DB22	4	45	38	13	23	Apr.	1975	-	Aug.	1988
19	1DC1	3	33	37	29	4,192	Mar.	1954	-	Feb.	1964
20	1DC2A	3	31	37	28	3,806	Aug.	1952	-	May	1981
21	1DD1	3	31	37	17	2,896	Sep.	1960	-	June	1981
22	1G1	6	26	37	32	25,787	Oct.	1953	-	Mar.	1983
23	1G2	6	14	38	24	40,227	June	1954	-	Apr.	1984
24	1G5A	6	31	37	13	741	Feb.	1965	-	Apr.	1983
25	1G6	6	37	37	11	140	Mar.	1959	-	Jan.	1990
26	1G8	6	37	37	11	397	Mar.	1959	-	Sep.	1969
27	1GA1	5	5.9	37	49	207	July	1961	-	May	1970
28	1GA1A	5	48	37	48	954	Aug.	1966	-	Oct.	1981
29	1GA2	6	54	37	47	87	Feb.	1965	-	Feb.	1990
30	1GB1A	6	10	37	37	174	Feb.	1964	-	Jan.	1990
31	1GB2	6	15	37	33	91	Apr.	1960	-	Sep.	1969
32	1GD2A	6	50	37	0	10,931	Feb.	1981	-	May	1981
33	1GD29	6	36	36	47	478	Mar.	1969	-	Nov.	1982
34	1GD30	6	50	36	30	596	Mar.	1969	-	Dec.	1975
35	1GD31	6	50	36	56	497	Apr.	1969	-	Jan.	1990
36	1GD36	6	46	37	22	20,974	Aug.	1973	-	June	1981
37	1H5	7	1	37	48	455	Apr.	1959	-	Aug.	1987
38	1H8	6	41	38	42	12,581	Dec.	1958	-	Mar.	1989
39	1H10	7	18	38	10	5,093	Aug.	1966	-	Aug.	1989
40	1HA1	7	2	38	22	2,724	Jan.	1966	-	Mar.	1985
41	1HA8	6	52	37	40	33	Apr.	1960	-	Nov.	1979
42	1HA9A	6	59	37	35	22	Nov.	1962	-	May	1990
43	1HB1	7	28	37	42	114	Oct.	1950	-	Sep.	1963
44	1HB2	7	10	37	33	90	Oct.	1954	-	Dec.	1989
45	1HC2	7	12	37	51	374	Feb.	1954	-	Mar.	1984
46	1HC2A	7	14	37	54	346	Aug.	1967	-	Nov.	1981
47	1J5	6	50	39	0	196	July	1966	-	Nov.	1989
48	1J6	6	57	39	14	539	Apr.	1967	-	Jan.	1988
49	1J7	7	12	39	8	504	May	1967	-	May	1985
50	1KA2A	7	47	35	43	1,913	Jan.	1965	-	Apr.	1985

Table 1.4.1 List of Gauging Station for River Discharge (2/3)

Serial No.	Station Code	Latitude		Longitude		Catchment Area (km ²)	Validity Period				
		Deg.	Min	Deg.	Min		Month	Year	Month	Year	
51	1KA3	7	11	37	1	80,040	Sep.	1969	-	June	1977
52	1KA5	7	5	35	59	67,884	Feb.	1960	-	May	1980
53	1KA7A	8	55	33	58	166	Mar.	1964	-	Dec.	1991
54	1KA8A	8	54	34	7	803	Dec.	1964	-	Oct.	1989
55	1KA9	8	51	34	11	442	Aug.	1955	-	Sep.	1989
56	1KA10A	8	47	34	21	247	Jan.	1965	-	Apr.	1983
57	1KA11A	8	47	34	22	1,600	Oct.	1964	-	May	1983
58	1KA12	8	51	34	34	348	Apr.	1964	-	June	1989
59	1KA15A	8	17	35	13	1,394	Aug.	1964	-	Oct.	1989
60	1KA21A	7	53	35	48	2,609	Nov.	1967	-	Apr.	1987
61	1KA22	8	1	35	47	456	Feb.	1960	-	Sep.	1987
62	1KA23A	9	0	34	33	308	Mar.	1964	-	June	1989
63	1KA27	8	0	34	35	20,123	Oct.	1964	-	Sep.	1979
64	1KA32	8	20	35	20	782	Feb.	1960	-	Mar.	1993
65	1KA33B	8	14	34	48	2,190	Apr.	1979	-	Oct.	1986
66	1KA37A	7	34	36	26	2,992	Nov.	1964	-	Mar.	1987
67	1KA38	7	34	36	47	705	Aug.	1959	-	Nov.	1984
68	1KA39A	8	3	35	41	1,810	Jan.	1965	-	Aug.	1985
69	1KA41	6	18	35	5	8,945	Jan.	1973	-	June	1974
70	1KA42	6	5	35	2	25,628	Mar.	1961	-	Mar.	1982
71	1KA50A	8	47	33	47	108	Dec.	1964	-	Dec.	1991
72	1KA51A	8	49	33	40	64	Apr.	1964	-	Dec.	1991
73	1KA56	8	33	34	51	165	Feb.	1962	-	Sep.	1980
74	1KA59	7	45	34	54	24,320	Dec.	1963	-	May	1985
75	1KA61	7	35	36	47	78,400	Apr.	1967	-	Apr.	1981
76	1KB4	8	55	35	56	18,043	Feb.	1960	-	Aug.	1976
77	1KB8	8	56	35	49	2,585	Feb.	1960	-	Nov.	1978
78	1KB9	9	15	35	40	5,626	Nov.	1959	-	June	1976
79	1KB10	8	57	36	59	14,362	Feb.	1960	-	Aug.	1976
80	1KB14	8	1	36	39	598	Jan.	1960	-	Oct.	1960
81	1KB14A	8	1	36	39	598	Jan.	1966	-	Sep.	1990
82	1KB15	8	20	36	7	305	Mar.	1960	-	Aug.	1989
83	1KB15A	8	20	36	5	329	Aug.	1959	-	Apr.	1975
84	1KB17	8	12	37	0	33,066	Nov.	1959	-	Sep.	1976
85	1KB18A	9	19	34	45	378	Dec.	1966	-	Feb.	1973
86	1KB18B	9	17	34	50	529	Feb.	1976	-	June	1991
87	1KB19	9	24	34	49	331	Dec.	1960	-	Oct.	1980
88	1KB20	9	19	34	45	95	Dec.	1960	-	Feb.	1970
89	1KB23	7	48	36	58	42	Dec.	1961	-	Aug.	1990
90	1KB24	7	46	36	55	39	Dec.	1961	-	Aug.	1990
91	1KB26	7	57	36	57	92	Nov.	1965	-	Aug.	1990
92	1M5	10	35	37	30	11,873	Apr.	1970	-	Feb.	1984
93	1M8	9	5	39	12	2,889	Sep.	1971	-	Aug.	1990
94	1N4A	10	17	39	26	4,648	Apr.	1973	-	Apr.	1982
95	1Q6A	11	0	38	0	1,365	Mar.	1968	-	May	1989
96	1Q7	11	13	35	18	3,414	Feb.	1972	-	Mar.	1989
97	1Q8	11	20.9	37	17.5	71,458	Jan.	1973	-	Feb.	1982
98	1Q9	11	0	38	43	811	Feb.	1973	-	May	1984
99	1Q12	11	15	38	0	3,896	May	1974	-	May	1979
100	1RB2	9	56	35	11	1,940	Mar.	1976	-	Apr.	1994

Table 1.4.1 List of Gauging Station for River Discharge (3/3)

Serial No.	Station Code	Latitude		Longitude		Catchment Area (km ²)	Validity Period				
		Deg.	Min	Deg.	Min		Month	Year		Month	Year
101	1RB3	10	26	34	48	14,481	Feb.	1977	-	Dec.	1978
102	1RB4A	10	15	34	48	2,092	May	1979	-	May	1979
103	1RB5A	10	18	35	4.5	5,622	Mar.	1977	-	Dec.	1992
104	1RB6	10	33	35	1	839	May	1976	-	May	1991
105	1RB10	10	46	34	42	506	July	1975	-	Mar.	1986
106	1RC3A	9	33	33	53	675	Oct.	1961	-	June	1981
107	1RC5A	9	11	33	32	340	July	1971	-	Mar.	1991
108	1RC8A	9	16	33	33	567	Mar.	1966	-	May	1990
109	1RC10	9	20	33	40	456	June	1975	-	Sep.	1990
110	1RC12A	9	18	33	52	120	July	1975	-	Oct.	1982
111	1RD1A	9	36	33	39	3,505	June	1965	-	Aug.	1990
112	1RD2	9	24	33	11	330	Aug.	1975	-	Aug.	1990
113	2K6A	4	38	34	20	246	Mar.	1961	-	Jan.	1987
114	2K7	4	24	34	57	932	June	1970	-	Dec.	1980
115	2K11	3	59	33	57	8,545	Apr.	1969	-	Apr.	1986
116	2K15	4	58	33	54	3,189	Apr.	1969	-	Jan.	1977
117	2K16	4	30	34	40	4,339	Dec.	1973	-	May	1979
118	2K20	3	34	33	50	622	Dec.	1973	-	Apr.	1984
119	2K40	3	27	34	12	1,242	Mar.	1973	-	Apr.	1983
120	2R1A	5	21	35	8	6,958	Apr.	1968	-	Mar.	1984
121	2R4	5	59	35	18	12,762	Jan.	1960	-	Mar.	1982
122	2R25	5	28	34	57	1,073	Feb.	1974	-	Feb.	1979
123	2R24	5	49	35	46	10,563	Jan.	1972	-	June	1974
124	2R27	5	9	35	27	193	Mar.	1972	-	Feb.	1977
125	2R26	5	10	34	48	354	Jan.	1972	-	Feb.	1979
126	2R29	4	25	35	24	1,382	Feb.	1972	-	Apr.	1983
127	3A2A	9	11	33	7	757	May	1965	-	Mar.	1993
128	3A4	8	56	33	21	129	Feb.	1965	-	Sep.	1986
129	3A8	8	59	33	4	163	Sep.	1955	-	Dec.	1994
130	3A16A	8	55	35	5	6,870	Jan.	1978	-	Feb.	1991
131	3A18	8	1	33	17	7,000	Jan.	1976	-	May	1982
132	3B2	8	41	32	23	1,055	June	1975	-	June	1982
133	3B8	9	14	32	50	99	Sep.	1956	-	Dec.	1990
134	3B13	8	59	32	38	1,035	Nov.	1974	-	Mar.	1981
135	3B16A	8	24	31	8	560	Mar.	1982	-	Aug.	1988
136	3CC2	7	45	31	4	1,209	Feb.	1979	-	May	1982
137	3CD2	7	43	31	37	837	Mar.	1976	-	July	1990
138	4A5	4	2	30	35	6,326	Mar.	1975	-	May	1991
139	4AA2	5	4	30	23	2,792	Apr.	1975	-	Jan.	1979
140	4G3	7	28	30	44	376	Mar.	1976	-	June	1990
141	4H1	8	36	31	11.67	2,954	july	1977	-	Dec.	1989
142	5A9	1	16	31	25	55,907	July	1966	-	May	1977
143	5D1	2	38	33	34	1,205	Mar.	1966	-	Feb.	1976

Source: Ministry of Water and Livestock Development

Table 1.5.1 Analyzed Results of Discharge Data by Referred Gauging Station (1/2)

