

Table B7.1 List of Water Level Gauging Stations Selected for Flood Analysis (2/2)

Drainage Area	Station Code	Major River	River	Catchment Area (sq km)	M.A.F. (CMS)	Recorded Period (Year)
2	2C5	Suguta	Arror	185	17	1961 - 1989
	2C7	Kerio	Ndo	893	38	1965 - 1989
	2EC3	Molo	Rongai	48	2	1956 - 1989
	2EF3	Perkerra	Esageri	60	2	1959 - 1982
	2FC5	Njoro	Njoro	125	5	1956 - 1985
	2GA3	Gilgil	Gilgil	136	6	1959 - 1989
	2GB4	Malewa	Wanjohi	152	7	1956 - 1989
	2GC4		Turasha	695	35	1956 - 1984
	2K3	Ewaso Ngiro	Narok	869	90	1959 - 1989
	3	3AA4	Athi	Mbagathi	272	51
3BA29			Nairobi	75	6	1956 - 1989
3BA32			Nairobi	1942	107	1966 - 1987
3CB5			Ndaruga	312	32	1957 - 1989
3DA2			Athi	5724	346	1957 - 1989
3F2			Athi	10132	543	1956 - 1989
3G2			Tsavo	7252	68	1956 - 1989
4		4AA5	Tana	Sagana	505	35
	4AA7		Upper Sagana	41	13	1957 - 1979
	4AC3		Sagana	282	72	1948 - 1989
	4AD1		Gura	430	67	1956 - 1989
	4BB1		Ragati	254	21	1959 - 1989
	4BC2		Tana-Sagana	2365	182	1956 - 1989
	4BE2		Tana P.S.	3672	476	1959 - 1980
	4CA2		Chania	518	55	1946 - 1985
	4CB4		Thika	316	46	1956 - 1989
	4DC2		Rupingazi	404	53	1957 - 1989
	4EA7		Mutonga	1880	187	1966 - 1986
	4F10		Kajita	878	147	1962 - 1989
	4F13		Tana	17179	1168	1948 - 1989
	4G1		Tana	32892	851	1934 - 1989
	5	5AA1	Ewaso Ngiro	Ewaso Narok	577	14
5AC8			Ewaso Narok	3290	68	1958 - 1986
5BC4			Ewaso Ngiro	1870	33	1960 - 1986
5BC8			Engarc Ngobit	256	33	1958 - 1986
5BE4			Sirimon	62	11	1957 - 1983
5BE20			Nanyuki	860	35	1960 - 1986
5D5			Ewaso Ngiro	4561	92	1959 - 1987
5E5			Ewaso Ngiro	15300	344	1949 - 1988

M.A.F.: Mean Annual Flood

Table B7.2 Estimation of Probable Flood Discharges on Regional Flood Frequency Curve Basis

Drainage Area	Major River	Equation Deriving M.A.F.	Multiplier to M.A.F. for Estimation of Discharges of Each Return Period					
			5	10	20	25	50	100 year
1	Nzoia	$Q = 0.080 A^{0.898}$	1.57	2.09	2.68	2.92	3.78	4.82
	Yala	$Q = 0.780 A^{0.644}$	1.60	2.08	2.61	2.82	3.59	4.48
	Nyando	$Q = 0.093 A^{0.960}$	1.70	2.35	2.99	3.28	4.33	5.58
	Sondu	$Q = 0.345 A^{0.756}$	1.77	2.32	2.94	3.13	4.06	5.39
	Kuja/Migori	$Q = 0.205 A^{0.849}$	1.48	1.84	2.23	2.37	2.83	3.33
	Others	$Q = 3.005 A^{0.363}$	1.47	1.84	2.17	2.30	2.63	3.13
2	—	$Q = 0.030 A^{1.069}$	1.71	2.40	3.15	3.49	4.58	6.00
3	Athi	$Q = 0.249 A^{0.835}$	1.87	2.62	3.43	3.79	5.29	7.22
4	Tana	$Q = 0.480 A^{0.794}$	1.52	1.93	2.36	2.52	3.08	3.71
5	Ewaso Ngiro (North)	$Q = 0.812 A^{0.564}$	1.92	2.63	3.39	3.79	5.35	7.45

Note: M.A.F.: Mean Annual Flood
 Q : Flood Discharge (m³/s)
 A : Catchment Area (sq km)

Table B7.3 Selected Floods and Stations

Drainage Area	River	Flood	Gauging Stations	
			Water Level	Rainfall
1	Nzoia	Nov. 1977	1EE1	8935133 (Eldoret)
	Yala	Aug. 1979	1FG1	8934087 (Kobujoi)
	Nyando	Dec. 1982	1GD3	9035244 (Kericho)
	Sondu	Dec. 1982	1JG1	9035244 (Kericho)
	Kuja/Migori	Apr. 1985	1KB5	9134025 (Migori)
2	Turasha	Apr. 1977	2GC4	9036002 (Naivasha)
3	Athi	Dec. 1986	3F2, 3DA2	9137098 (Machakos)
4	Tana	Dec. 1968	4G1, 4F13, 4EA7,	8937051 (Meru)
			4DD2, 4AA5	9036017 (Nyeri)
5	Ewaso Ngiro	Apr. 1968	5E3, 5D5, 5AC8,	9036135 (01 Joro Orok)
			5BE20, 5BE4	9036260 (Lamuria)

Table B7.4 Concentration Time and Peak Runoff Coefficient

Drainage Area	Gauging Station	Catchment Area (Sq km)	Lag (hr)	Tc (hr)	Peak Discharge (CMS)	Rainfall Intensity (mm/hr)	K
1	1GD3	2625	20.5	41	186	0.94	0.27
2	2GC4	695	8.5	17	113	1.98	0.30
3	3DA2	5724	11.5	23	146	1.61	0.10
4	4AA5	505	5.5	11	105	1.19	0.63
	4DD2	1500	6.5	13	261	2.50	0.25
5	5BE4	62	2.5	5	8.9	3.36	0.15
	5BE20	860	4.5	9	95	2.34	0.17
	5AC8	3290	12.5	25	195	1.14	0.28

Table B7.5 Generalized Value of K in Richards Method

Type of Catchment	K	
	Large	Small and Steep
Rocky and Impermeable	0.3	to 1.0
Slightly Permeable, Bare	0.6	to 0.8
Slightly Permeable, Partly Cultivated or Covered with Vegetation	0.4	to 0.6
Cultivated Absorbent Soil	0.3	to 0.4
Sandy Absorbent Soil	0.2	to 0.3
Heavy Forest	0.1	to 0.2