Serial No.	Station Code	Mean Runoff (mm)	Mean Rainfall (mm)	Mean Discharge (m ³ /sec)	Value of Percentages Time Flow Exceeded at P; Q _i (P)																			Base Flow Index (DFI)
					Q5	Q10	Q15	Q20	Q25	Q30	Q35	Q40	Q45	Q50	Q55	Q60	Q65	Q70	Q75	Q80	Q85	Q90	Q95	
1	ID1D	216.2	920.9	1.16	359.7	215.3	174.2	133.1	107.2	87.3	76.5	65.7	57.9	50.1	45.8	41.5	37.2	32.9	30.3	25.1	19.9	14.7	9.5	0.83
2	IB4A	15.3	750.0	5.56	431.2	243.3	175.3	107.2	78.9	61.0	49.9	38.7	32.9	27.0	23.3	19.6	16.5	14.2	11.7	10.3	8.1	5.8	3.1	0.54
3	IC1	339.3	1,086.9	7.11	371.1	209.6	163.2	116.7	95.8	81.1	70.6	60.0	52.9	45.7	40.8	35.8	31.4	26.5	22.4	17.9	13.9	9.9	5.8	0.50
4	ID8C	206.2	1,174.6	38.28	197.1	154.3	140.9	127.4	120.5	113.9	107.0	100.0	95.3	90.5	87.5	84.5	79.3	76.0	69.5	63.8	54.7	45.5	34.8	0.84
5	ID10	27.9	662.6	16.84	200.4	182.9	166.5	150.0	141.9	135.8	130.2	124.6	115.7	106.7	96.9	87.1	85.7	78.0	53.2	0.0	0.0	0.0	0.0	0.91
6	ID12	452.8	950.0	24.21	176.9	130.8	122.4	114.0	109.7	107.3	104.6	101.9	98.6	95.3	91.0	86.6	81.4	75.9	71.5	67.7	64.0	60.2	56.1	0.95
7	ID14	28.7	837.3	27.64	203.6	152.2	133.1	114.0	106.7	100.2	96.9	93.5	90.8	88.1	84.8	81.4	77.0	73.1	70.7	66.2	59.5	52.8	45.4	0.87
8	ID16	31.6	987.3	34.86	239.3	168.9	142.3	115.6	104.0	94.8	90.4	85.9	82.1	78.2	75.5	72.8	70.6	67.8	65.0	52.8	54.0	55.2	48.9	0.88
9	ID17	36.7	919.8	37.96	222.2	165.6	142.3	119.0	105.5	99.1	95.1	91.1	87.8	84.4	80.8	77.1	72.5	69.6	65.9	61.8	55.8	49.8	39.1	0.83
10	ID18	95.2	1,357.2	28.55	169.7	143.4	132.7	122.0	117.1	112.1	109.0	105.9	103.1	100.2	96.7	93.1	89.2	82.3	72.3	64.2	55.8	47.4	38.1	0.86
11	IDA1	107.6	1,393.1	3.95	306.4	263.8	210.6	137.4	129.5	112.8	99.3	85.7	75.6	65.4	58.2	50.9	43.6	36.8	30.2	22.6	15.6	8.6	1.5	0.80
12	IDA3A	315.6	1,380.6	3.57	309.7	230.3	190.9	151.4	126.2	106.9	92.9	78.9	71.0	63.0	57.3	51.5	45.9	39.2	34.1	30.2	23.5	16.8	10.9	0.70
13	IDB2C	298.7	864.7	1.46	399.7	250.1	195.4	140.7	110.7	89.5	73.5	57.4	47.9	38.3	32.2	26.0	20.5	11.6	0.0	0.0	0.0	0.0	0.0	0.66
14	IDB6A	95.8	878.2	1.66	274.5	218.4	187.9	157.4	137.5	117.0	104.4	91.7	80.6	69.4	61.6	53.7	48.3	42.2	36.2	30.2	23.3	16.3	4.8	0.74
15	IDB17	20.8	889.8	2.02	374.8	147.7	124.7	101.6	88.2	76.3	67.4	58.5	51.1	43.6	37.2	30.7	24.3	18.8	14.4	10.9	8.9	6.9	4.0	0.42
16	IDB18	455.8	800.0	0.62	235.3	181.8	159.9	137.9	126.6	113.6	104.7	95.8	88.5	81.1	74.7	68.2	60.1	53.6	50.3	47.1	41.4	35.7	0.0	0.83
17	IDB19	111.4	898.4	0.99	334.6	207.8	165.8	123.7	106.5	93.3	82.7	72.0	65.9	59.8	54.3	48.7	43.6	38.5	34.5	30.4	25.9	21.3	17.2	0.77
18	IDB22	337.7	1,035.8	0.24	242.5	184.0	158.9	133.8	112.9	104.5	98.3	92.0	87.7	75.3	71.1	66.9	62.7	62.7	54.4	46.0	43.9	41.8	33.5	0.84
19	IDC1	120.5	1,800.0	18.02	576.8	278.4	201.3	124.2	94.2	74.0	60.2	46.3	36.8	27.2	22.1	16.9	12.9	9.9	7.4	5.0	3.5	1.9	0.5	0.67
20	IDC2A	51.4	1,709.6	6.55	215.7	160.0	139.9	119.7	108.5	102.0	96.8	91.6	87.3	83.0	79.9	76.8	74.0	69.9	66.7	63.0	59.5	55.9	49.9	0.94
21	IDD1	268.6	1,506.2	22.96	298.5	204.1	166.1	128.0	110.0	95.4	85.9	76.3	70.9	65.4	62.4	59.4	56.9	52.1	46.9	42.3	39.1	35.9	33.2	0.80
22	IG1	32.5	730.4	25.75	457.4	220.6	174.6	128.6	101.0	83.3	71.7	60.0	52.5	45.0	39.9	34.8	30.6	27.2	23.1	18.6	14.0	9.4	5.2	0.78
23	IG2	51.7	765.1	60.21	403.9	239.2	181.1	122.9	95.5	76.4	66.2	56.0	49.1	42.2	37.0	31.8	28.0	24.3	21.2	18.1	14.6	11.1	7.2	0.65
24	IG5A	186.6	981.5	4.47	352.8	207.3	169.5	131.6	107.5	92.5	81.2	69.9	61.3	52.6	47.4	42.1	36.9	30.5	26.2	20.8	14.7	8.5	0.0	0.68
25	IG6	693.4	865.4	3.93	351.3	267.7	206.5	145.3	109.7	86.5	73.8	61.1	54.0	46.8	41.6	36.4	31.8	28.0	23.9	20.9	17.9	14.8	5.6	0.67
26	IG8	3,478.7	943.7	53.40	235.9	174.7	154.8	134.9	125.7	115.1	104.2	93.3	85.5	77.6	72.8	68.0	63.9	58.9	54.5	50.6	46.4	42.2	36.6	0.83
27	IGA1	363.8	983.6	2.35	407.5	313.8	254.7	195.5	115.0	72.8	56.7	40.5	33.9	27.3	23.5	19.6	15.8	12.8	12.4	9.8	8.5	7.2	4.3	0.63
28	IGA1A	77.8	983.6	2.56	369.7	142.0	100.9	59.7	43.7	32.8	25.6	18.3	13.9	9.4	6.3	3.1	1.6	0.4	0.0	0.0	0.0	0.0	0.0	0.68
29	IGA2	171.1	900.0	0.61	518.3	289.6	205.7	121.8	88.9	67.5	54.4	41.1	35.4	29.6	25.5	21.4	18.1	14.8	11.5	8.2	5.8	3.3	1.7	0.47
30	IGB1A	1,528.7	1,070.9	9.56	349.3	218.8	175.2	131.6	107.2	89.7	78.4	67.0	59.0	51.0	45.1	39.2	34.4	29.1	24.8	20.0	16.8	13.6	10.1	0.59
31	IGB2	10,204.7	1,190.9	32.70	339.7	229.2	187.1	144.9	122.3	106.2	93.9	81.6	72.2	62.8	56.5	50.1	41.9	33.2	26.0	21.0	17.5	13.9	10.7	0.66
32	IGD2A	43.6	765.1	9.91	366.2	233.8	185.2	136.6	115.5	100.8	88.6	76.4	65.9	55.3	48.3	41.2	34.6	25.5	15.7	9.1	6.1	3.1	1.6	0.76
33	IGD29	181.5	1,095.7	2.87	227.6	170.4	150.4	130.3	120.2	109.8	101.3	92.7	86.6	80.5	75.1	69.7	64.1	59.9	55.4	51.9	47.9	43.9	39.0	0.79
34	IGD30	38.2	739.8	0.81	262.0	213.6	185.1	136.5	134.1	120.5	105.0	89.4	81.4	73.3	67.1	60.9	55.9	44.7	39.2	33.5	27.3	21.1	16.1	0.72
35	IGD31	281.8	1,100.0	4.58	273.6	189.6	158.9	128.1	110.8	99.3	90.4	81.4	75.2	68.9	64.6	60.2	55.4	50.4	46.2	41.9	37.4	32.9	27.5	0.77
36	IGD36	7.9	600.7	7.64	286.7	222.1	187.6	133.0	131.3	113.4	99.9	86.3	77.3	68.2	60.8	53.4	45.4	40.6	37.2	34.6	29.1	23.6	18.5	0.80
37	IHS	1,277.4	901.3	18.77	289.2	217.0	185.5	154.0	133.8	115.9	100.1	84.2	74.4	64.5	57.6	50.6	43.3	40.1	36.4	32.2	28.4	24.5	20.7	0.69
38	IHS8	166.5	1,339.6	61.79	386.5	262.3	201.7	141.1	104.9	89.9	77.9	65.8	57.8	49.7	44.1	38.4	33.2	29.2	25.9	23.0	19.9	16.8	13.0	0.73
39	IHS10	289.5	2,071.9	45.94	331.6	239.7	190.4	141.1	112.3	89.4	77.7	66.0	60.2	54.3	49.7	45.1	40.6	36.7	33.0	28.7	24.2	19.6	12.0	0.64
40	IHA1	56.5	1,783.5	5.04	427.0	260.6	202.1	143.6	111.4	88.4	72.9	57.4	48.4	39.3	33.5	27.6	23.0	18.7	14.3	10.7	7.6	4.4	4.0	0.63
41	IHA8	875.1	903.4	0.83	386.9	234.7	182.7	130.6	102.2	83.8	70.7	57.5	49.1	40.7	34.7	28.7	25.2	21.6	18.0	15.6	12.6	9.6	4.8	0.53
42	IHA9A	1,414.5	1,584.2	0.98	345.5	219.5	173.8	128.0	105.7	87.4	73.7	60.0	52.4	44.7	41.2	37.6	34.6	31.5	27.4	26.4	23.9	21.3	15.2	0.56
43	IHB1	11,669.9	1,160.0	43.21	401.0	277.5	207.8	138.1	102.0	81.8	65.9	50.0	42.9	35.8	31.8	27.7	24.2	20.9	17.9	15.1	13.3	11.5	8.4	0.54
44	IHB2	957.4	1,340.7	2.58	241.3	182.0	156.9	131.7	120.4	111.9	103.6	95.3	87.4	79.4	74.0	68.6	62.4	56.9	53.8	49.2	44.6	39.9	34.5	0.81
45	IHC2	2,198.3	1,155.5	17.03	317.1	214.3	182.9	151.5	133.3	115.1	98.4	81.6	68.6	55.6	48.5	41.4	36.8	32.6	29.1	26.6	21.5	16.4	11.6	0.62
46	IHC2A	187.5	1,155.5	2.50	388.3	242.2	176.0	109.7	91.3	79.3	72.1	64.9	58.5	52.0	46.4	40.8	36.8	33.2	30.0	26.8	23.8	20.8	16.4	0.54
47	IHS	94.6	1,000.0	0.60	390.0	283.8	217.4	151.0	117.8	96.3	82.2	68.0	57.3	46.5	39.9	33.2	26.6	23.2	18.3	14.9	11.6	8.3	5.0	0.64
48	IJ6	59.1	1,223.3	1.07	546.0	376.4	258.1	139.8	70.8	52.2	43.4	34.5	28.5	22.4	16.8	11.2	7.5	4.7	1.9	0.9	0.5	0.0	0.0	0.47
49	IJ7	39.0	890.7	0.67	398.5	263.7	218.5	173.3	146.7	118.5	94.1	69.6	44.5	19.3	10.4	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.88
50	IKA2A	211.2	1,140.0	20.82	217.9	196.7	175.7	154.6	137.8	125.8	115.4	105.0	96.0	86.9	78.9	70.9	62.9	56.8	51.4	45.4	38.3	31.2	24.7	0.90
51	IKA3	59.9	950.0	165.23	385.8	287.5	223.2	158.9	124.5	95.5	77.5	59.4	51.7	43.9	38.4	32.9	29.0	24.9	22.2	18.6	16.2	13.8	11.4	0.83
52	IKA5	62.4	612.5	119.09	422.4																			

Table 1.5.1 Analyzed Results of Discharge Data by Referred Gauging Station (2/2)

Serial No.	Station Code	Mean Runoff (mm)	Mean Rainfall (mm)	Mean Discharge (m ³ /sec.)	Value of Percentage Time Flow Exceeded at P; Q _i (P)																			Base Flow Index (BFI)	
					Q5	Q10	Q15	Q20	Q25	Q30	Q35	Q40	Q45	Q50	Q55	Q60	Q65	Q70	Q75	Q80	Q85	Q90	Q95		
83	1KB15A	1,926.2	1,867.5	18.56	289.8	211.0	180.5	150.0	131.1	110.5	98.5	86.4	76.3	66.2	59.5	52.7	48.6	44.3	40.3	36.5	33.6	30.7	27.5	0.79	
84	1KB17	502.9	1,000.0	322.43	312.9	248.9	198.0	147.1	116.8	96.1	83.4	70.6	64.5	58.3	53.9	49.4	46.1	42.8	39.1	35.8	32.7	29.5	26.5	0.89	
85	1KB18A	392.5	1,316.0	4.37	277.1	204.8	178.5	152.1	131.9	117.3	105.9	94.4	85.2	76.0	68.7	61.4	55.2	48.8	43.5	37.8	31.2	24.5	18.1	0.86	
86	1KB18E	357.1	1,316.0	7.17	271.5	224.9	194.2	163.5	143.1	127.7	113.1	98.4	86.1	73.7	64.2	54.6	49.0	43.5	37.4	31.5	25.5	19.4	0.0	0.87	
87	1KB19	289.4	1,334.6	3.44	270.2	213.5	181.4	149.3	131.0	113.0	101.4	89.8	81.1	72.3	65.2	58.1	51.1	46.5	41.0	36.6	33.0	29.3	25.6	0.81	
88	1KB20	463.7	1,400.0	1.47	346.6	147.4	137.6	127.8	107.4	94.5	86.0	77.5	69.7	61.8	55.1	48.3	44.2	40.1	36.7	32.6	29.2	25.8	19.7	0.79	
89	1KB23	737.5	1,400.0	0.99	346.2	261.4	215.0	168.5	134.2	103.9	86.8	69.6	58.5	47.4	40.4	33.3	30.3	25.2	21.1	14.1	7.1	0.0	0.0	0.70	
90	1KB24	704.5	1,400.0	0.69	323.0	232.8	192.1	151.3	125.1	106.2	91.0	75.7	66.2	56.7	48.7	40.7	36.4	32.0	27.6	24.7	21.8	18.9	14.6	0.70	
91	1KB26	585.9	1,400.0	2.51	350.2	267.4	203.5	139.5	114.8	99.6	85.3	70.9	61.6	52.2	45.7	39.1	33.5	26.7	22.3	18.3	15.0	11.6	6.8	0.60	
92	1M5	30.4	838.9	12.63	534.6	262.0	183.6	105.1	71.0	47.4	35.0	22.5	16.7	10.8	7.3	3.7	2.5	1.6	1.0	0.6	0.4	0.1	0.0	0.45	
93	1M8	47.8	1,202.2	3.78	611.0	285.8	168.0	50.2	29.9	18.5	15.2	11.9	10.7	9.5	9.0	8.5	6.9	6.3	5.8	4.5	4.1	3.7	2.4	0.67	
94	17.6	1,000.0	2.63	518.8	279.1	194.5	109.8	79.0	60.0	48.8	37.1	26.6	23.2	19.8	19.4	17.1	17.1	12.5	8.6	4.6	0.0	0.0	0.0	0.72	
95	1Q6A	51.0	1,000.0	3.84	452.9	304.9	198.0	91.0	54.1	33.8	23.4	13.0	7.4	1.8	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.22
96	1Q7	43.7	1,100.0	48.67	229.9	184.5	164.4	144.2	126.3	113.3	102.9	92.4	84.9	77.3	72.3	67.3	62.5	58.3	53.7	50.3	44.3	38.2	31.1	0.35	
97	1Q8	20.5	1,050.0	0.20	640.4	500.3	303.2	110.1	65.0	40.0	30.0	20.0	15.0	10.0	7.5	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.85
98	1Q9	8.8	1,000.0	1.70	326.5	120.8	70.4	20.0	10.6	7.1	4.8	2.4	2.1	1.8	1.8	1.8	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.59
99	1Q12	726.6	1,000.0	3.84	495.1	248.5	163.0	77.4	40.6	17.2	10.5	3.7	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.85
100	1RB2	712.3	1,000.0	42.97	196.2	167.4	151.1	134.8	123.9	114.9	107.0	99.0	93.2	87.3	82.7	78.1	73.6	68.0	65.0	61.0	55.5	49.9	44.3	0.89	
101	1RB3	344.6	1,982.6	179.49	289.9	218.2	181.8	145.4	123.7	107.9	96.8	85.6	78.6	71.5	64.9	58.2	52.4	48.0	42.9	38.6	33.3	27.9	23.6	0.82	
102	1RB4A	300.8	1,476.3	24.40	312.1	204.4	172.1	139.8	120.9	103.7	91.8	79.9	72.0	64.0	57.1	50.2	44.7	39.3	35.0	29.8	24.8	19.8	16.5	0.73	
103	1RB5A	283.6	1,314.9	59.00	297.8	197.0	164.7	132.3	114.5	99.1	90.9	82.7	77.1	71.4	64.2	57.0	51.1	45.6	39.6	34.5	30.3	26.1	22.2	0.76	
104	1RB6	283.2	1,000.0	7.88	208.8	162.1	145.4	128.6	116.5	108.0	101.2	94.3	88.7	83.0	78.7	74.3	70.1	66.4	62.1	58.8	54.3	49.8	43.9	0.87	
105	1RB10	176.9	1,000.0	3.02	315.3	217.1	179.8	142.5	112.7	97.8	86.5	75.2	67.8	60.3	54.7	49.1	42.8	36.8	32.5	27.8	23.9	19.9	15.6	0.71	
106	1RC3A	1,329.2	2,373.5	24.33	364.1	259.5	201.2	142.9	113.8	94.2	85.4	72.6	63.7	54.8	49.1	43.4	39.5	35.9	33.3	30.2	26.7	23.2	20.0	0.64	
107	1RC5A	922.0	2,454.9	9.21	357.7	181.0	139.5	98.0	82.9	70.0	62.3	54.5	49.3	44.1	40.4	36.7	33.7	31.4	27.7	19.3	13.3	7.3	4.3	0.73	
108	1RC8A	1,236.0	1,800.0	18.39	242.5	194.4	169.8	145.2	129.5	113.8	102.5	91.2	83.7	76.2	70.5	64.8	60.7	56.8	53.1	48.8	36.1	23.4	15.0	0.87	
109	1RC10	1,029.8	2,356.4	17.92	234.9	195.8	176.8	157.7	141.0	128.8	117.9	107.0	94.0	80.9	72.1	63.2	53.6	46.8	39.5	34.2	29.9	25.5	22.7	0.85	
110	1RC12A	812.5	1,800.0	3.48	271.6	209.7	183.6	157.4	146.1	132.9	111.4	89.8	77.0	64.2	57.9	51.5	48.6	45.7	42.3	38.8	29.2	19.6	12.4	0.85	
111	1RD1A	342.5	1,344.2	41.48	284.2	229.8	195.0	160.1	138.6	122.8	106.5	90.1	77.9	65.7	56.8	47.9	39.8	34.2	29.3	23.3	17.8	12.2	6.7	0.71	
112	1RD2	1,120.1	2,126.2	9.74	428.1	270.0	195.9	121.8	104.4	88.2	72.6	57.0	47.6	38.1	32.1	26.0	22.3	19.0	16.0	13.5	10.5	7.4	4.6	0.72	
113	2K6A	937.0	700.0	6.09	438.1	368.4	319.6	270.7	135.3	45.5	26.5	7.4	3.8	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.21
114	2K7	32.9	715.3	0.65	563.4	256.2	157.5	58.7	27.8	10.8	5.4	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	0.72
115	2K11	44.7	800.5	12.92	748.4	307.5	200.3	93.0	48.1	24.7	14.6	4.4	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.30
116	2K15	17.8	650.0	1.74	649.8	242.3	158.6	74.8	38.0	18.4	10.7	2.9	2.1	1.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.57
117	2K16	18.7	674.5	4.02	554.6	273.8	180.3	86.7	47.0	25.8	15.2	4.5	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.35
118	2K20	54.8	720.1	0.61	498.6	105.9	57.9	9.8	1.6	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	0.67
119	2K40	76.7	750.0	3.26	578.5	272.4	177.7	82.9	53.4	35.0	22.9	10.8	5.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.28
120	2R1A	22.6	650.0	4.75	670.7	338.4	220.7	103.0	62.5	37.9	26.8	15.6	8.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.93
121	2R4	36.6	619.0	15.05	599.7	321.9	229.0	136.1	95.5	68.1	46.5	24.9	12.5	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.62
122	2R25	0.9	629.3	0.16	12.9	0.6	0.3	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	0.93
123	2R24	7.5	654.3	5.04	585.5	311.1	209.8	108.5	75.7	52.0	36.8	21.6	14.0	6.3	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.52
124	2R27	11.1	650.0	0.10	106.6	1.0	0.5	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	1.04
125	2R26	24.4	594.9	0.34	362.1	141.3	83.9	26.5	0.3	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	0.33
126	2R29	51.4	650.0	1.86	437.8	247.1	178.9	110.7	86.5	68.8	57.5	46.2	39.8	33.3	28.2	23.1	14.5	14.0	12.4	9.1	7.8	6.3	4.3	0.58	
127	3A2A	660.9	1,629.2	8.65	405.1	289.5	213.6	137.6	103.8	86.8	74.3	61.7	49.9	38.0	33.6	29.1	25.4	22.8	20.2	18.4	16.2	13.9	9.7	0.71	
128	3A4	329.4	1,068.2	1.24	365.7	233.7	182.5	131.3	99.1	73.3	58.4	43.5	35.9	28.2	24.2	20.1	16.1	12.9	10.5	8.9	4.9	0.8	0.1	0.62	
129	3A8	410.1	1,872.8	2.09	351.5	252.2	202.8	153.3	120.4	95.5	80.7	65.9	56.9	47.8	44.0	40.1	35.3	31.5	30.1	26.3	23.4	20.5	16.2	0.73	
130	3A16A	104.5	1,095.0	28.09	386.7	294.1	239.5	184.8	149.3	116.9	95.8	74.7	62.2	49.6	35.9	22.2	11.6	4.7	0.1	0.0	0.0	0.0	0.0	0.0	0.79
131	3A18	12.5	800.0	3.72	466.6	330.8	257.5	184.2	143.1	94.5	70.1	45.6	32.6	19.6	12.8	5.9	1.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.88
132	3B2	1,298.2	1,000.0	47.58	405.6	272.5	214.6	156.7	125.7	104.3	85.3	66.3	50.4	34.5	27.5	20.5	16.6	12.8	9.9	8.2	6.9	5.6	4.0	0.76	
133	3B8	174.1	1,100.0	0.52	450.3	225.1	162.1	99.0	67.9	48.5	36.9	25.2	19.4	13.6	10.7	7.8	5.8	3.9	3.9	1.9	1.1	0.2	0.0	0.35	
134	3B13	227.7	900.0																						

Table 2.1.1 Classification of Land Unit (1/5)

Land Unit	Description	Remarks	Class
CP1	Nearly level to gently undulating plain (slope range 0-2%) below 50m altitude, developed on Neogene and Quaternary limestones, sandstones, marls and sands.		2
CP2	As above, but developed mainly on coralline limestone.		2
CH1	Gently undulating to rolling plains and Plateaux (slope range 2-10%) developed on Neogene sandy clays, sandstones and other terrestrial sediments.		2
CH2	As above but developed on Jurassic and Cretaceous clays, shales, marls, sandstones.		2
CH3	Nearly level (slope range 0-1%) seasonally waterlogged plains developed on Neogene sandy clays		2
CH4	As above but developed on Neogene sediments capped by ironstone		2
CD1	Strongly dissected uplands (slope range 10-30%) developed on Neogene sandy clays	Steep slope	1
CD2	Strongly dissected, rolling to steep hills (slope range 15-45%) developed on Jurassic sandstones, shales and limestones	Steep slope	1
CD3	Low, steep hills developed on Paleogene limestones and marls	Steep slope	1
CF1	Flat plains regularly flooded from permanent rivers with varying flooding regime and sedimentation pattern		3
CF2	Flat delta plains regularly flooded from rivers with brackish water	Salinisation	1
CT	Flat to gently undulating plains developed on older alluvium no longer exposed to flooding from rivers		3
EA1	Flat alluvial plains with homogeneous sedimentation pattern, low altitude (500m)		3
EA2	Flat alluvial plains with complex sedimentation pattern, low altitude (500m)		(3)
EA2a	Alluvial fan complex		3
EA2b	Floodzone		2
EA2c	Older sandflats		3
EA3	Flat alluvial plains more or less affected by salinity, low altitude (500-750m)	Salinity	(1)
EA3a	Strongly affected	Salinity	1
EA3b	Less affected	Salinity	1
EA4	Strongly dissected depression composed of dissected ridges, fault scarps and alluvial plains, low to medium altitude (500-1000m)		(2)
EA4a	Mainly well drained parts		2
EA4b	Mainly poorly drained parts	Poorly drained	2
EF	Strongly dissected uplands and low hills transitional to high plateaux or mountains; low to medium altitude (500-1000m)		2
EH1	Strongly dissected terrain at medium altitude (1000-1500m), composed of steep rocky hills and sloping pediments (2-10%) developed on intermediate metamorphic rocks		2
EH2	As above, but with severe water erosion, sandy alluvial fans and sandy river valleys	Highly eroded and degraded	1
EI1	Steep granite inselbergs with moderately sloping footslopes (2.8%)		2
EI2	As above		2
EM1	Undulating to rolling footslopes (2-10%) of semi-arid areas, low to medium altitude (500-1000m)		2
EM2	Undulating to rolling footslopes (2-10%) of semi-humid areas; low to medium altitude (500-1000m)		2
EM3	As above		2
EM4	Very strongly dissected mountain plateaux with steep and very steep slopes (15-30%) and narrow valleys, strongly affected by soil creep, erosion and landslides; medium to high altitude (1000-2000m)	Steep slope	1
EM5	Dissected, rolling to hill mountain plateaux, slope range 10-40%, less affected by erosion; medium to high altitude (1000-2000m)	Dissected rolling to hilly terrain	1
EPa1	Mainly well drained, gently undulating to rolling plains and plateaux (slope range 2-10%, altitude 500-1200m) developed on intermediate gneisses.		2

Table 2.1.1 Classification of Land Unit (2/5)

Land Unit	Description	Remarks	Class
EPa2	Mainly poorly drained, flat and wide topographical depressions of semi-arid plains developed on young alluvium; low to medium altitude (500-1200m)		3
EPh1	Mainly well drained, undulating to rolling plains (2-10%) at low altitude (below 750m)		2
EPh2	As above		2
EPh3	Flat to rolling plains with or without inselbergs at low altitude (below 750m)		2
EPh4	Gently undulating plains (0-2%) at low altitude (below 750m)		2
EPh5	As for EPh3		2
EPh6	Dissected, undulating to rolling, locally hilly plains at medium altitude (750-1500m)		2
EPh7	Flat plains with poor surface drainage at low altitude (below 750m)		3
EPh8	Level to rolling plains, low altitude (below 750m)		3
HL	Flat to very gently undulating lacustrine plain formed by floodplains, alluvial fans, piedmonts and a delta developed on lake alluvium at low altitude (500m)		3
HM1	Mountains with steep, rocky outer slopes and undulating to hilly plateau crests, developed on granite, high altitude (1500-2100m)	Mountains with steep, rocky outer slopes	1
HM2	Mountains bounded by escarpments and transitional to high plateaux, with undulating to hilly plateau crests developed on gneissic rocks, high altitude (1500-2200m)	Mountains bounded by escarpments	1
HM3	Strongly dissected mountains with steep outer slopes, steep footslopes, broad or narrow valleys and limited plateau crests, high altitude (1500-2300m), strongly susceptible to erosion and landslides	Strongly dissected mountains with steep slopes	1
HM4	Flat top undulating intramontane plains, medium to high altitude (1500-1800m), humid regions		3
HM5	Flat to rolling intramontane plains, medium altitude (1400-1600m), semi-arid regions		3
HP1	Undulating to rolling plains and plateaux at high altitude (1500-2100m) developed on granite		2
HP2	Flat to undulating plains and plateaux at high altitude (1500-2200m) developed on gneiss		2
HP3	Undulating to rolling plains and plateaux at high altitude (1800-2400m) with mountaineous ridges and steep-sided valleys developed on basement complex rocks covered by volcanic ash		2
HP4	Undulating plateau at very high altitude (2300-2700m) with steep valleys developed on volcanic ashes and pumice, covering basement complex and volcanic rocks		2
HP5	Undulating plateau at medium to high altitude (1200-1600m) developed on gneissic rocks, partially covered by volcanic ash		2
HP6	Undulating plain at medium altitude (1200-1400m) with broad valleys and occasional inselbergs with footslopes, developed on gneissic rocks, not covered by volcanic ash		2
HU1	Steep hills with steep ridges and footslopes, and moderate valley slopes, developed on basement complex rocks, medium to low altitude (1500-700m), usually with shallow soils		2
HU2	Rolling to hilly rift benches, plateaux and plains developed on intermediate and basic crystalline rocks, medium to high altitude (1300-1800m)		2
HV1	Volcanic mountains with caldera and rolling to hilly plains developed on basalt covered by volcanic ash; high altitude (1800-2300m)	Mountains	1
HV2	Complex of undulating to hilly lava plains and plateaux, covered by volcanic ash, often separated by escarpments, medium to high altitude (1200-1800m)		2
NA1	Complex of undulating upland plains and flat lowland plains at medium to high altitude (1150-1800m), developed on sodic volcanic ash	Salinization	1
NA2	Level to undulating or rolling plains at medium to high altitude (1300-2000m) developed on weathered volcanic ash		3

Table 2.1.1 Classification of Land Unit (3/5)

Land Unit	Description	Remarks	Class
NA3	Level to rolling plains at medium to high altitude (1300-1800m) with granite 'kopjes' developed on slightly weathered volcanic ash		3
NA4	Complex of steep hills developed on metamorphic rocks with nearly level to rolling plains and plateaux developed on volcanic ash and sediments, high altitude (1800-2300m)		2
NA5	Stabilized dunes	Sand dunes	1
NA6	Flat to undulating plains, medium altitude (1300-1600m) developed on volcanic ash and sediments		3
NA7	Undulating to rolling plains, medium altitude (1500-1700m) developed on volcanic ash		3
NA8	As above, with common lava outcrops		2
NA9	Undulating to rolling plains with explosion craters, medium altitude (1200-1600m)		2
NC1	Rolling to hilly, high-altitude plateau (1800-2500m) with calderas and volcanic cones		2
NC2	Steep ash and lava slopes	Steep ash and lava slopes	1
NP1	Rolling to hilly, strongly dissected plateaux, high altitude (1500-2400m) developed on gneisses	Rolling to hilly, strongly dissected	1
NP2	Hilly, very strongly dissected plateaux, high altitude (1500-2200m) developed on gneisses	Hilly, very strongly dissected plateaux	1
NP3	Rolling to hilly, dissected plateaux, medium to high altitude (1300-1800m) developed on volcanic ash, lavas and tuffs	Rolling to hilly, dissected plateau	1
NP4	Undulating to rolling plateaux and plains of medium to high altitude (1500-1800m) developed on lavas and granites	Undulating to rolling plateaux	1
NR1	Flat plains at medium altitude (900-1100m) with extensive salt or soda flats often seasonally inundated from lakes	Salinity	1
NR2	Flat plains at medium altitude (900-1100m) formed on old lake sediments, influenced by volcanic ash		2
NR3	Flat lowland plains at medium altitude (900-1100m) without external drainage, seasonally waterlogged or inundated		2
NV1	Stony and sandy, undulating to rolling outwash plains, medium altitude	Stony/sandy undulating to rolling outwash plains	1
NV2	Stony, flat lava and lahar plains	Stony, flat lava and lahar plains	1
NV3	Gentle to steep ash slopes :		(2)
NV3a	a) Medium altitude (1200-1600m)		2
NV3b	b) High altitude (1600-2000m)		2
NV3c	c) Very high altitude (2000 - 3500m)		2
PC1	Complex of rocky hills, steep valleys and escarpments associated with undulating plains and plateaux developed on sandstones and shales; medium altitude		2
PC2	Complex of rocky hills, valleys and undulating plateaux and plains developed on metamorphic rocks; medium altitude		2
PC3	Cuesta-plateau on sandstones composed of gently undulating plateaux, steep escarpments, piedmonts, valleys and rocky hills; medium altitude		2
PC4	Complex of very gently undulating plains with steep hills developed on sandstones, siltstones and conglomerates; medium altitude		2
PH1	Rocky hills with gentle to steep footslopes (2-16%) developed on granitic or gneissic rocks	Steep slope and rocky hill	1
PH2	As above	Steep slope	1
PH3	As above, footslopes strongly affected by soil erosion and degradation	Highly eroded and degraded	1
PH4	High, steep rocky banded ironstone hills with very gentle to undulating footslopes (1-8%) developed on basic metamorphic rocks associated with banded ironstones		2
PH5	Strongly dissected, undulating to rolling plains, medium to high altitude (1000-1700m) with steep valley slopes, formed on gneissic rocks with basic inclusions	Strongly dissected	1
PM1	Very gently undulating plains with moderately steep escarpments (6-12%) developed on metamorphic rocks, medium altitude (1200m)		2
PM2	As above, medium to high altitude (1000-1600m)		2