Table B7.6 Runoff Coefficient for Representative Flood

Drainage Area	Gauging Station	Catchment Area (Sq km)	Flood Duration	Direct Runoff (mm)	Rainfall Amount (mm)	f
1	1EE1	11849	1977 Nov. 16-29	17.03	84.7	0.20
	1FG1	2388	1978 Aug. 12-22	16.47	147.2	0.11
	1GD3	2625	1982 Dec. 2-6	7.10	68.7	0.10
	1JG1	3287	1982 Nov.30 - Dec.11	12.86	96.7	0.13
2	2GC4	695	1977 Apr.28 - May 5	26.70	68.0	0.39
3	3DA2	5724	1986 Dec. 6-9	3.54	32.6	0.11
4	4AA5	505	1968 Dec. 2-7	24.91	70.8	0.35
	4DD2	1500	1968 Dec. 1-10	23.07	108.0	0.21
5	5BE4	62	1968 Apr. 23-29	12.17	68.4	0.18
	5AC8	3290	1968 Apr.24 - May 2	13.77	78.0	0.18

Table B7.7 Area Reduction Value

Area in Sq. km	Duration of Rainfall in Hours	
	1 - 6	12 - 24
0	1.0	1.0
500	0.90	0.97
1,000	0.84	0.93
2,000	0.74	0.84
3,000	0.63	0.75
4,000	0.52	0.66
5,000		0.58

Table B7.8 Design Discharges for Flood Protection Plans

Target Area	Target Rivers	Control Point			Design Discharge in This Study			Design Discharge in Previous Study		
		Code, Name	C.A. (Sq km)	Protection Level* (year)	Design Discharge (CMS)	Specific Discharge (CMS/Sq km)	Protection Level* (year)	Design Discharge (CMS)	Specific Discharge (CMS/Sq km)	Reference No.
Yala Swamp	Nzoia	IEE1	11849	25	1070	0.090	25	1100	0.093	1
	Yala	IFG2	2864	25	370	0.129	100	300	0.105	2
	Nyando	IGD3	2625	25	590	0.225	25	425	0.162	3
	Kibos	Rivermouth	274	25	55	0.201	-	-	-	-
Plain	Luando	Rivermouth	440	25	65	0.148	-	-	-	-
	Nyaidho	Upstream of	255	25	55	0.216	-	-	-	-
		Confluence with								
Sundu Rivermouth	Awach Kano	Awach Kano	364	25	60	0.165	-	-	-	-
		Upstream of								
		Confluence with								
		Nyaidhu								
Kuja Rivermouth	Sundu	IJG1	3287	25	500	0.152	-	-	-	-
	Turkwel	Kuja	6600	25	850	0.129	20	860	0.130	4
Downmost Athi	Turkwel	Downstream of	7014	10	320	0.046	-	-	-	-
		Confluence with								
Lumi Rivermouth	Athi	Malmali	36903	10	1590	0.043	-	-	-	-
		Rivermouth								
	Lumi	3J15C	448	25	160	0.357	-	-	-	-

- Reference:
1. Pre-investment Study for Water Management and Development of the Nyando and Nzoia River Basins, 1983, MOWD
 2. Yala Swamp Reclamation Works, 1982, MOA
 3. Nyando Flood Protection Project, 1988, LBDA/MOWD
 4. Lake Basin River Catchment Development River Profile Study -Lower Kuja Irrigation on Development-, 1985, LBDA

Note: * In terms of probability of design discharges

Table B7.9 Hydrological Design Conditions at Existing and Some Proposed Damsites

Drainage Area	Dam Name	Basin Code	River Name	Catchment Area (Sq km)	Dam Design Flood			Spillway Design Flood			Diversion Design Flood			Reference No.
					Peak Discharge (CMS)	Return Period (Year)	Return Period (Year)	Peak Discharge (CMS)	Return Period (Year)	Return Period (Year)	Peak Discharge (CMS)	Return Period (Year)	Sedimentation (CM/Year)	
1	Sondu/Miriu	1JG	Sondu	3345	655(1046)	200(PMF)	655	200	337	2	5750000	1		
	Kipweni River	1CB	Kipwen	33	90	500	90	500	20	5	700	2		
	Londiani	1GC	Kipchorian	136	354	PMP	230	PMP	72	25	70000	3		
	Chebiemit	1BA	Moioben	260	200	1000	200	1000				5		
	Amala	1LB	Amala	475	339	100	332	100			11800	6		
	Timbili	1JC	Kimugu	33	29	100	18	100				7		
	Kimugu	1JC	Kimugu	96	57	100	53	100				7		
	Turkwel	2BC	Turkwel	5900	4000(6000)	1000(PMF)	1200	1000	1750	10	10000000	8		
	Chemususu	2ED	Chemususu	64	260	PMF	202	PMF	25	10	30000	4		
	Kirandich	2BE	Kapleel	8	134	PMF	134	PMF			1200	9		
2	Turasha	2GC	Turasha	711	1100(1750)	1000(PMF)	1100	1000	270	20	360000	10		
	Sererwa	2CC	Aror	185	1160	1000			260	10		11		
	Wanjohi	2GB	Wanjohi	36	45	100	45	100	21	5		12		
	Perkera	2EE	Perkera	512	1370	PMF	1370	PMF	80	10	74000	13		
	Malewa	2GB	Malewa	635	960	1000	960	1000	240	20	318000	10		
	Muoni	3EA	Perennial	20	150	PMF	99	PMF	67	10	20000	14		
	Kiteta	3EB	Ngaa	72	1018	500	570	5000	104	5	65000	15		
	Tsavo	3G	Tsavo	4050	1990	PMF	1550	200*1.2	650	10	160000	16		
	Rare	3L	Rare	1500	1905	PMF	1305	200*1.2	260	10	120000	16		
	Thika	4CB	Thika	71	580	PMF	390	PMF	135	50	20000	17		
3	Masinga	4DE	Tana	7335	3100	PMF	2200	1000	1200	20	5600000	18		
	Kiambere	4ED	Tana	11975	5500	10000	3600	1000				19		
	Thiba	4DA	Thiba	173	590	1000	560	625	280	10	25900	20		
	Rumurui	5AA	Ewaso Narok	673	834	PMF	500	1000	30	10	28000	21		
	Aiyam	5AC	Aiyam	470	1045	PMF			69	10	200000	21		
	Pesi	5AB	Pesi	319	1195	PMF			108	10	10200	21		