Table 2.1.1 Classification of Land Unit (4/5)

Land Unit	Description	Remarks	Class
PR	Flat plains regularly flooded from permanent river, medium altitude		2
PS	Flat plains at medium altitude (900m) developed mainly on alluvium		3
PSa	Marginal flats		2
PSb	Semi-permanent swamp		2
PPp1	Flat seasonally inundated, lowland ('mbuga') plains developed on young alluvium; medium altitude (900-1200m)		2
PPp2	As above		2
PPp3	Permanent and semi-permanent swamp		2
PPS1	Almost flat (0-1%) plains developed on old alluvium or colluvium		3
PPS2	Flat plains developed on old alluvium		3
PPS3	Flat to gently undulating plains (0-3%) developed partly on granite, partly on old colluvium and alluvium; medium altitude (1000-1200m)		3
PPW1	Mainly gently undulating, slopes 1-3%, with or without hill-footslope associations, slopes 3-8%, developed on granites; medium altitude (1100-1300m)		2
PPW2	Mainly gently undulating plains, slopes 1-3%, developed on basic metamorphic rocks associated with banded ironstones, medium altitude (1100-1200m)		2
PPW3	Mainly gently undulating plains, slopes 1-3%, developed on intermediate gneisses, medium altitude (1100-1300m)		2
PPW4	Mainly very gently undulating plains, slopes 0-1%, developed on old lake sediments, medium altitude (1000-1100m)		3
PPW5	Cuesta-plateau developed on sandstones, shales and quartzites formed by gently undulating plains and plateaux broken by steep escarpments with gentle footslopes and incised valleys; medium to high altitude (1000-1800m)		2
PPW6	(Very) gently undulating outwash plain (0-1%) developed on old alluvium formed from erosion of adjacent sandstone plateau and on granitic and gneissic rocks with occasional hill-footslope associations; medium altitude (800-1200m)		2
PPW7	Flat to gently undulating outwash plains developed on old alluvium formed from erosion of adjacent granite uplands; medium altitude (1100-1200m)		2
PPW8	Gently undulating plains and plateau remnants (1-3% slopes) formed on very old, mainly indurated sediments ('continental deposits') overlying granite; medium altitude (1100-1400m)		2
RA1	Flat plains covered by riverine alluvium over clayey lake beds, often affected by salinity or sodicity; medium altitude (900-1200m, mostly below 1000m)		2
RA2	Flat plains covered by riverine and lacustrine alluvium, strongly affected by salinity or sodicity; medium altitude (800-1200m, mostly below 1000m)	Salinization	1
RA3	Flat plains covered by riverine alluvium and regularly flooded, with homogeneous sedimentation pattern; medium altitude (800-1000m)		2
RA4	As above, with complex sedimentation pattern		3
RA5	Flat to very undulating plains formed by alluvial fans, levees, piedmonts and tributary floodplains; medium altitude (1000m)		3
RA6	Flat plains formed by a complex of floodplains, lacustrine plains and piedmont plains; medium altitude (1000m)		3
RP1	Flat to gently undulating plain, medium altitude (800-1200m) developed on metamorphic rocks		2
RP2	Undulating plains formed on very old surfaces on mainly indurated deposits underlain by crystalline rocks; medium altitude (1200-1400m)		2
RP3	(Gently) undulating piedmont plains transitional between alluvial flats and highlands, formed on granites; medium altitude (1200-1600m)		2
SD	Mainly strongly dissected terrain, composed of table-topped ridges, steep valley slopes, rolling interflaves and narrow or broad river valleys; low altitude (generally below 750m); developed on Karroo sandstones		2

Table 2.1.1 Classification of Land Unit (5/5)

Land Unit	Description	Remarks	Class
SU	Mainly gently undulating to rolling plateaux developed on Karroo sandstones and Neogene sandy sediments; low altitude (generally below 750m)		2
U1	Flat to very gently undulating plains of high altitude (1400-2000m) developed on gneisses and schists		2
U2	Very gently undulating plains of medium altitude (800-1600m) developed on sandstones		2
U3	Complex gently undulating plains and plateaux with steep hills, footslopes and valleys, developed on schists, acid volcanics, gneisses and sandstones at high altitude (1600-2300m)		2
U4	As above, at medium altitude (1200-1700m)		2
U5	Complex of gently undulating plains with steep hills and dissected valleys developed on granite, high altitude (1500-2000m)		2
U6	Flat to very gently undulating riverine plains of medium altitude (1400-1800m) composed of river terraces, alluvial fans, floodplains, swamps and interfluves		2
W1	Dissected, hilly plateaux developed on basalts with flat or gently undulating tablelands bounded by steep scarps or velleys; often strongly affected by soil erosion; high altitude (1500-1700)	Steep slope	1
W2	Dissected, hilly plateaux developed on argillaceous sandstones and shales with flat or gently undulating tablelands with steep valleys, high altitude (1500-1700)	Steep slope	1
W3	Strongly dissected hills formed by parallel ridges of sandstone and quartzite, and deep, broad or narrow valleys, mainly developed on phyllites, often with permanent swamps, high altitude (1300-1800m)		2
W4	Undulating to rolling plains developed on phyllites with protruding ridges of resistant quartzite, often capped by ironstone; medium altitude (1400-1500m)		2
W5	Flat to gently undulating valley developed on alluvium and colluvium derived from phyllites; medium altitude (1150-1300m)		3
W6	Undulating to rolling plains and plateaux with resistant quartzite ridges often broken by steep escarpments, developed on sandstones; medium altitude (1200-1600m)		2
W7	Dissected, hilly plateaux formed by parallel ridges and intervening narrow valleys, developed on sandstones; medium altitude (1200-1600m)	Steep slope	1
W8	Flat alluvial plain regularly flooded from permanent river		2
W9	Permanent swamp	Permanent swamp	1

Note: 3=Highly Suitable, 2=Moderately Suitable, 1=Marginal

Source: JICA Study Team

Table 2.2.1 Soil Type and Suitability Classification

Soil Type	Key Soil Properties	Suitability Class
Mollic Andosols	Soils in volcanic materials. They have excellent internal drainage and high aggregate stability, thus less susceptible to erosion. These soils have high natural fertility.	Highly suitable
Umbric Andosols		
Vitric Andosols		
Haplic Acrisols	Strongly weathered acid soils with a low base saturation. Such soils are most common in old land surfaces with a hilly or undulating topography. Aluminium toxicity and susceptibility to soil erosion pose severe limitation to cropping.	Moderately suitable
Umbric Acrisols		
Cambic Arenosols	Very permeable soils, their saturated hydraulic conductivity varies with the packing density of the sand, in arid regions such soils require irrigation for good production, many of them are unfit for surface irrigation due to high percolation losses.	Moderately suitable
Dystric Calcisols	Dryness, and in places also stoniness and/or the presence of petro-calcic horizon limit the suitability of these soils for agriculture. Irrigation can enhance salinization due to the impermeable petro-calcic horizon.	Marginal
Chromic Cambisols	Have a good structural stability, a high porosity, a good water holding capacity and good internal drainage. The soils are fertile.	Moderately suitable
Ferralic Cambisols	Moderately developed soils. Shallowness and stoniness are characteristic features. These soils make good agricultural land.	Moderately suitable
Chernozems	Black soil rich in organic matter, mostly eolian sediments (loess), such soils are found on flat to undulating plains, the high natural fertility and favourable topography permit arable cropping with supplementary irrigation during the dry season.	Highly suitable
Haplic Ferralsols	Strongly weathered soil with good physical properties and poor chemical fertility.	Moderately suitable
Rhodic Ferralsols		
Eutric Fluvisols	Young alluvial soils, stratified with a weak soil structure. They receive fresh sediment during regular floods. These soils are commonly found along rivers and lakes, in deltaic areas, and in areas with recent marine deposit.	Highly suitable
Mollic Fluvisols	Soils developed in alluvial deposits. Periodically flooded areas in alluvial plains, valleys and marshes. The soils have high natural fertility.	Highly suitable
Fluvic Histosols	Soils having 40 cm or more organic soil materials. These soils are confined to poorly drained basins and depressions, and if well drained they can permit the cultivation of crops.	Moderately suitable
Eutric Leptosols	Soils which are less than 30 cm deep by a continuous hard rock or highly calcareous material or a continuous cemented layer within 30 cm of the surface.	Moderately suitable
Lithic Leptosols	Soils which are limited in depth by continuous hard rock within 10 cm of the surface. Irrigation can enhance soil erosion.	Moderately suitable
Haplic Lixisols	Strongly weathered soil with low aggregate stability, thus becoming susceptible to water erosion.	Moderately suitable
Chromic Luvisols	Chromic Luvisols are fertile soils suitable for agricultural uses. However, Luvisols on steep slopes require erosion control measures. Most Luvisols are well drained.	Moderately suitable
Haplic Luvisols	Have favourable physical properties. Fertile soils suitable for a wide range of agricultural uses.	Moderately suitable
Haplic Nitisols	Most productive soils. The deep and porous solum permits deep rooting. Stable soil structure make the soil less susceptible to erosion.	Moderately suitable
Umbric Nitisols		
Haplic Phaeozems	Dark soils rich in organic matter. Fertile soils. However, water and wind erosion are serious hazards.	Moderately suitable
Luvic Phaeozems		
Eutric Planosols	Soils with an eluvial horizon abruptly over a dense sub-soil (impervious), typically in seasonally waterlogged flat lands. Soils are developed from clayey alluvial and colluvial deposit.	Moderately suitable
Gleyic Solonetz	Saline soils, and most common in seasonally or permanently waterlogged areas.	Marginal
Haplic Solonetz		
Mollic Solonetz		
Sodic Solonchak		
Eutric Vertisols	Heavy clay soils developed from sediments that are finely textured. They have poor internal drainage, and are commonly found on depressions and level to undulating areas. Vertisols are productive soils if properly managed.	Highly suitable

Source: JICA Study Team

Table 2.3.1 Classification of Land Cover and Implied Land Use

Land Cover Type	Sub-Type	Code	Implied Land Use
Forest	Natural Forest	Fn	Conservation, Logging
	Mangrove	Fm	MFPs, Fish Farming
	Plantation	Fp	Commercial Forestry
Woodland	Woodland (unspecified density)	Wu	Wood Gathering &
	Closed Woodland	Wc	Bee-Keeping &
	Open Woodland	Wo	Hunting/Recreation
	Woodland with scattered cropland	Wsc	Above & Shifting Farming
Bushland	Bushland (unspecified density)	Bu	Hunting/Recreation
	Dense Bushland	Bd	And Grazing, otherwise
	Open Bushland	Bo	All as for Woodland
	Bushland with scattered cultivation	Bsc	Above and Shifting Farming
	Bushland with emergent trees	B(et)	
	Thicket	Bt	None observed
	Thicket with emergent trees	Bt(et)	None observed
Grassland	Wooded Grassland	Gw	
	Bushed Grassland	Gb	For all these subtypes,
	Open Grassland	Go	Land use mostly confined to
	Grassland with scattered cropland	Gsc	Grazing (in Tse-tse free areas)
	Wooded Grassland (seasonally inundated)	Gws	plus Wood Gathering
	Bushed Grassland (seasonally inundated)	Gbs	
	Open Grassland (seasonally inundated)	Gos	Cropping on residual waters
Cultivated Land	Mixed Cropping	Cm	Grain, vegetables, Fruit
	Cultivation with tree crops	Cte	Coconut, Mango, Cashew
	Cultivation with tree crops (& shade trees)	Ctc(st)	Coffee
	Cultivation with bushy crops	Cbc	Tea, Cotton, Cloves
	Cultivation with herbaceous crops	Chc	Maize, Wheat, Rice, Bananas
Open Land	Bare Soil	BSL	Residual Grazing
	Salt Crusts	SC	Mining for Salt
	Rock Outcrops	RO	Recreation
	Ice-cap/Snow	ICE	Recreation
Water Features	Ocean	Ocean	Fishing and Recreation
	Inland Water	IW	Fishing and Recreation
	Swamp/Marsh (Permanent)	S/M	Aquaculture
Others	Urban Area/Airfields		Residence/Industrial

(Source: National Reconnaissance Level Land Use and Natural Resources Mapping Project, November 1997)

Table 2.3.2 Distribution of Land Cover and Protected Area in each District (1/4)