REFERENCE

1. Sondu River Multipurpose Development Project, 1985, LBDA
2. Flax Centre Water Supply Project, 1987, MOWD
3. Greater Nakuru Water Supply Project, 1985, MOWD
4. Greater Nakuru Water Supply Project, 1986, MOWD
5. Eldoret Water Supply Phase II, 1986, Municipal Council of Eldoret/MOLG
6. Sigor Longisa Water Supply Scheme, 1985, MOWD
7. Kericho Water Supply Scheme, 1983, MOWD
8. Turkwel Gorge Multipurpose Project, 1979, MOWD
9. Design and Supervision of Kirandich Dam for Kabarnet Water Supply, 1987, MOWD
10. Study for Construction of Dam in Malewa River System Greater Nakuru Water Supply Project, 1990, MOWD/NWCPC
11. Feasibility Study on the Integrated Development of the Aror River Basin, 1989, KVDA
12. Kipipiri Water Supply Project, 1983, MOWD
13. Central Baringo Water Development Plan 1983-2003, 1984, MOWD
14. Muoni Dam Final Design Report, 1985, MOWD
15. Kiteta Water Supply Project, 1983, MOWD
16. Feasibility Study on Water Supply Augmentation Project of Mombasa-Coastal Area-Hinterland, 1981, MOWD
17. Third Nairobi Water Supply Project, 1986, NCC
18. Kiambere Hydro-Electric Scheme, 1981, TARDA
19. Feasibility Study of the Mwea Irrigation Development Project, 1988, MOERD
20. Rumurui Water Supply, 1985, MOWD

Table B7.10 Probable Maximum Flood at Existing Dam Scheme

Drainage Area	Dam Name	Catchment Area (Sq km)	Probable Maximum Flood (CMS)	Representative Gauging Station	Area PMP (mm)
1	Sondu/Miriu	3345	1046	9035003 Kericho	195
	Londiani	136	354	9035002 Londiani	183
2	Turkwel	5900	6000	8934008 Kitale	188
	Chemususu	64	260	9035018 Molo	230
	Kirandich	8	134	8935020 Kabarnet	349
	Turasha	711	1750	9036029 Gilgil	226
	Perkerra	512	1370	9035018 Molo	206
	Muoni	20	150	9137003 Malili	319
3	Tsavo	4050	1990	9237002 Kibwezi	238
	Rare	1500	1905	9338022 Bachuma	176
	Thika	71	580	9036017 Nyeri	330
4	Masinga	7335	3100	9036025 Kinangop	136
	Rumuruti	673	834	8936049 Rumuruti	198
5	Aiyam	470	1045	8936049 Rumuruti	206
	Pesi	319	1195	8936006 Rumuruti	273

Table B7.11 Design Discharge with 100-year Probability for Small Catchment

100-year Probable Daily Rainfall (mm)		Design Peak Discharges (CMS)				
Range	Median Value	Catchment Area (Sq km)				
		20	40	60	80	100
80 - 120	100	45	78	109	137	164
120 - 160	140	69	121	168	212	255
160 - 200	180	96	168	234	295	353
200 - 240	220	125	219	304	383	459
240 - 280	260	155	272	378	477	571
280 - 320	300	187	328	455	575	688
320 - 360	340	220	386	536	676	810
360 - 400	380	255	446	620	782	937
400 - 440	420	290	509	706	891	1067
440 - 480	460	327	573	795	1003	1202

Table B10.1 Rating Equation of Suspended Load and Its Volume

No.	Code	River Name	Catchment Area (sq. km)	Annual Mean Discharge (cms)	Rating Equation		Suspended Load	
					a	b	Mean (ppm)	Annual (ton/year)
1	1DA02	Nzoia	8,417	56.6	18.531	0.446	112	212,298
2	1ED01	Lusumu	1,207	27.9	22.686	0.552	142	128,239
3	1GB05	Ainamotua	606	5.2	44.653	0.675	136	28,954
4	1GB07	Kapchure	129	1.1	68.831	0.328	71	2,555
5	1GD01	Nyando	2,598	17.6	136.508	0.623	815	566,362
6	1HA10	Luando	234	3.0	227.405	0.255	301	26,561
7	1JG01	Sondu	3,287	50.0	13.314	0.409	66	107,160
8	2ED02	Lelgel	108	0.5	79.223	1.115	37	799
9	2EE04	Perkerra	1,334	2.8	1197.201	1.010	3,387	390,033
10	2GB01	Malewa	1,430	3.3	19.302	0.736	46	5,637
11	3AA04	Mbagathi	272	1.6	139.713	0.685	193	4,456
12	3BA09	Karyra	44	0.8	368.177	0.737	312	9,124
13	3BA10	Ruaraka	65	1.1	31.142	0.225	32	989
14	3BA22	Nairobi	75	1.3	51.216	0.392	57	2,231
15	3BB10	Riara	41	0.4	144.554	0.219	118	1,474
16	3CB05	Ndarugu	312	4.4	95.369	0.505	202	29,356
17	3DA02	Athi	5,724	23.6	8.220	0.924	153	131,089
18	3F 02	Athi	10,272	33.6	39.338	0.750	549	753,627
19	3HA12	Athi (L. Falls)	25,203	33.2	48.079	0.823	859	2,057,487
20	3J 06	Lumi	451	1.2	210.044	1.663	284	9,020
21	4AA01	Sagana	96	1.1	40.572	0.739	44	1,659
22	4AA05	Sagana	505	5.6	31.183	0.676	100	18,845
23	4AC03	Sagana	282	4.1	21.177	0.763	62	8,405
24	4BC02	Tana-Sagana	2,365	21.0	2.084	1.924	729	999,721
25	4BD01	Mathioya	500	6.6	1.833	1.875	63	20,107
26	4BE01	Maragua	414	11.3	13.671	1.128	211	70,797
27	4CA02	Chania	518	8.2	8.591	0.967	66	22,132
28	4CB04	Thika	316	6.9	23.957	1.020	172	53,063
29	4DD01	Thiba	2,616	33.4	5.181	0.736	69	75,167
30	4F 01	Tana (G. Falls)	16,972	184.4	2.358	1.134	875	6,098,075
31	4F 19	Kazita	1,702	17.9	4.918	1.117	123	82,057
32	4G 01	Tana (Garissa)	32,892	166.0	134.316	0.447	1,320	6,907,451
33	5BC02	Naromoru	83	0.8	21.242	0.422	19	486
34	5BC06	Burgret	98	1.0	36.569	0.588	37	1,130
35	5BE20	Nanyuki	860	1.8	16.823	0.936	29	2,072
36	5E 03	Ewaso N'giro	15,300	21.6	230.284	0.618	1,538	1,045,035

Note: Annual suspended volume was calculated on daily basis by using dimensionless flow duration curve.

FIGURES

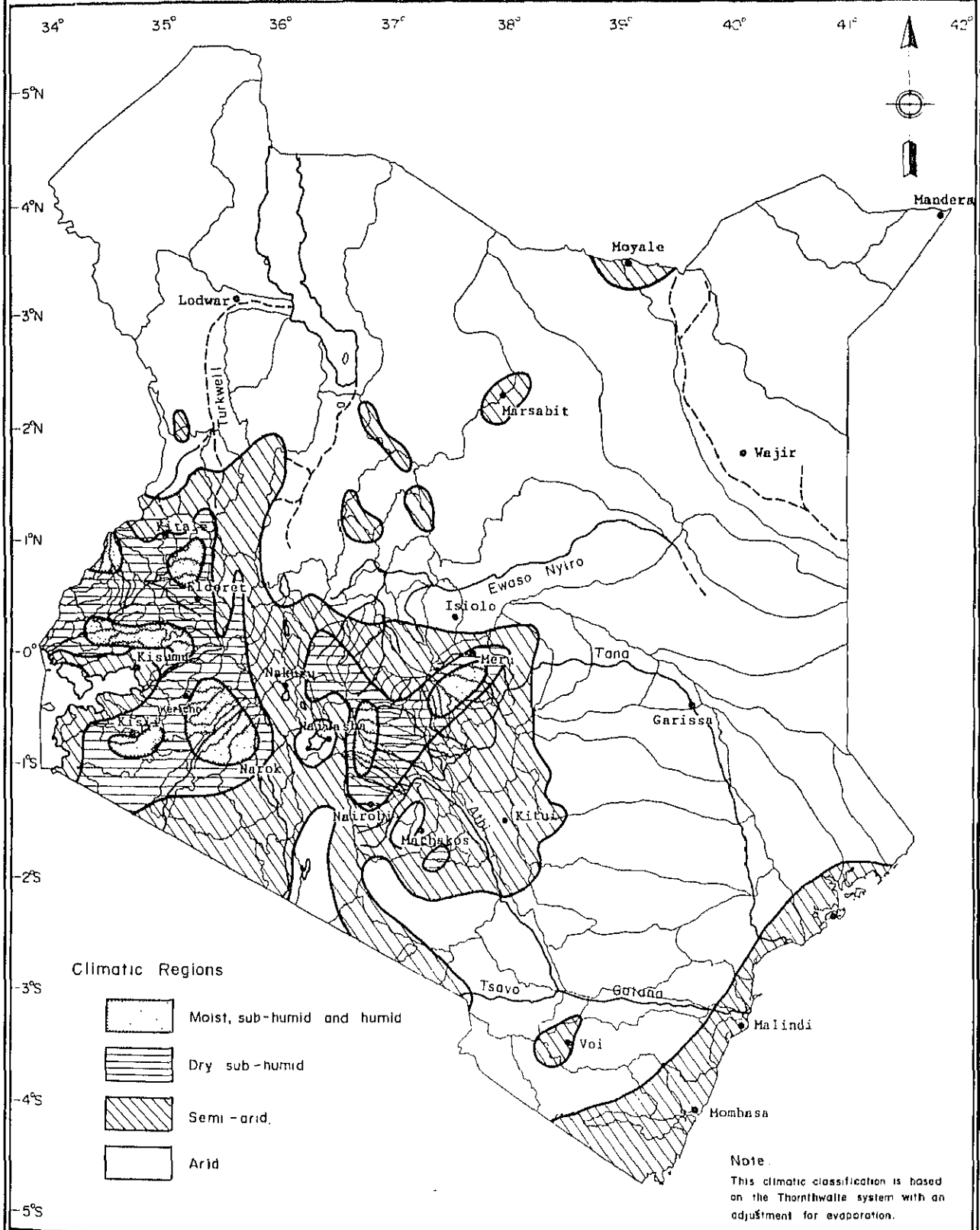
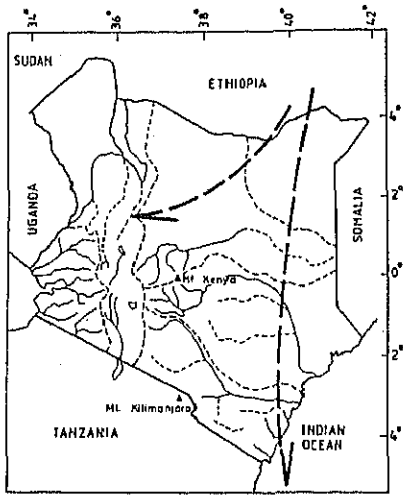
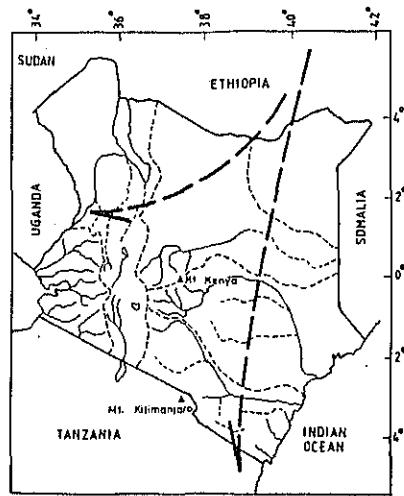