Region	Arusha										Coast					DSM			Dodoma					
	Districts	Arusha	Arusha	Babai	Hlong	Karuu	Kiteo	Mbuhu	Monduli	Ngorongoro	Simanjiro	Begamoyo	Kibaha	Kisarawe	Mafia	Mkurungu	Rufiji	Ilala	Kinondoni	Temeke	Dodoma	Kongwa	Kondoa	Mpungwa
Land Cover	Ft	-	0	23,334	5,895	-	15,070	65,697	65,637	101,670	3,429	793	5,453	20,483	3,756	-	24,309	608	1,498	100	1,017	-	1,267	17,406
	Fm	-	0	0	0	-	0	0	0	0	0	4,143	0	5,038	3,820	-	49,300	0	266	4,050	0	-	0	0
	Fp	-	0	0	0	-	0	45	6,796	0	0	2,489	4,169	0	0	-	76	0	0	0	0	-	134	150
	Total	-	0	23,334	5,895	-	15,070	65,742	72,433	101,670	3,429	7,425	9,622	25,521	7,576	-	73,685	608	1,764	4,150	1,017	-	1,401	17,565
	Wu	-	0	0	0	-	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0
	Wc	-	0	3,330	0	-	60,390	5,406	1,220	6,222	57,738	52,706	9,782	197,000	1,981	-	209,051	0	151	279	53,596	-	33,771	24,620
	Wo	-	0	15,221	56,872	-	257,913	146,561	55,292	182,074	511,235	207,965	10,892	61,840	427	-	335,147	0	2,541	141,134	0	-	265,907	224,422
	Wsc	-	0	22,517	88,163	-	123,166	23,725	762	6,255	221,336	102,234	12,052	122,181	9,559	-	64,596	3,139	749	5,184	158,073	-	137,665	191,914
	Total	-	0	41,068	145,035	-	441,469	175,692	57,274	194,551	790,309	362,905	32,726	381,021	11,967	-	608,794	3,139	900	8,004	352,803	-	437,343	440,956
	Bu	-	0	0	0	-	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0
	Bd	-	0	1,484	0	-	438	1,938	128,088	32,412	35,982	0	0	0	0	-	16,438	0	0	0	42,347	-	10,867	5,399
	Bo	-	0	143	0	-	3,493	1,205	148,650	100,966	27,464	1,373	0	0	0	-	22	0	0	0	104,363	-	18,237	245
	Bsc	-	0	74,646	63,128	-	134,842	205,535	52,727	14,976	132,149	143,603	58,145	47,812	536	-	22,883	0	3,691	8,056	674,898	-	466,826	218,419
	B(et)	-	0	11,628	8,466	-	309,772	38,908	260,433	105,899	354,860	113,563	1,469	21,984	0	-	0	3	4,012	0	58,429	-	56,895	45,620
	Bl	-	0	181	5,929	-	9,389	0	439	0	0	949	0	0	0	-	0	0	0	21,499	-	22,466	566	
	B(et)	-	0	0	1,982	-	39,591	3,612	0	10,602	136,650	3,263	24,135	18,544	0	-	57,246	0	353	0	670	-	10,989	10,730
	Total	-	0	88,082	79,503	-	517,525	251,198	590,337	264,855	687,305	262,751	83,750	88,340	536	-	96,589	3	8,056	8,056	902,206	-	586,280	280,979
	Cw	-	0	72,378	228	-	40,869	3,056	90,988	57,009	140,952	12,904	10	54,454	18	-	106,061	0	0	0	19,492	-	40,708	228
	Gd	-	0	37,026	1,024	-	9,206	18,215	226,646	101,795	163,325	21,454	6,433	4,456	162	-	10,789	0	0	0	2,212	-	4,684	14,191
	Go	-	0	5,967	374	-	774	3,083	259,085	671,149	15,276	676	0	177	0	-	2,325	0	0	0	5,024	-	2,227	3,425
	Gsc	-	0	74,793	46,745	-	76,734	72,716	117,290	34,004	47,393	25,157	1,235	63,432	203	-	192,630	32	6,025	25,462	142,566	-	75,330	290,444
	Gws	-	0	3,335	0	-	13,950	2,552	667	1,684	6,339	1,127	0	38,302	0	-	71,504	0	0	0	17,402	-	4,741	3,796
	Gbs	-	0	31,997	90	-	25,210	12,720	49,783	16,982	60,516	4,732	0	4,780	1,365	-	4,515	0	0	501	91,919	-	30,446	9,289
Gos	-	0	18,289	3,427	-	25,173	14,702	47,956	23,002	40,714	334	0	5,729	0	-	22,051	0	0	0	57,435	-	54,293	12,568	
Total	-	0	243,785	51,888	-	191,916	127,044	792,415	905,625	474,515	66,384	7,678	171,320	1,748	-	409,875	32	6,025	25,963	336,440	-	212,429	362,988	
Cm	-	662	16,272	26,161	-	68,530	26,684	147,207	2,708	16,189	51,251	13,044	14,907	5,169	-	9,445	10,145	29,973	18,041	81,586	-	97,139	32,076	
Ctc	-	0	0	0	-	0	0	0	0	0	85,068	38,913	76,491	19,074	-	45,068	12,311	0	1,324	0	-	0	0	
Ctc(st)	-	3,812	4,910	0	-	0	0	19,253	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0	
Cbc	-	0	0	0	-	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0	
Cbc	-	3,595	75,704	61,685	-	0	30,740	117,124	0	60,672	20,559	11,077	4,169	0	-	7,728	0	0	0	1,277	-	17,400	4,848	
Total	-	8,069	96,886	87,846	-	68,530	57,424	283,584	2,708	76,861	156,878	63,034	95,567	24,243	-	62,241	22,456	29,973	19,375	82,863	-	114,539	36,924	
BSL	-	0	0	0	-	0	5,858	1,904	12,999	0	1,203	0	151	9,997	-	8,444	0	0	1,666	0	-	3,137	63	
SC	-	0	0	0	-	0	0	0	0	0	1,076	0	526	0	-	0	0	349	0	0	-	0	0	
RO	-	0	0	0	-	0	0	168	0	0	0	0	0	0	-	0	0	0	0	72	-	0	0	
ICE	-	0	0	0	-	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0	
Total	-	0	0	0	-	0	5,858	2,072	12,999	0	2,279	0	677	9,997	-	8,444	0	349	1,666	72	-	3,137	63	
Ocean	-	0	0	0	-	0	0	0	0	0	0	0	0	0	-	0	2,118	10,517	7,770	0	-	0	0	
IW	-	0	43,573	4,610	-	102	116,506	57,249	21,161	6,187	22	28	1,350	0	-	16,279	0	0	0	24,479	-	349	1,990	
S/M	-	0	4,094	1,687	-	11,956	15,052	10,349	7,710	15,036	0	25	9,657	0	-	22,564	0	0	0	5,962	-	8,268	65	
Total	-	0	47,667	6,297	-	12,058	131,358	67,598	28,871	21,223	22	53	11,007	0	-	38,843	2,118	10,917	7,770	30,441	-	8,617	2,055	
Urban	-	2,282	0	0	-	473	140	579	73	209	968	494	415	222	-	541	2,943	5,806	3,591	2,305	-	487	978	
Total	-	2,282	0	0	-	473	140	579	73	209	968	494	415	222	-	541	2,943	5,806	3,591	2,305	-	487	978	
G.Total	-	10,331	540,822	376,466	-	1,247,041	814,456	1,866,292	1,511,352	2,053,651	859,612	197,357	773,878	56,289	-	1,299,012	31,259	63,790	78,575	1,708,147	-	1,364,233	1,142,508	
Protected Area	Forest R.	44,632	2,222	24,493	5,889	29,442	0	22,133	43,528	90,109	0	66,954	11,353	38,530	0	4,425	120,686	0	0	0	64,778	0	68,205	0
	Game R.	28,414	187	0	0	0	0	0	0	0	0	14,256	0	37,582	0	254,543	0	1,247	0	0	0	112,278	0	
	N. Parks	11,240	0	175,678	0	9,126	0	21,547	0	0	0	0	0	0	0	0	0	0	0	0	0	87,876	0	
	C. Areas	0	0	0	0	0	0	0	18,429	892,526	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	84,286	2,409	200,171	5,889	38,568	0	22,133	83,505	892,635	0	81,210	11,353	75,922	0	4,425	375,229	0	1,247	0	64,778	0	268,360	0
(%)	-	23.3	37.0	1.6	-	0.0	2.7	4.4	59.1	0.0	9.4	5.8	9.8	0.0	-	28.9	0.0	2.0	0.0	3.8	-	19.7	0.0	

(Source: National Reconnaissance Level Land Use and Natural Resources Mapping Project, November 1997)

Table 2.3.2 Distribution of Land Cover and Protected Area in each District (2/4)

Region	Irunga					Kagera					Kigoma			Kilimanjaro					Lindi					
	Districts	Irunga	Ludewa	Makete	Mufindi	Njoabe	Bukoba	Biharamulo	Karugwe	Muleba	Ngara	Kaatu	Kibondo	Kigoma	Hai	Moshi	Mwanga	Rombo	Seme	Kilwa	Lindi	Liwale	Nachingwea	Ruangwa
Land Cover	Fn	119,316	26,193	10,217	99,559	182,459	38,491	6,843	18,183	1,316	264	0	0	26,334	42,199	16,424	23,987	33,262	22,658	2,826	54,237	5,967	587	-
	Fm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28,421	10,722	0	0	-
Land Cover	Fp	875	1,087	0	52,500	21,059	436	0	0	0	0	0	0	0	4,333	0	0	8,239	0	0	2,604	0	0	-
	Total	120,191	27,280	10,217	152,059	203,518	38,927	6,843	18,183	1,316	264	0	0	26,334	46,532	16,424	23,987	41,501	22,658	31,247	67,563	5,967	587	-
Land Cover	Wu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
	Wc	39,795	64,231	4,865	12,773	9,541	179	121,635	0	3,764	4,079	61,672	330,478	300,377	0	0	0	0	0	255,010	85,711	175,193	6,345	-
Land Cover	Wo	614,386	53,414	57,595	49,128	79,385	3,016	154,405	22,894	28,272	28,259	209,822	365,728	461,763	0	120	0	9	115,629	328,220	94,584	2,129,180	112,559	-
	Wac	138,659	50,656	65,317	182,993	128,039	43,299	103,279	76,774	12,009	27,809	127,386	96,384	89,200	0	1,010	18,874	0	10,222	142,323	297,601	150,677	71,255	-
Land Cover	Total	792,840	168,301	127,777	244,894	216,965	46,494	359,319	99,668	44,045	60,147	398,880	792,590	851,340	0	1,130	18,874	9	125,851	725,553	477,896	2,455,050	190,159	-
	Bu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Land Cover	Ed	40,996	0	0	0	0	2,773	1,197	0	0	0	0	0	4,496	18,321	8,331	0	50,823	5,037	139	0	20,343	316	-
	Bo	105,253	0	5,701	0	1,259	0	0	0	0	0	0	0	5,617	26,590	0	3,031	0	24,210	0	0	7,709	12,427	-
Land Cover	Bac	380,648	159,534	66,892	179,916	271,044	94,741	40,716	89,725	20,047	30,022	124,345	90,066	68,759	0	4,120	27,551	7,646	14,657	108,820	159,061	24,862	132,798	-
	B(c)	385,230	43,850	1,341	0	7,935	12,857	23,662	124,111	25,250	71,656	25,767	20,498	172,568	0	0	60,571	0	199,884	77,892	8,915	243,167	254,818	-
Land Cover	Bt	1,079	0	0	0	0	0	0	0	0	0	0	0	2,935	102	0	0	0	0	299	0	313	0	-
	Bt(c)	13,673	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16,611	12,209	1,045	180,547	0	-
Land Cover	Total	926,870	203,284	73,934	179,916	280,229	100,371	273,572	213,836	45,297	101,678	150,112	113,499	251,842	44,911	12,451	91,153	58,469	260,399	199,369	169,021	476,941	400,359	-
	Gw	228,197	20,685	34,274	14,860	291	11,681	30,927	44,788	8,791	29,959	11,460	20,028	22,962	0	10,790	0	12,684	133,920	27,038	524,550	4,376	-	-
Land Cover	Gb	104,646	32,828	16,121	11,234	11,923	55,421	33,057	100,337	1,739	513	8,022	29,921	2,344	16,952	42	14,304	189	28,246	78,566	474	55,657	3,148	-
	Go	4,019	5,360	28,558	1,157	7,298	690	1,680	919	1,715	0	252	5,922	1,854	336	0	0	685	703	624	81	388	335	-
Land Cover	Gsc	297,341	97,183	53,585	169,374	258,043	12,770	545	3,550	3,240	3,158	33,282	6,951	24,728	989	5,720	683	0	6,756	24,162	17,829	770	0	-
	Gws	43,711	0	0	1,759	0	19,947	33,431	0	0	0	80,334	164,839	116,225	0	0	0	0	0	49,560	3,053	126,760	16,246	-
Land Cover	Oba	11,097	0	0	1,353	2,102	26,110	25,028	526	0	5,921	78,018	261,495	24,178	4,619	0	1,086	0	83,378	12,490	4,242	88,192	3,154	-
	Gas	35,206	516	0	17,932	2,771	9,898	19,889	1,832	1,330	732	6,411	44,243	2,586	0	7,883	2,446	0	6,514	5,385	2,277	19,890	127	-
Land Cover	Total	794,217	156,572	132,538	217,689	282,528	136,517	144,557	151,952	16,815	40,283	217,779	533,399	194,877	32,896	13,645	29,309	874	138,281	304,707	54,994	816,197	27,586	-
	Cm	36,836	43,121	82,420	38,230	96,012	167,579	159,822	43,502	90,421	113,089	35,982	26,335	56,398	54,299	32,988	7,609	29,078	49,474	21,846	29,607	19,189	7,995	-
Land Cover	Cte	0	1,521	0	0	19,673	0	0	0	0	0	196	0	5,002	0	0	0	0	47,413	109,316	1,882	13,740	0	-
	Ct(c)	0	0	0	1,468	0	0	0	0	316	0	0	0	0	15,446	37,203	0	16,547	0	0	0	0	0	-
Land Cover	Cbc	0	351	0	16,885	7,156	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
	Chc	15	0	0	0	0	57,777	26,482	144,511	31,979	29,338	0	506	25,025	28,368	16,919	0	13,810	0	21,303	0	0	0	-
Land Cover	Total	36,851	44,993	82,420	56,583	122,843	225,356	186,304	188,013	122,716	142,427	36,178	26,335	61,906	94,770	98,559	24,528	45,623	63,284	69,259	160,226	22,071	23,535	-
	BSL	690	0	0	0	0	64	0	0	0	0	0	748	0	0	0	0	0	3,928	2,772	9,214	0	0	-
Land Cover	SC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
	RO	0	0	0	0	0	0	0	0	0	0	0	289	0	0	0	0	0	0	0	0	64	1,343	-
Land Cover	ICE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,552	0	0	0	0	0	0	-
	Total	690	0	0	0	0	64	0	0	0	0	0	1,037	0	0	0	1,552	0	3,928	2,772	9,278	1,343	0	-
Land Cover	Ocean	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
	IW	7,442	0	0	4,001	1,344	556,966	39,324	25,232	456,870	0	69	80	798,308	0	0	7,784	388	1,310	238	1,118	7,930	0	-
Land Cover	SM	4,982	0	331	2,827	155	16,816	13,032	37,704	7,386	4,941	36,675	55,184	54,099	3,441	8,210	4,690	0	5,538	291	524	12,768	0	-
	Total	12,424	0	331	6,828	1,499	573,782	52,356	62,936	464,256	4,941	36,744	55,264	852,407	3,441	8,210	12,474	388	6,848	529	1,642	20,698	0	-
Land Cover	Urban	881	0	0	764	843	926	510	353	139	121	211	158	2,079	461	2,321	69	262	307	158	518	329	697	-
	Total	881	0	0	764	843	926	510	353	139	121	211	158	2,079	461	2,321	69	262	307	158	518	329	697	-
Land Cover	C.Total	2,684,964	600,530	427,217	858,724	1,108,425	1,122,437	1,023,466	734,941	694,584	349,861	839,904	1,521,245	2,241,322	212,966	152,740	200,394	148,680	617,628	1,334,750	934,632	3,805,531	642,266	-
	Forest R.	280,496	6,693	44,159	142,156	11,664	390,780	311,508	0	32,631	0	191,835	548,627	179,479	45,374	21,667	4,591	45,600	25,423	215,001	589,228	303,828	26,577	1,245
Protected Area	Game R.	0	0	0	0	0	95,586	41,468	14,738	0	0	823,479	0	0	0	0	0	191,111	0	0	1,962,609	0	0	
	N.Parks	160,725	0	0	0	0	0	0	0	0	0	156,316	13,268	5,378	0	37,468	0	0	0	0	0	0	0	
Protected Area	C. Areas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	441,221	6,693	44,159	142,156	11,664	390,780	407,094	41,468	47,369	0	191,835	1,372,106	335,795	58,642	27,045	4,531	83,068	216,534	215,001	589,228	2,266,437	26,577	1,245
Protected Area	(%)	16.4	1.1	10.3	16.6	1.1	34.8	39.8	5.6	6.8	0.0	22.8	90.2	15.0	27.5	17.7	2.3	55.9	35.1	16.1	63.0	59.6	4.1	-