Figure B1.1 Climatic Region

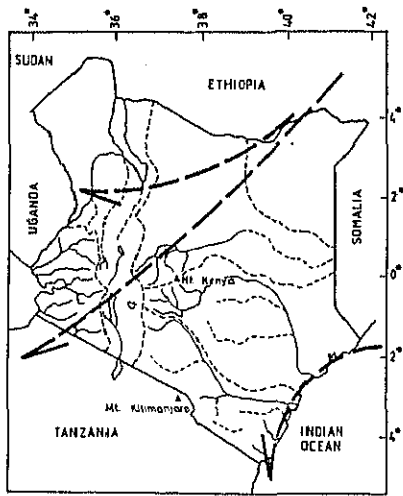
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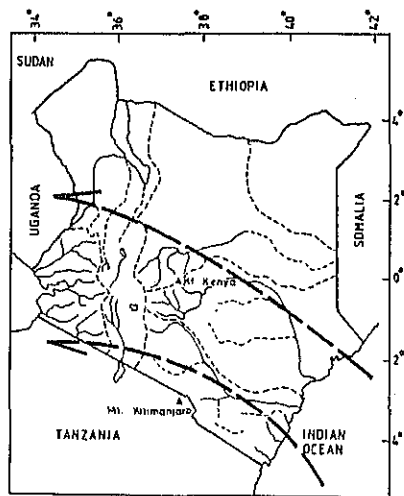
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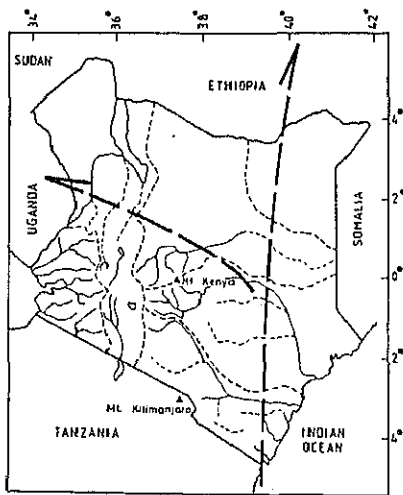
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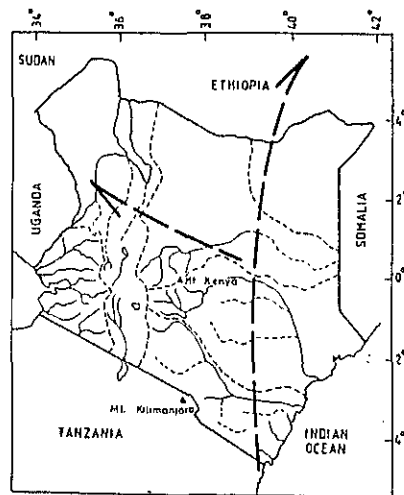
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Figure B1.2
Surface Wind Movement (1/2)

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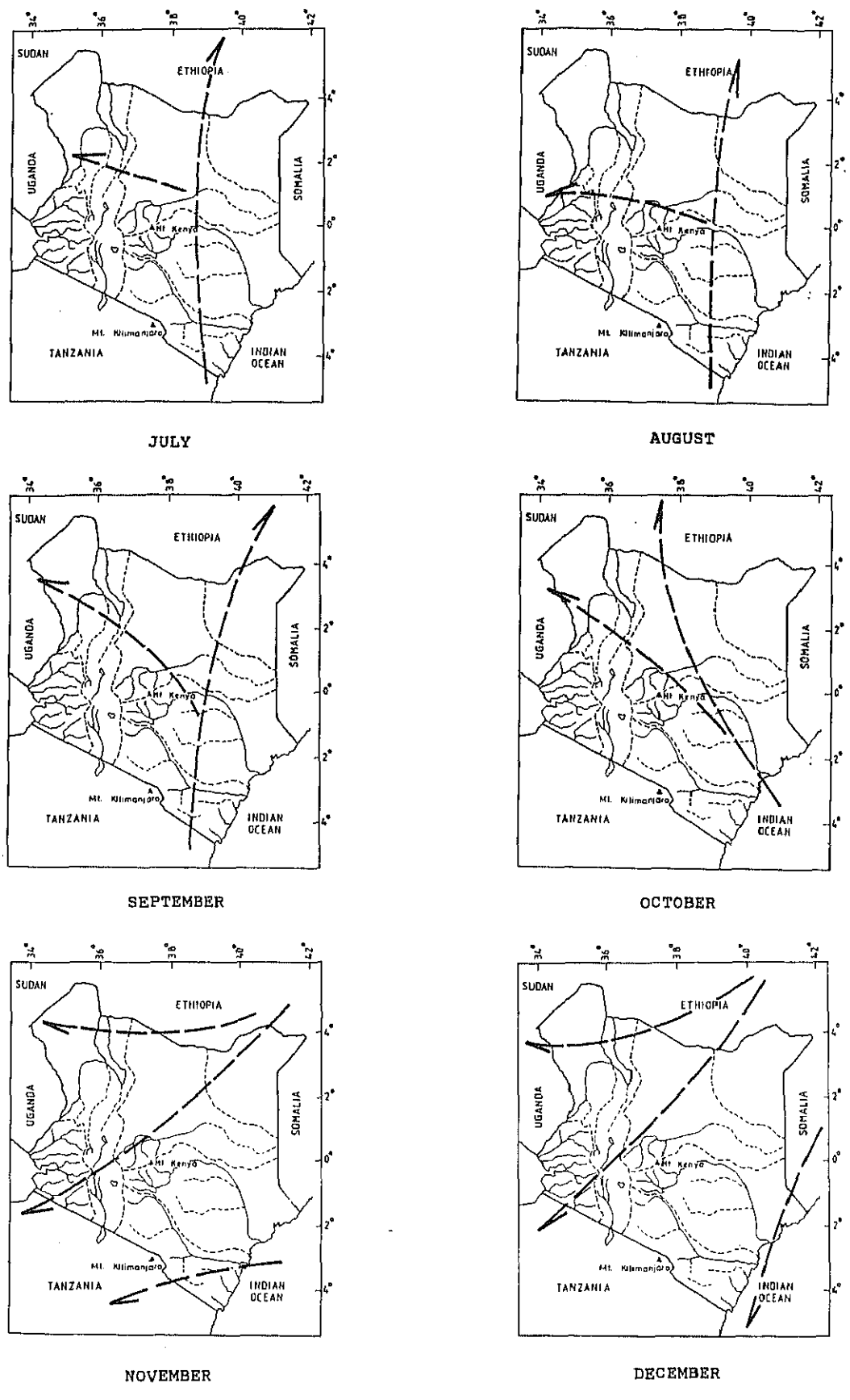


Figure B1.2
Surface Wind Movement (2/2)

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ON
THE NATIONAL WATER MASTER PLAN
JAPAN INTERNATIONAL COOPERATION AGENCY