(Source: National Reconnaissance Level Land Use and Natural Resources Mapping Project, November 1997)

Table 2.3.2 Distribution of Land Cover and Protected Area in each District (4/4)

Region	Ruvuma			Rukwa			Shinyanga					Singida			Tabora				Tanga									
	Districts	Mbinga	Songea	Tunduru	Mpanda	Nkasi	Sumbawanga	Barotsi	Bukombe	Kahama	Moshi	Muswa	Shinyanga	Iramba	Mwayoni	Sigida	Ijamba	Nzega	Sikonge	Tabora	Uruwo	Hadzani	Kerogwa	Lushoto	Mbeza	Pangani	Tanga	
Land Cover	Fa	917	207,026	0	9,914	1,081	7,133	0	0	2,712	0	0	0	0	0	0	0	0	0	0	0	34,125	17,460	55,626	28,972	4,503	0	
	Fm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	302	0	0	8,718	7,830	3,242	
	Fp	418	2,102	0	0	0	377	53	0	0	0	0	0	198	0	1,009	633	0	0	0	0	0	384	6,624	3,650	0	0	
	Total	1,335	209,128	0	9,914	1,081	7,510	53	0	2,712	0	0	0	198	0	1,009	633	0	0	0	0	0	34,427	17,844	62,250	41,340	12,333	3,242
	Wu	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
	Wc	151,493	439,865	322,675	559,006	245,671	92,359	0	0	193,793	16,472	0	0	32,898	2,017	48,662	0	60,491	0	94,887	287,825	189,873	8,005	15,923	27,261	6,995	0	
	Wo	59,207	1,199,032	536,571	2,531,169	175,911	177,684	729	0	523,944	155,090	406	6,650	119,610	1,460,352	284,347	81,974	87,559	0	2,211,577	912,310	510,401	42,510	85,618	76,785	38,799	231	
	Wsc	99,613	451,298	191,897	106,578	62,221	219,291	9,623	0	271,727	14,169	7,452	21,476	87,200	24,999	92,564	50,588	55,545	0	350,759	187,380	113,866	37,086	58,440	90,702	16,955	3,246	
	Total	310,313	2,070,195	1,051,143	3,196,744	483,703	489,834	10,352	0	989,464	185,711	7,858	28,126	239,708	1,487,348	425,873	131,462	203,595	0	2,657,223	1,367,515	814,140	87,599	159,981	194,748	62,740	3,467	
	Bu	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
	Bd	0	0	0	5,481	883	182	2,985	0	0	913	0	0	0	0	30,625	24,529	0	0	9,084	0	4,641	8,176	2,122	1,751	0	0	
	Bo	0	0	0	8,886	15,829	0	7,453	0	22,203	175	7,074	1,839	93,417	23,015	0	108	0	12,063	632	0	0	0	0	0	400	0	
	Bac	276,467	406,582	116,220	38,024	133,741	207,307	82,897	0	251,898	40,089	48,613	60,803	89,526	287,172	242,924	149,091	137,646	0	43,551	22,029	215,443	66,159	12,784	30,045	14,716	5,835	
	B(et)	67,726	138,263	51,074	169,068	18,812	20,813	135,215	0	81,768	58,461	3,751	3,003	13,849	249,588	36,755	13,204	4,567	0	22,653	19,225	59,742	29,434	64,615	37,986	4,891	0	
	Bl	0	0	0	3,097	0	0	0	0	0	0	0	0	143	167,078	190,589	11,522	0	0	81,146	0	80	0	0	0	0	0	
	Bl(et)	0	2,118	0	31	0	0	0	0	0	0	0	0	9,658	3,046	13,106	0	0	0	806	0	22,324	927	5,301	9,384	1,111	204	
	Total	344,193	546,963	167,294	224,587	169,265	228,302	228,553	0	333,666	121,666	52,539	70,880	215,015	830,926	530,812	173,817	142,321	0	169,303	41,886	302,230	104,696	84,822	99,169	21,118	6,039	
	Gw	12,805	261,400	236,468	115,646	47,179	310	39,470	0	6,780	69,889	594	0	16,735	24,004	20,594	19,437	9,690	0	8,544	1,863	129,111	10,837	1,881	3,373	7,056	0	
	Gb	5,018	67,850	1,393	18,190	40,435	22,092	89,995	0	18,226	2,924	0	76	3,218	8,425	673	0	474	0	3,588	0	21,805	739	3,577	842	17,767	0	
	Go	1,326	13,786	0	22,536	15,856	5,014	290,908	0	2,140	40,573	3,198	3	4,132	63	274	5,646	1,039	0	1,704	2,059	1,521	21	0	218	0		
	Gsc	13,464	31,853	15,260	5,362	65,386	202,673	178,574	0	118,608	113,576	26,033	204,719	144,842	7,519	138,345	99,718	21,443	0	21,404	4,495	20,352	26,962	0	531	21,472	535	
	Gws	0	37,223	31,299	182,803	1,905	15,678	0	0	22,336	26,972	0	0	6,993	45,441	7,239	0	1,784	0	378,070	274,680	4,641	0	0	0	2,485	0	
	Gba	533	23,385	29,722	277,322	15,655	43,291	1,946	0	87,461	48,589	0	0	52,028	211,829	36,323	13,277	36,119	0	400,620	44,832	23,397	3,098	2,682	1,270	2,353	94	
	Gos	752	10,487	6,981	140,628	12,339	25,692	3,438	0	39,858	11,425	247	16,521	41,859	129,122	22,858	49,534	46,261	0	166,904	14,023	2,039	3,591	338	0	287	0	
	Total	33,898	445,984	312,123	762,487	198,758	314,750	604,231	0	295,409	313,948	30,072	221,319	269,747	426,403	226,306	187,612	116,810	0	980,834	341,952	202,866	44,248	8,478	6,234	51,420	629	
	Cm	86,892	228,841	90,462	140,401	38,756	103,672	45,269	0	292,431	182,340	230,040	210,256	85,201	29,662	51,798	143,844	306,690	0	248,531	109,807	53,498	25,424	65,946	64,839	8,758	8,313	
	Cic	0	20,029	214,563	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	248	0	0	0	2,552	0	541	
Cic(st)	10,907	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	818	0	0		
Cbc	0	0	0	0	0	0	10,835	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4,647	1,119	0	0		
Cbc	0	3,410	0	0	273	894	38,398	0	51,325	56,414	38,412	285,719	18,771	0	32,710	30,455	9,220	0	10,345	22,686	3,209	52,795	9,364	42,477	9,065	4,680		
Total	97,799	252,280	305,025	140,401	39,029	104,566	94,502	0	343,756	238,844	268,452	495,975	103,992	29,662	84,508	274,299	315,910	0	269,276	132,493	56,955	78,220	78,487	111,805	17,823	13,534		
BSL	0	1,529	2,061	15,132	0	3,204	4,867	0	0	667	0	537	1,192	0	0	0	0	0	0	0	0	0	0	0	47	0		
SC	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		
RO	0	127	369	2,969	0	184	0	0	26	0	76	0	272	304	0	0	0	0	135	0	0	0	185	0	0	0		
ICE	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		
Total	0	1,656	2,430	18,101	0	3,388	4,867	0	26	667	76	537	1,464	304	0	0	0	0	135	0	0	0	185	47	0	0		
Ocean	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	5,263		
JW	276,850	5,840	9,012	255,042	288,625	340,977	624	0	173	48	247	982	5,175	7,263	2,850	595	117	0	985	19,032	44	897	0	509	51	0		
SAM	4,847	27,335	12,443	60,838	5,593	23,038	455	0	27,286	9,263	0	22,799	55,971	14,609	26,086	37,098	9,021	0	40,513	62,781	0	0	0	0	0	0		
Total	281,697	33,173	21,455	315,880	294,208	364,015	1,079	0	27,459	9,311	247	23,781	61,146	21,872	28,936	37,693	9,138	0	41,498	81,813	44	897	0	509	51	2,263		
Urban	432	2,855	956	214	0	614	131	0	465	0	215	1,025	136	212	428	109	489	0	1,268	195	389	832	183	316	117	1,679		
Total	432	2,855	956	214	0	614	131	0	465	0	215	1,025	136	212	428	109	489	0	1,268	195	389	832	183	316	117	1,679		
C.Total	1,069,667	3,587,246	1,860,426	4,668,328	1,186,041	1,512,979	943,769	0	3,990,245	872,879	359,459	841,663	791,406	2,796,727	1,297,872	705,625	788,263	0	4,108,537	1,985,854	1,411,051	334,336	394,366	454,168	165,602	33,853		
Protected Area	Forest R	4,409	411,786	319,592	2,470,791	58,331	81,646	152	314,181	174,879	0	510	32,738	0	807,890	0	29,521	129,636	1,859,131	325,820	932,737	0	24,226	38,175	30,123	2,849	0	
	Game R.	0	293,772	12,281	583,761	0	1,860	82,246	397,673	61,345	232,180	0	0	0	1,683,848	2,365	0	0	85,114	0	349,627	0	304</					

Table 3.2.1 Population, Road Densities and Cereals Deficits for Respective Districts (1/3)

No.	Region	District	Land area (km ²)	Population Density			Road Density					Foods Deficit in 2000/01 ¹			Overall Evaluation	
				Population (estimated for 2002) ²	Density (nos/km ²)	Evaluation Score Judge	(Trunk and Regional Roads) (km)	(District and Other Small Roads) (km)	Total (km)	Density (m/km ²)	Evaluation Score Judge	Deficit (%)	Evaluation Score Judge	Score Judge		
1	Arusha	Arumeru	2,979	728,000	244	2 High	388.0	844.0	1,232.0	414	2 High	53	2 High	6 High		
2		Arusha	Including Arumeru District			Including Arumeru District							6 High			
3		Babati	4,969	332,000	67	2 High	274.0	726.0	1,000.0	201	2 High	n.a	2 High	6 High		
4		Hanang	3,436	180,000	52	2 High	140.0	475.0	615.0	179	2 High	44	1 Low	5 Medium		
5		Karatu	3,300	153,000	46	2 High	103.0	278.0	381.0	115	2 High	68	2 High	6 High		
6		Kiteto	16,305	128,000	8	1 Low	480.0	1,456.0	1,936.0	119	2 High	71	2 High	5 Medium		
7		Mbulu	4,352	202,000	46	2 High	150.0	536.0	686.0	158	2 High	68	2 High	6 High		
8		Monduli	14,201	174,000	12	1 Low	247.0	913.0	1,160.0	82	1 Low	50	2 High	4 Medium		
9		Ngrongoro	14,036	110,000	8	1 Low	240.0	275.0	515.0	37	1 Low	inspected ³	2 High	4 Medium		
10		Simanjiro	18,851	148,000	8	1 Low	240.0	991.0	1,231.0	65	1 Low	71	2 High	4 Medium		
		Sub-total	82,429	2,155,000	26		2,262.0	6,494	8,756.0	106						
11	Coast	Bagamoyo	9,842	240,000	24	1 Low	470.0	435.0	903.0	92	1 Low	26	1 Low	3 Low		
12		Kibaha	1,812	115,000	64	2 High	98.0	272.0	370.0	204	2 High	61	2 High	6 High		
13		Kisarawe	4,464	175,000	39	2 High	151.0	749.0	900.0	202	2 High	0	1 Low	5 Medium		
14		Mafia	518	46,000	89	2 High	68.0	141.0	209.0	403	2 High	100	2 High	6 High		
15		Mkururanga	2,432	95,000	39	2 High	135.0	317.0	452.0	186	2 High	0	1 Low	5 Medium		
16		Rufiji	13,339	210,000	16	1 Low	240.0	639.0	879.0	66	1 Low	26	1 Low	3 Low		
		Sub-total	32,407	881,000	27		1,162.0	2,551.0	3,713.0	115						
17	DSM ³	Dar Apex City	Including Kinondoni District			Including Kinondoni District							5 Medium			
18		Ilala	210	582,000	2,771	2 High	150.0	42.0	570.0	2,714	2 High	17	1 Low	5 Medium		
19		Kinondoni	652	1,084,000	1,663	2 High	248.0	499.0	747.0	1,146	2 High	20	1 Low	5 Medium		
20		Temeke	531	708,000	1,333	2 High	232.0	505.0	737.0	1,388	2 High	50	2 High	6 High		
		Sub-total	1,393	2,374,000	1,704		630.0	1,046.0	1,676.0	1,203						
21	Dodoma	Dodoma	16,576	789,000	48	2 High	520.0	1,127.0	1,647.0	99	2 High	89	2 High	6 High		
22		Kongwa	Including Mpwapwa District			Including Mpwapwa District							5 Medium			
23		Kondoa	13,209	482,000	37	2 High	359.0	917.0	1,276.0	97	2 High	76	2 High	6 High		
24		Mpwapwa/(Kongwa)	11,526	481,000	42	2 High	356.0	957.0	1,313.0	114	2 High	42	1 Low	5 Medium		
		Sub-total	41,311	1,752,000	42		1,235	3,001.0	4,236.0	103						
25	Iringa	Iringa	28,620	653,000	23	1 Low	693.9	1,366.0	2,059.9	72	1 Low	23	1 Low	3 Low		
26		Ludewa	8,397	145,000	17	1 Low	259.9	885.0	1,144.9	136	2 High	3	1 Low	4 Medium		
27		Makete	4,128	168,000	41	2 High	242.4	502.0	744.4	180	2 High	11	1 Low	5 Medium		
28		Mufindi	7,123	334,000	47	2 High	388.5	835.0	1,223.5	172	2 High	18	1 Low	5 Medium		
29		Njombe	10,668	460,000	43	2 High	416.2	1,086.0	1,502.2	141	2 High	18	1 Low	5 Medium		
		Sub-total	58,936	1,760,000	30		2,000.9	4,674.0	6,674.9	113						
30	Kagera	Bukoba	7,860	585,000	74	2 High	460.5	550.8	1,011.3	129	2 High	3	1 Low	5 Medium		
31		Biharamulo	10,095	314,000	31	1 Low	401.0	732.0	1,133.0	112	2 High	14	1 Low	4 Medium		
32		Karagwe	7,716	438,000	57	2 High	284.5	434.6	719.1	93	2 High	26	1 Low	5 Medium		
33		Muleba	10,739	411,000	38	2 High	245.5	368.6	614.1	57	1 Low	21	1 Low	4 Medium		
34		Ngara	4,428	237,000	54	2 High	349.0	424.8	773.8	175	2 High	19	1 Low	5 Medium		
		Sub-total	40,838	1,985,000	49		1,740.5	2,510.8	4,251.3	104						