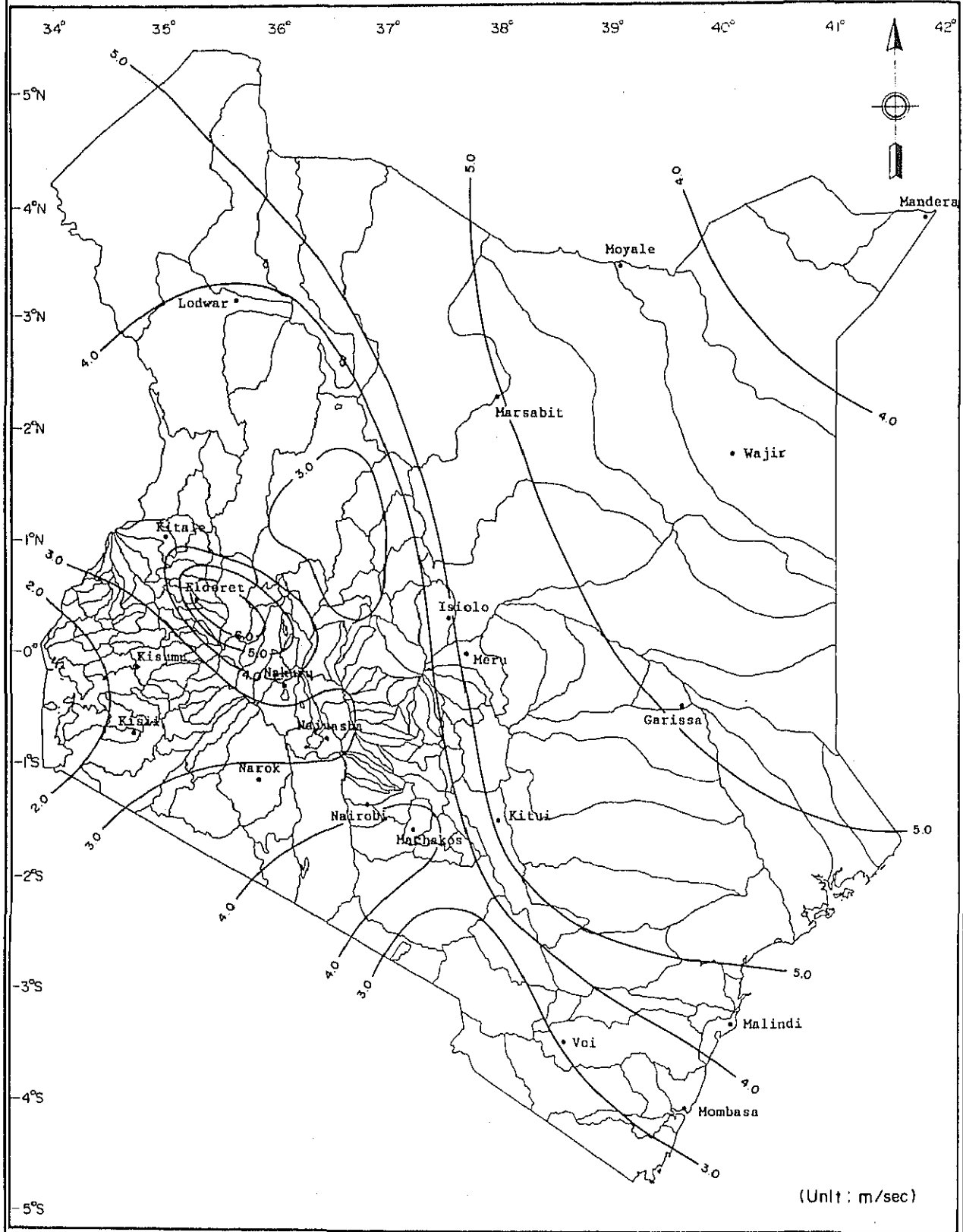


Figure B1.3 Annual Mean Surface Wind Speed

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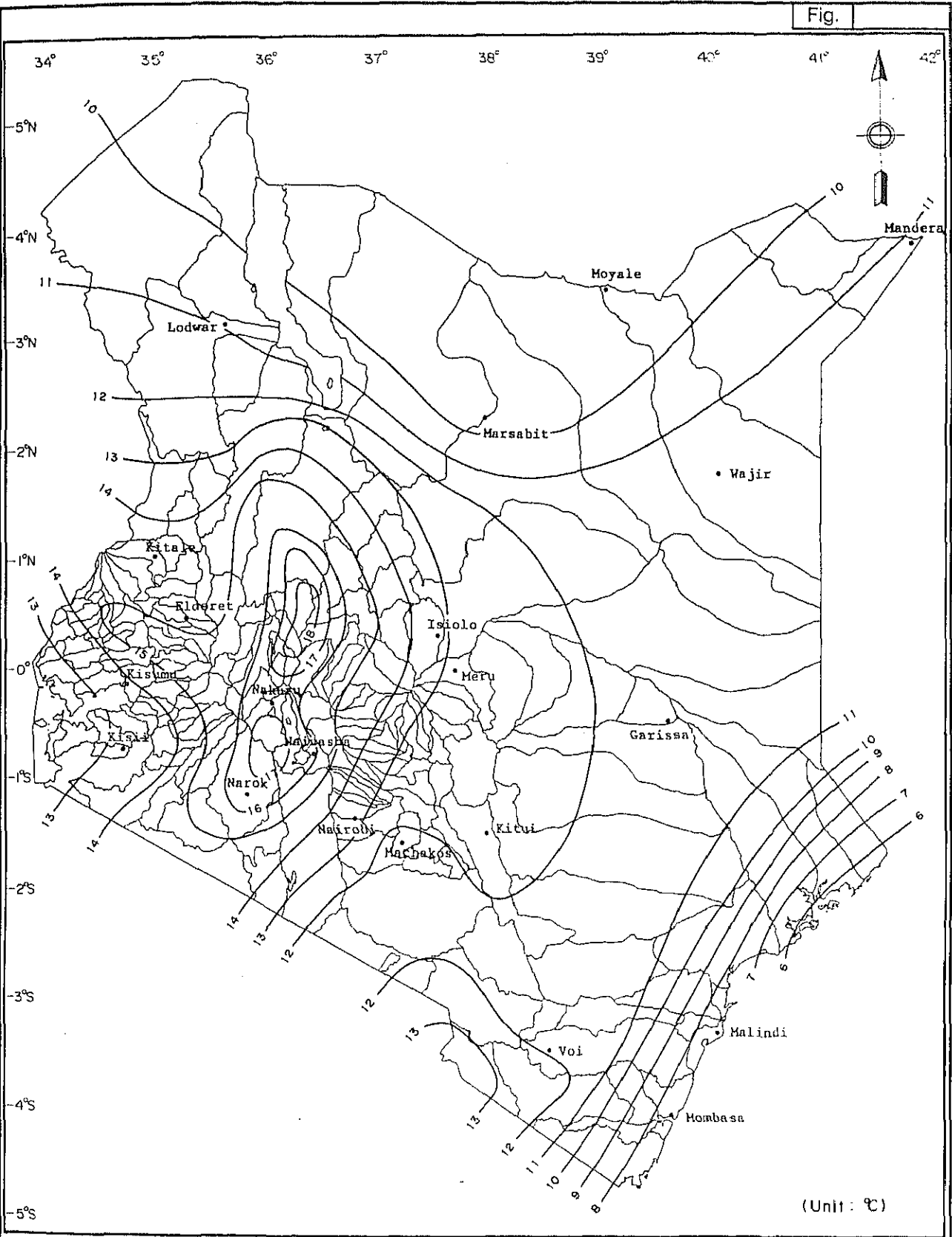


Figure B1.4 Diurnal Temperature Change

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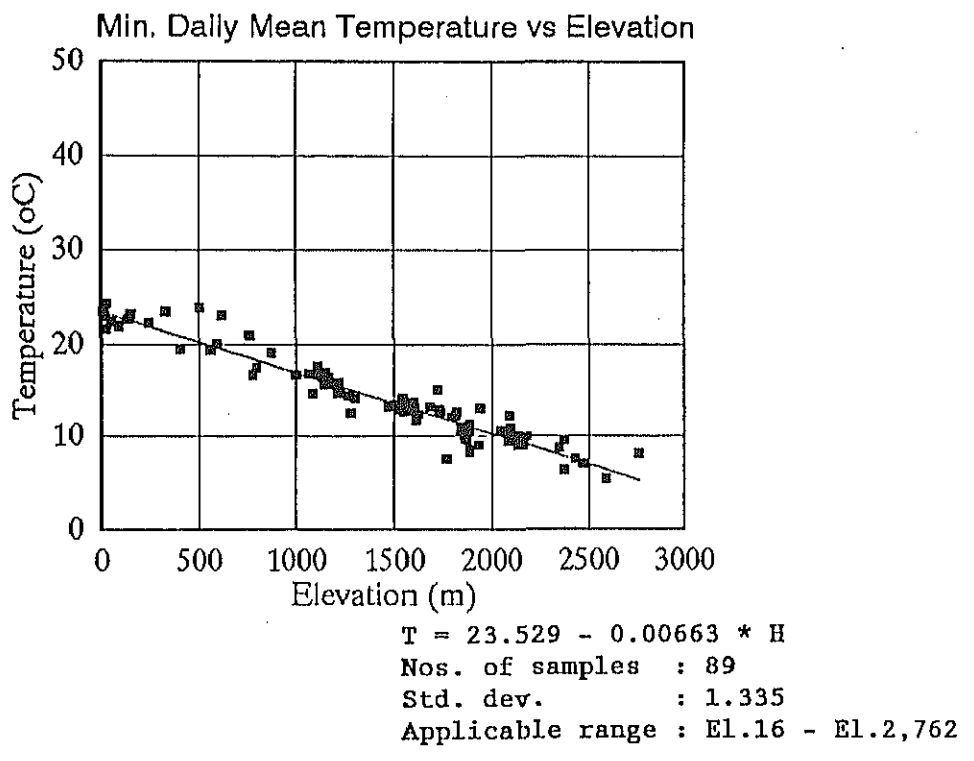
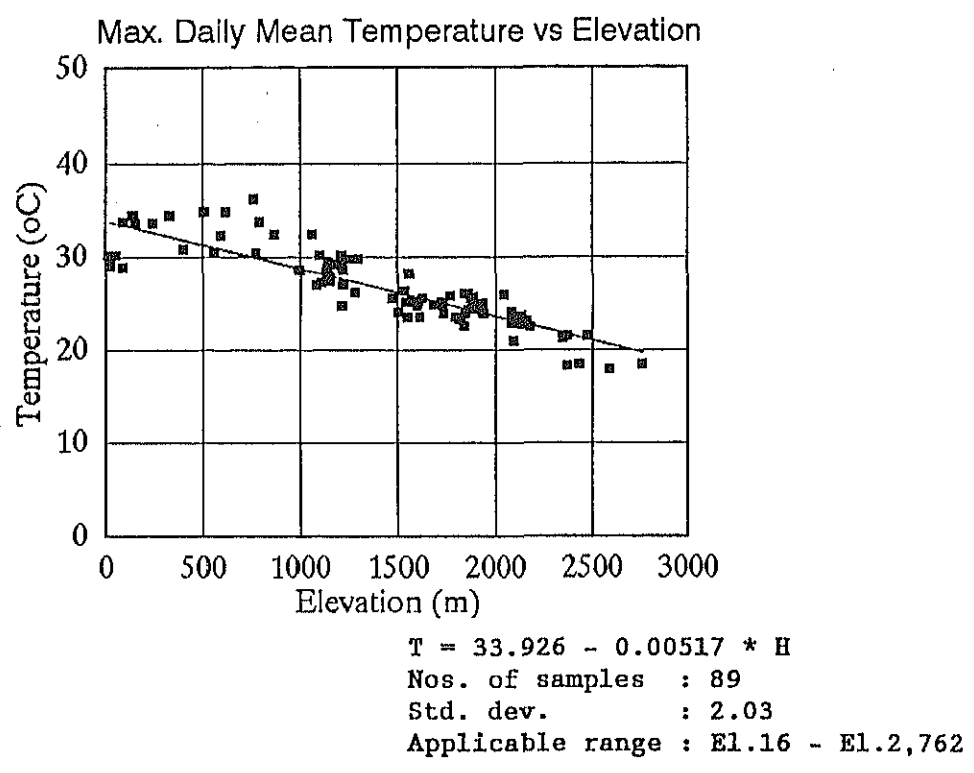


Figure B.1.5 Relationship between Temperature and Elevation (1/2)