Source: Socio-Economic Profiles. /1: surveyed by Food Security Department, MAFS, /2: inspected by Food Security Department, /3: Das es Salaam Municipality, /4: President's Office (but rounded)

Table 3.2.1 Population, Road Densities and Cereals Deficits for Respective Districts (2/3)

No.	Region	District	Land area (km ²)	Population Density				Road Density						Foods Deficit in 2000/01			Overall Evaluation	
				Population (estimated for 2000) ¹	Density (nos/km ²)	Evaluation		(Trunk and Regional Roads) (km)	(District and Other Small Roads) (km)	Total (km)	Density (m/km ²)	Evaluation		Deficit (%)	Evaluation		Score	Judge
						Score	Judge					Score	Judge		Score	Judge		
35	Kigoma	Kasulu	9,324	470,000	50	2	High	312.0	355.0	667.0	72	1	Low	9	1	Low	4	Medium
36		Kibondo	16,058	258,000	16	1	Low	260.0	164.0	424.0	26	1	Low	43	1	Low	3	Low
37		Kigoma	19,685	525,000	27	1	Low	488.0	202.0	690.0	35	1	Low	15	1	Low	3	Low
		Sub-total	45,067	1,253,000	28			1,060.0	721.0	1,781.0	40							
38	Kilimanjaro	Haji	2,112	416,000	197	2	High	136.0	390.0	526.0	249	2	High	inspected ²	1	Low	5	Medium
39		Moshi	1,771	706,000	399	2	High	562.0	587.0	1,149.0	649	2	High	15	1	Low	5	Medium
40		Mwanga	2,698	204,000	76	2	High	243.0	263.0	506.0	188	2	High	60	2	High	6	High
41		Rombo	1,442	418,000	290	2	High	152.0	618.0	770.0	534	2	High	inspected ²	2	High	6	High
42		Same	5,186	354,000	68	2	High	354.0	414.0	768.0	148	2	High	69	2	High	6	High
		Sub-total	13,209	2,098,000	159			1,447.0	2,272.0	3,719.0	282							
43	Lindi	Kilwa	13,920	206,000	15	1	Low							18	1	Low	4	Medium
44		Lindi Urban	7,846	341,000	44	2	High							33	1	Low	5	High
45		Liwale	36,084	71,000	2	1	Low	957.0	5,729.0	6,686.0	100	2	High	28	1	Low	4	Medium
46		Nachingwea	7,070	161,000	23	1	Low							34	1	Low	4	Medium
47		Ruangwa	2,080	105,000	51	2	High							33	1	Low	5	Medium
		Sub-total	67,000	884,000	13			957.0	5,729.0	6,686.0	100							
48	Mara	Bunda	2,782	298,000	107	2	High	194.0	421.0	615.0	221	2	High	71	2	High	6	High
49		Musoma	4,009	468,000	117	2	High	292.0	547.0	839.0	209	2	High	29	1	Low	5	Medium
50		Tarime	3,885	506,000	130	2	High	348.0	452.0	800.0	206	2	High	14	1	Low	5	Medium
51		Serengeti	10,942	168,000	15	1	Low	300.0	253.0	553.0	51	1	Low	16	1	Low	3	Low
		Sub-total	21,618	1,440,000	67			1,134.0	1,673.0	2,807.0	130							
52	Mbeya	Chunya	29,219	249,000	9	1	Low	315.5	390.4	705.9	24	1	Low	inspected ²	1	Low	3	Low
53		Ileje	1,908	134,000	70	2	High	175.0	408.0	583.0	306	2	High	15	1	Low	5	Medium
54		Kyela	1,322	167,000	126	2	High	149.0	299.0	448.0	339	2	High	38	1	Low	5	Medium
55		Mbarali	16,000	172,000	11	1	Low	263.1	359.7	622.8	39	1	Low	0	1	Low	3	Low
56		Mbeya	19,278	733,000	38	2	High	317.1	433.3	750.4	39	1	Low	0	1	Low	4	Medium
57		Mbozi	9,679	499,000	52	2	High	394.0	377.0	771.0	80	1	Low	6	1	Low	4	Medium
58		Rungwe	2,211	276,000	125	2	High	380.0	616.0	996.0	450	2	High	inspected ²	1	Low	5	Medium
		Sub-total	79,617	2,230,000	28			1,993.7	2,883.4	4,877.1	61							
59	Morogoro	Kilosa	14,918	515,000	35	2	High	445.0	1,063.0	1,508.0	101	2	High	inspected ²	1	Low	5	Medium
60		Kilombero	14,246	816,000	57	1	Low	345.0	255.0	600.0	42	1	Low	7	1	Low	3	Low
61		Morogoro	19,316	278,000	14	2	High	518.0	645.0	1,163.0	60	1	Low	23	1	Low	4	Medium
62		Ulanga	24,460	206,000	8	1	Low	212.0	259.0	471.0	19	1	Low	69	2	High	4	Medium
		Sub-total	72,940	1,815,000	25			1,520	2,222	3,742.0	51							
63	Mtwara	Masasi	8,940	435,000	49	2	High	746.2	2,813.8	3,560.0	398	2	High	35	1	Low	5	Medium
64		Mtwara	3,760	319,000	85	2	High	199.7	753.3	953.0	253	2	High	28	1	Low	5	Medium
65		Newela	2,126	183,000	86	2	High	120.1	452.7	572.8	269	2	High	21	1	Low	5	Medium
66		Tandahimba	1,894	216,000	114	2	High	106.8	402.9	509.7	269	2	High	21	1	Low	5	Medium
		Sub-total	16,720	1,153,000	69			1,173	4,423	5,595.5	335							

Source: Socio-Economic Profiles. /1: surveyed by Food Security Department, MAFS, /2: inspected by Food Security Department, /3: Das es Salaam Municipality, /4: President's Office (but rounded)

Table 3.2.1 Population, Road Densities and Cereals Deficits for Respective Districts (3/3)

No.	Region	District	Land area (km ²)	Population Density			Road Density					Cereals Deficit in 2000 ¹			Overall Evaluation	
				Population (estimated for 2000) ⁴	Density (nos/km ²)	Evaluation Score Judge	(Trunk and Regional Roads) (km)	District and Other Small Roads) (km)	Total (km)	Density (m/km ²)	Evaluation Score Judge	Deficit (%)	Evaluation Score Judge	Score Judge		
67	Mwanza	Geita	6,775	634,000	94	2 High	444.0	1,073.0	1,517.0	224	2 High	3	1 Low	5 Medium		
68		Kwimba	3,903	340,000	87	2 High	316.2	581.6	897.8	230	2 High	58	2 High	6 High		
69		Magu	3,070	449,000	146	2 High	293.0	943.0	1,236.0	403	2 High	91	2 High	6 High		
70		Misungwi	1,947	279,000	143	2 High	157.8	290.4	448.2	230	2 High	58	2 High	6 High		
71		Mwanza	425	322,000	758	2 High	165.5	695.5	861.0	2,026	2 High	13	1 Low	5 Medium		
72		Sengerema	3,335	439,000	132	2 High	364.0	660.0	1,024.0	307	2 High	6	1 Low	5 Medium		
73		Ukerewe	425	250,000	588	2 High	110.0	255.0	365.0	859	2 High	6	1 Low	5 Medium		
		Sub-total	19,880	2,713,000	137		1,850.5	4,498.5	6,349.0	319						
74	Ruvuma	Mbinga	11,396	418,000	37	2 High	449.2	604.2	1,053.4	92	1 Low	29	1 Low	4 Medium		
75		Songea	34,219	525,000	15	1 Low	799.0	911.0	1,710.0	50	1 Low	13	1 Low	3 Low		
76		Tunduru	18,778	262,000	14	1 Low	350.0	762.0	1,112.0	59	1 Low	inspected ²	2 High	4 Medium		
		Sub-total	64,393	1,205,000	19		1,598.2	2,277.2	3,875.4	60						
77	Rukwa	Mpanda	47,527	394,000	8	1 Low	831.0	977.8	1,808.8	38	1 Low	inspected ²	1 Low	3 Low		
78		Nkasi	13,124	184,000	14	1 Low	451.0	359.0	810.0	62	1 Low	inspected ²	1 Low	3 Low		
79		Sumbawanga	14,587	581,000	40	2 High	1,027.0	808.9	1,835.9	126	2 High	inspected ²	1 Low	5 Medium		
		Sub-total	75,238	1,159,000	15		2,309.0	2,145.7	4,454.7	59						
80	Shinyanga	Bariadi	9,777	567,000	58	2 High	96.8	926.0	1,022.8	105	2 High	20	1 Low	5 Medium		
81		Bukombe	10,482	248,000	24	1 Low	342.8	836.0	1,178.8	112	2 High	39	1 Low	4 Medium		
82		Kahama	9,461	747,000	79	2 High						39	1 Low	5 Medium		
83		Meatu	8,871	237,000	27	1 Low	93.4	724.0	817.4	92	2 High	52	2 High	5 Medium		
84		Maswa	2,736	328,000	120	2 High	234.9	383.5	618.4	226	2 High	60	2 High	6 High		
85	Shinyanga	9,454	504,000	53	2 High	549.1	1,483.0	2,032.1	215	2 High	68	2 High	6 High			
		Sub-total	50,781	2,631,000	52		1,317	4,353	5,669.5	112						
86	Singida	Iramba	7,900	415,000	53	2 High	356.0	530.5	886.5	112	2 High	22	1 Low	5 Medium		
87		Manyoni	28,620	194,000	7	1 Low	622.0	227.0	849.0	30	1 Low	24	1 Low	3 Low		
88		Singida	12,821	524,000	41	2 High	477.0	1,025.0	1,502.0	117	2 High	63	2 High	6 High		
		Sub-total	49,341	1,133,000	23		1,455.0	1,782.5	3,237.5	66						
89	Tabora	Igunga	6,788	288,000	42	2 High	379.0	128.0	507.0	75	1 Low	36	1 Low	4 Medium		
90		Nzoga	6,961	419,000	60	2 High	401.0	742.0	1,143.0	164	2 High	59	2 High	6 High		
91		Sikonge	45,000	324,000	7	1 Low	996.0	922.0	1,918.0	43	1 Low	44	1 Low	3 Low		
92		Tabora	6,104	173,000	28	1 Low						52	2 High	4 Medium		
93		Urambo	21,299	266,000	13	1 Low	140.0	1,132.0	1,272.0	60	1 Low	22	1 Low	3 Low		
		Sub-total	86,152	1,470,000	17		1,916.0	2,924.0	4,840.0	56						
94	Tanga	Handeni	13,209	355,000	27	1 Low	452.5	449.3	901.8	68	1 Low	8	1 Low	3 Low		
95		Korogwe	3,756	307,000	82	2 High	260.4	113.9	374.3	100	2 High	26	1 Low	5 Medium		
96		Lushoto	3,500	503,000	144	2 High	211.6	317.4	529.0	151	2 High	35	1 Low	5 Medium		
97		Muheza/Tanga	5,458	590,000	108	2 High	259.5	441.9	701.4	129	2 High	59	2 High	6 High		
98		Pangani	1,425	53,000	37	2 High	196.8	74.2	271.0	190	2 High	50	2 High	6 High		
99	Tanga		Including Muheza District			Including Muheza District										
		Sub-total	27,348	1,808,000	66		1,380.8	1,396.7	2,777.5	102						

Source: Socio-Economic Profiles. /1: surveyed by Food Security Department, MAFS, /2: inspected by Food Security Department, /3: Das es Salaam Municipality, /4: President's Office (but rounded

Table 4.1.1 Demarcation of Irrigation Potential Area (2/3)

No.	Region	Districts	Water Resources					Land Resources					Socio-Economy					Overall Assessment				
			E	W	C	S	N	E	W	C	S	N	E	W	C	S	N	E	W	C	S	N
34	Kigoma	Kasulu	H	H	H	H	H	O	Ma	M	O	Ma	M	M	M	M	M	O	Ma	M3	O	Ma
35		Kibondo	H	H	H	H	H	O	Ma	O	M	Ma	L	L	L	L	L	O	Ma	O	L2	Ma
36		Kigoma	L	H	H	L	H	M	O	M	O	Ma	L	O	L	O	L	L7	O	L2	O	Ma
37	Kilimanjaro	Hai	H	H	H	H	H	O	H	H	M	O	H	H	H	H	H	O	H1	H1	M1	O
38		Moshi	H	H	H	H	H	H	H	H	Ma	O	H	H	H	H	H	H1	H1	H1	Ma	O
39		Mwanga	L	H	H	H	L	M	M	H	M	M	H	H	H	H	H	L5	M1	H1	M1	L5
40		Rombo	L	H	H	H	H	H	O	O	H	O	H	H	H	H	H	L1	O	O	H1	O
41		Same	L	H	L	L	L	O	Ma	M	M	O	H	H	H	H	H	O	Ma	L5	L5	O
42	Lindi	Kilwa	L	L	L	L	L	M	Ma	O	M	Ma	M	M	M	M	M	L6	Ma	O	L6	Ma
43		Lindi	L	L	L	L	L	M	Ma	Ma	M	M	H	H	H	H	H	L5	Ma	Ma	L5	L5
44		Liwale	L	H	L	L	H	Ma	O	Ma	M	O	M	M	M	M	M	Ma	O	Ma	L6	O
45		Nachingwea	L	L	L	L	L	Ma	M	M	M	M	M	M	M	M	M	Ma	L6	L6	L6	L6
46		Ruangwa	L	L	L	L	L	Ma	M	M	M	M	M	M	M	M	M	Ma	L6	L6	L6	L6
47	Mara	Bunda	H	H	H	H	H	O	M	H	O	M	H	H	H	O	H	O	M1	H1	O	M1
48		Musoma	H	H	H	H	H	M	O	M	H	M	M	O	H	H	H	M3	O	M1	H1	M1
49		Tarime	H	H	H	H	H	M	O	O	M	Ma	M	O	O	H	H	M3	O	O	M1	Ma
50		Serengeti	L	H	H	H	H	O	M	O	O	O	O	M	O	O	O	O	M3	O	O	O
51	Mbeya	Chunya	L	L	L	L	L	O	O	Ma	Ma	Ma	L	L	L	M	L	O	O	Ma	Ma	Ma
52		Ileje	H	H	H	H	H	M	H	M	M	Ma	M	M	M	M	M	M3	H2	M3	M3	Ma
53		Kyela	H	H	H	H	H	O	O	H	H	Ma	O	M	M	M	M	O	H2	H2	H2	Ma
54		Mbarali	H	L	L	L	L	Ma	Ma	M	M	O	M	L	L	M	L	Ma	Ma	L7	L6	O
55		Mbeya	L	L	L	H	L	M	Ma	Ma	H	M	H	H	H	M	H	L5	Ma	Ma	H2	L5
56		Mbozi	L	H	H	H	L	M	M	M	M	Ma	M	M	M	M	M	L6	M3	M3	M3	Ma
57		Rungwe	H	H	H	H	H	M	H	H	H	O	H	M	M	M	H	M1	H2	H2	H2	O
58	Morogoro	Kilosa	H	L	L	L	L	H	Ma	H	O	Ma	H	M	H	H	H	H1	Ma	L1	O	Ma
59		Kilombero	H	H	H	H	H	O	M	M	Ma	M	L	L	L	L	L	O	L2	L2	Ma	L2
60		Morogoro	L	H	H	H	H	Ma	M	M	O	M	H	H	M	H	M	Ma	M1	M1	O	M1
61		Ulanga	H	H	H	H	H	O	M	Ma	O	O	M	M	M	M	M	O	M3	Ma	O	O
62	Mtwara	Masasi	L	L	L	L	L	H	Ma	M	Ma	M	M	M	M	M	M	L3	Ma	L6	Ma	L6
63		Mtwara	L	L	L	L	L	H	H	M	H	Ma	M	M	M	M	M	L3	L3	L6	L3	Ma
64		Newela	L	L	L	L	L	H	H	H	H	H	M	M	M	M	M	L3	L3	L3	L3	L3
65		Tandahimba	L	L	L	L	L	H	H	H	H	H	M	M	M	M	M	L3	L3	L3	L3	L3

Remarks:

E : Eastern part, W : Western part, C : Central part, S : Southern part, N : Northern part
 H : High, M : Medium/Moderate, L : Low, Ma : Marginal, O : Ommissible (due to protected area and water body)

(2) Overall Assessment

H1: Natural resources and marketing conditions would be

H2: Strengthening of marketing would be required.

M1: Land reclamation would be required.

M2: Development of marketing would be required.

M3: Land reclamation and strengthening of marketing would be required.

L1: Irrigation method should be carefully selected. Exploitation of another water resource would be alternative way if surrounding situation allows.

L2: Land reclamation and development of marketing would be required.

L3: Careful selection of irrigation method and strengthening of marketing would be required. Exploitation of another water resource would be another way if surrounding situation

L4: Careful selection of irrigation method and development of marketing would be required. Exploitation of another water resource would be another way if surrounding situation

L5: Careful selection of irrigation method and land reclamation would be required. Exploitation of another water resource would be another way if surrounding situation allows.

L6: Careful selection of irrigation method, land reclamation and strengthening of marketing would be required. Exploitation of another water resource would be another way if surrounding situation allows.

L7: Careful selection of irrigation method, land reclamation and development of marketing would be required. Exploitation of another water resource would be another way if surrounding situation allows.

Source: JICA Study Team

Table 4.1.1 Demarcation of Irrigation Potential Area (3/3)

No.	Region	Districts	Water Resources					Land Resources					Socio-Economy					Overall Assessment				
			E	W	C	S	N	E	W	C	S	N	E	W	C	S	N	E	W	C	S	N
66	Mwanza	Geita	L	L	L	L	L	H	H	O	Ma	O	M	M	M	M	O	L3	L3	O	Ma	O
67		Kwimba	L	L	L	L	H	H	M	M	H	Ma	H	H	H	H	H	L1	L5	L5	L1	Ma
68		Magu	H	L	H	H	H	M	M	Ma	M	O	H	H	H	H	O	M1	L5	Ma	M1	O
69		Misungwi	L	L	L	L	L	H	Ma	M	M	H	H	H	H	H	L1	Ma	L5	L5	L1	
70		Mwanza	L	L	L	L	L	M	O	Ma	Ma	O	H	O	H	H	O	L5	O	Ma	Ma	O
71		Sengerema	L	L	L	L	L	Ma	O	H	H	O	H	O	M	H	O	Ma	O	L3	L1	O
72		Ukerewe	H	L	H	H	H	O	O	M	O	O	O	O	M	O	O	O	O	M3	O	O
73	Rukuwa	Mpanda	L	L	L	L	H	O	Ma	O	O	O	L	L	L	L	O	Ma	O	O	O	O
74		Nkasi	L	L	L	L	L	M	O	M	O	Ma	L	L	L	L	L	L7	O	L7	O	Ma
75		Sumbawanga	L	L	L	H	L	Ma	O	M	M	M	M	M	M	M	Ma	O	L6	M3	L6	
76	Ruvuma	Mbinga	H	L	L	L	H	Ma	O	Ma	Ma	M	M	O	M	M	Ma	O	Ma	Ma	M3	
77		Songea	H	H	H	L	H	O	Ma	M	M	Ma	L	L	L	L	O	Ma	L2	L7	Ma	
78		Tunduru	L	L	L	L	L	Ma	Ma	H	H	O	M	M	M	M	Ma	Ma	L3	L3	O	
79	Shinyanga	Bariadi	L	H	H	H	H	O	M	O	M	M	H	M	M	M	O	M1	O	M3	M3	
80		Bukombe	L	L	L	L	L	M	O	O	O	Ma	M	M	M	M	L6	O	O	O	Ma	
81		Kahama	L	L	L	L	L	M	Ma	H	O	M	M	M	M	M	L6	Ma	L3	O	L6	
82		Meatu	L	L	L	L	L	Ma	H	Ma	H	O	M	M	M	M	Ma	L3	Ma	L3	O	
83		Maswa	L	L	L	L	L	Ma	H	H	H	H	H	H	H	H	Ma	L1	L1	L1	L1	
84		Shinyanga	L	L	L	L	L	H	M	M	H	H	H	H	H	H	L1	L5	L5	L1	L1	
85	Singida	Iramba	L	L	L	L	L	M	M	H	Ma	Ma	M	M	M	M	L6	L6	L3	Ma	Ma	
86		Manyoni	L	L	L	L	L	M	O	O	O	M	L	L	L	L	L7	O	O	O	L7	
87		Singida	L	L	L	L	L	Ma	Ma	M	M	M	H	H	H	H	Ma	Ma	L5	L5	L5	
88	Tabora	Igunga	L	L	L	L	L	M	H	M	M	M	M	M	M	M	L6	L3	L6	L6	L6	
89		Nzega	L	L	L	L	L	H	O	H	M	H	H	H	H	H	L1	O	L1	L5	L1	
90		Sikonge	L	L	L	L	L	O	O	O	Ma	Ma	L	L	L	L	O	O	O	Ma	Ma	
91		Tabora	L	L	L	L	L	Ma	M	M	Ma	O	M	M	M	M	Ma	L6	L6	Ma	O	
92		Urambo	L	L	L	L	L	Ma	Ma	O	O	Ma	L	L	L	L	Ma	Ma	O	O	Ma	
93	Tanga	Handeni	L	L	L	L	L	Ma	Ma	M	Ma	M	M	L	L	M	Ma	Ma	L7	Ma	L6	
94		Korogwe	L	L	L	L	L	Ma	M	Ma	M	M	H	H	H	H	Ma	L5	Ma	L5	L5	
95		Lushoto	L	L	L	L	L	O	Ma	H	Ma	O	M	H	H	M	O	Ma	L1	Ma	O	
96		Mtweza/Tanga	L	L	L	L	L	M	O	H	Ma	M	H	H	H	H	L5	O	L1	Ma	L5	
97		Pangani	L	L	L	L	L	H	Ma	M	M	Ma	H	H	H	H	L1	Ma	L5	L5	Ma	
98		Tanga	Including Mheza																			

Remarks:

(1) Abbreviations

E : Eastern part, W : Western part, C : Central part, S : Southern part, N : Northern part

H : High, M : Medium/Moderate, L : Low, Ma : Marginal, O : Omissible (due to protected area and water body)

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L5: Careful selection of irrigation method and land reclamation would be required. Exploitation of another water resource would be another way if surrounding situation allows.

L6: Careful selection of irrigation method, land reclamation and strengthening of marketing would be required. Exploitation of another water resource would be another way if surrounding situation allows.

L7: Careful selection of irrigation method, land reclamation and development of marketing would be required. Exploitation of another water resource would be another way if surrounding situation allows.

Source: JICA Study Team

Table 4.1.2 Distribution of Irrigation Development Potential Area in Each Region

(Unit: 1,000ha)

Region	High Potential area (H1-H3)		Medium Potential Area (M1-M3)		Low Potential Area (L1-L6)		Forest and Marginal Land		Water Body		Protected Area		Total Area	
	(1,000 ha.)	(%)	(1,000 ha.)	(%)	(1,000 ha.)	(%)	(1,000 ha.)	(%)	(1,000 ha.)	(%)	(1,000 ha.)	(%)	(1,000 ha.)	(%)
Arusha	455.3	5.4	758.3	9.0	2,626.4	31.2	2,939.9	34.9	315.1	3.7	1,322.0	15.7	8,417.0	100.0
Coast	83.0	2.6	171.8	5.4	961.7	30.1	1,417.6	44.4	49.9	1.6	511.0	16.0	3,195.0	100.0
DSM	-	-	-	-	68.9	39.6	83.3	47.9	20.8	12.0	1.0	0.6	174.0	100.0
Dodoma	1.2	0.0	68.9	1.6	2,015.4	47.8	1,736.4	41.2	41.1	1.0	350.0	8.3	4,213.0	100.0
Iringa	163.6	2.8	1,091.5	18.4	1,125.0	19.0	2,630.1	44.4	268.8	4.5	646.0	10.9	5,925.0	100.0
Kagera	96.3	2.4	59.0	1.5	1,063.2	27.0	569.2	17.0	1,158.3	29.5	887.0	22.6	3,933.0	100.0
Kigoma	0.7	0.0	107.4	2.3	271.1	5.9	1,389.3	30.1	944.4	20.5	1,899.0	41.2	4,612.0	100.0
Kilimanjaro	238.5	17.9	109.6	8.2	231.6	17.4	332.9	25.0	31.4	2.4	390.0	29.2	1,334.0	100.0
Lindi	-	-	19.6	0.3	1,704.9	25.3	2,433.6	36.1	22.9	0.3	2,552.0	37.9	6,733.0	100.0
Mara	210.1	6.9	576.5	18.9	123.4	4.0	435.4	14.3	899.5	29.5	809.0	26.5	3,054.0	100.0
Mbeya	285.1	4.5	499.7	7.9	884.8	14.0	3,329.6	52.6	309.8	4.9	1,016.0	16.1	6,325.0	100.0
Morogoro	376.8	5.4	602.4	8.7	574.3	8.3	2,299.1	33.2	30.4	0.4	3,045.0	44.0	6,928.0	100.0
Mtwara	-	-	-	-	1,332.7	60.7	768.6	35.0	20.7	0.9	72.0	3.3	2,194.0	100.0
Mwanza	98.5	2.8	165.0	4.7	1,013.0	28.6	479.7	13.6	1,577.7	44.6	204.0	5.8	3,538.0	100.0
Rukwa	11.0	0.1	79.8	1.1	888.9	12.0	1,808.2	24.5	974.1	13.2	3,622.0	49.1	7,384.0	100.0
Ruvuma	23.2	0.4	283.7	4.3	1,617.8	24.6	3,283.9	49.9	336.3	5.1	1,042.0	15.8	6,587.0	100.0
Shinyanga	80.4	1.6	215.5	4.3	1,821.2	36.3	811.0	16.2	61.9	1.2	2,023.0	40.4	5,013.0	100.0
Singida	-	-	-	-	1,348.9	27.6	931.1	19.1	112.0	2.3	2,494.0	51.0	4,886.0	100.0
Tabora	-	-	-	-	1,517.0	20.0	1,888.9	24.9	170.1	2.2	4,025.0	53.0	7,601.0	100.0
Tanga	-	-	-	-	1,151.3	41.1	1,428.2	51.0	1.5	0.1	219.0	7.8	2,800.0	100.0
Total	2,123.7	2.2	4,808.9	5.1	22,341.7	23.6	31,096.1	32.8	7,346.7	7.7	27,129.0	28.6	94,846.0	100.0

(Based on the results of GIS analysis)

Table 4.1.3 Distribution of Irrigation Development Potential Area in each Region (Details)

(Unit: 1,000ha.)

	H1	H2	High Potential	M1	M2	M3	Medium Potential	L1	L2	L3	L4	L5	L6	L7	Low Potential	Forest/Marginal
Arusha	376.8	78.5	455.3	217.3	-	541.0	758.3	223.1	-	372.3	-	600.4	1,430.6	0.0	2,626.4	2,939.9
Coast	0.8	82.1	83.0	-	2.0	169.8	171.8	84.3	1.0	136.4	174.0	160.8	242.7	162.5	961.7	1,417.6
DSM	-	-	-	-	-	-	-	35.9	-	-	-	33.0	-	-	68.9	83.3
Dodoma	0.6	0.6	1.2	15.1	-	53.8	68.9	208.2	-	8.5	-	1,688.5	110.2	-	2,015.4	1,736.4
Iringa	52.8	110.8	163.6	238.0	5.7	847.8	1,091.5	96.7	23.6	61.1	27.9	371.3	379.8	164.6	1,125.0	2,630.1
Kagera	-	96.3	96.3	-	0.0	59.0	59.0	-	-	430.4	-	-	632.8	-	1,063.2	669.2
Kigoma	-	0.7	0.7	-	20.7	86.7	107.4	-	119.2	-	7.7	-	-	144.2	271.1	1,389.3
Kilimanjaro	237.7	0.8	238.5	109.3	-	0.3	109.6	48.8	-	-	-	182.8	-	-	231.6	332.9
Lindi	-	-	-	-	-	19.6	19.6	101.8	-	169.6	-	160.0	1,273.5	-	1,704.9	2,433.6
Mara	176.5	33.7	210.1	439.6	11.0	125.9	576.5	-	112.6	-	10.2	-	-	0.7	129.4	435.4
Mbeya	50.4	234.6	285.1	22.5	0.1	477.1	499.7	61.0	17.1	45.7	54.8	121.9	362.2	222.1	884.8	3,329.6
Morogoro	203.8	173.0	376.8	213.0	164.5	224.9	602.4	163.6	228.3	9.0	-	131.5	42.0	-	574.3	2,299.1
Mtwara	-	-	-	-	-	-	-	-	-	819.1	-	-	513.5	-	1,332.7	768.6
Mwanza	95.3	3.2	98.5	153.7	-	11.3	165.0	471.3	-	252.6	-	217.6	71.5	-	1,013.0	479.7
Rukwa	-	11.0	11.0	-	0.1	79.7	79.8	-	12.6	56.6	82.4	-	280.4	456.9	888.9	1,808.2
Ruvuma	-	23.2	23.2	-	197.4	86.3	283.7	-	544.9	316.6	39.2	-	439.4	277.7	1,617.8	3,283.9
Shinyanga	38.1	42.3	80.4	86.0	-	129.4	215.5	629.5	-	457.2	-	259.3	475.2	-	1,821.2	811.0
Singida	-	-	-	-	-	-	-	58.5	-	76.0	16.9	532.3	254.0	411.1	1,348.9	931.1
Tabora	-	-	-	-	-	-	-	265.2	-	299.0	109.9	193.1	484.9	164.9	1,517.0	1,888.9
Tanga	-	-	-	-	-	-	-	244.7	-	31.1	28.2	326.1	274.3	246.8	1,151.3	1,428.2
Total	1,233.0	890.7	2,123.7	1,494.5	401.6	2,912.8	4,808.9	2,692.7	1,059.2	3,541.1	551.3	4,978.7	7,267.2	2,251.4	22,341.7	31,096.1

(Based on the results of GIS analysis)