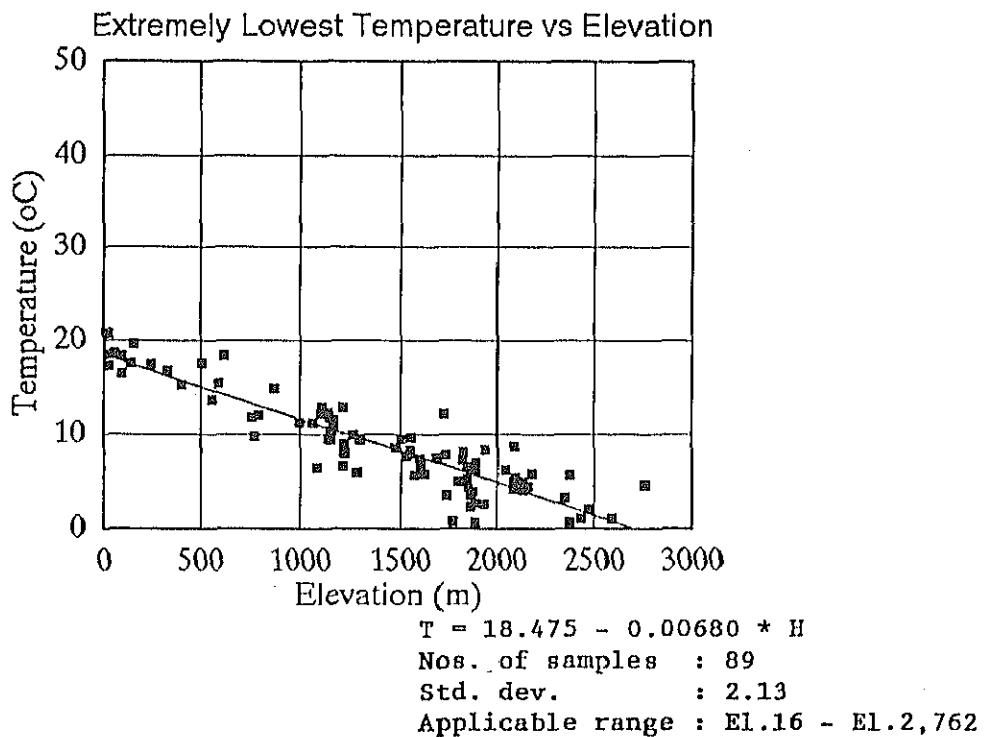
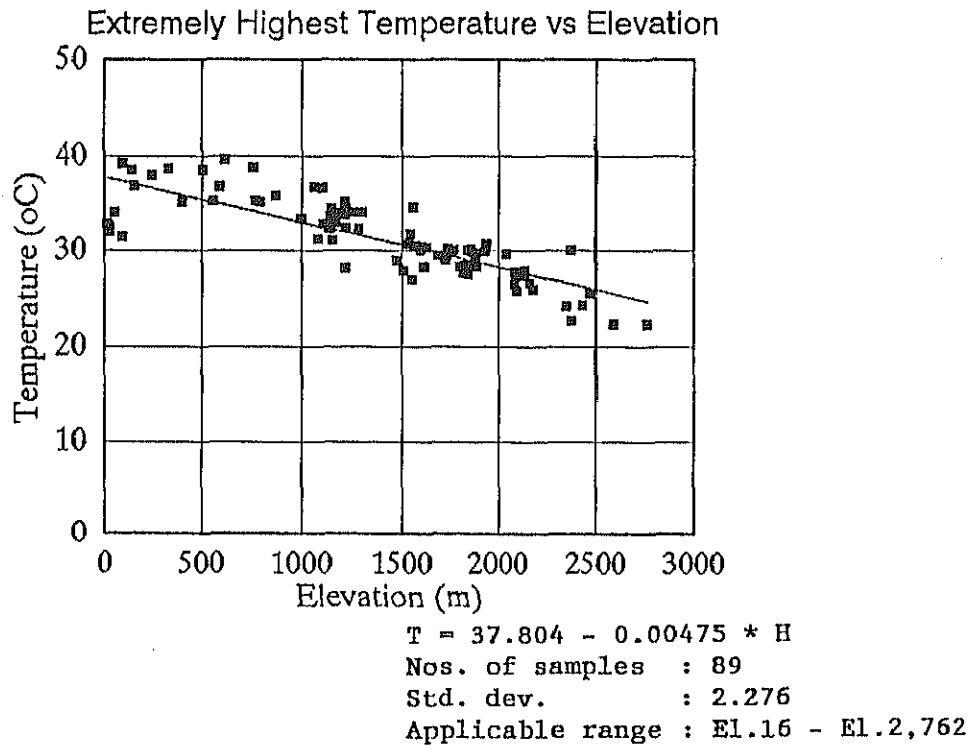


Figure B1.5 Relationship between Temperature and Elevation (2/2)

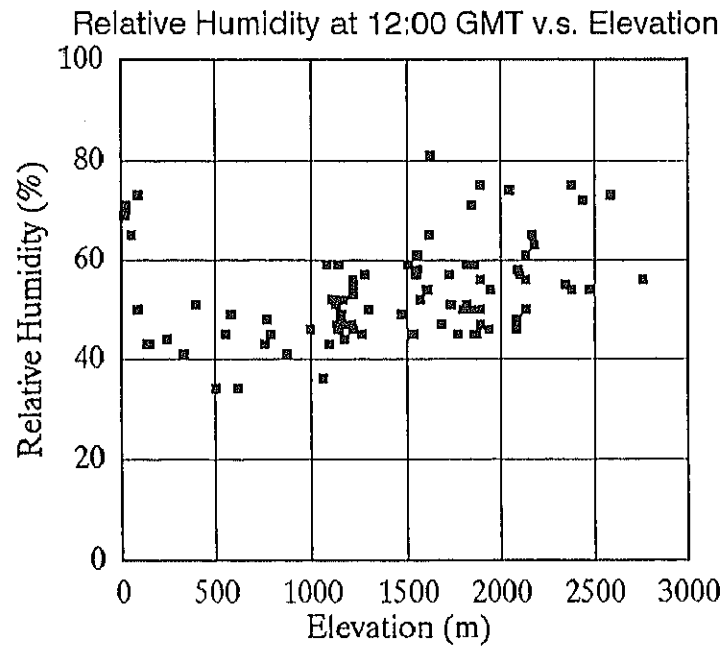
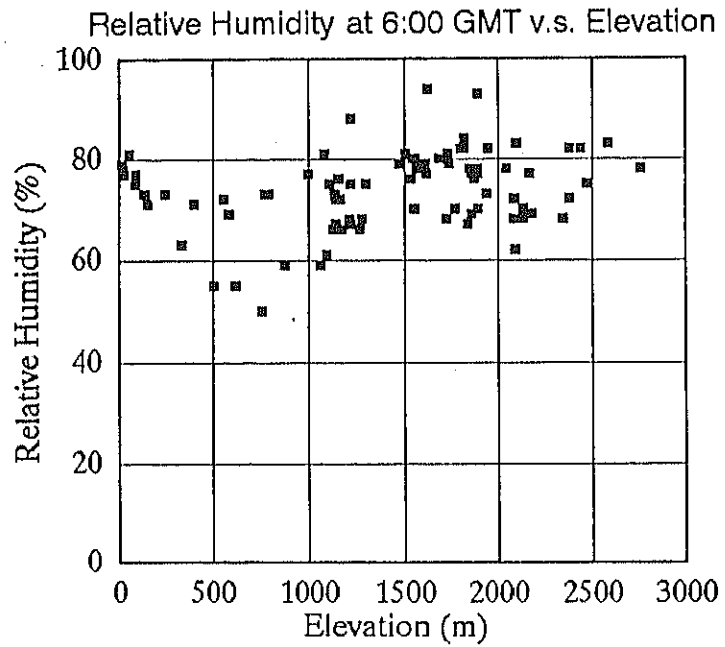
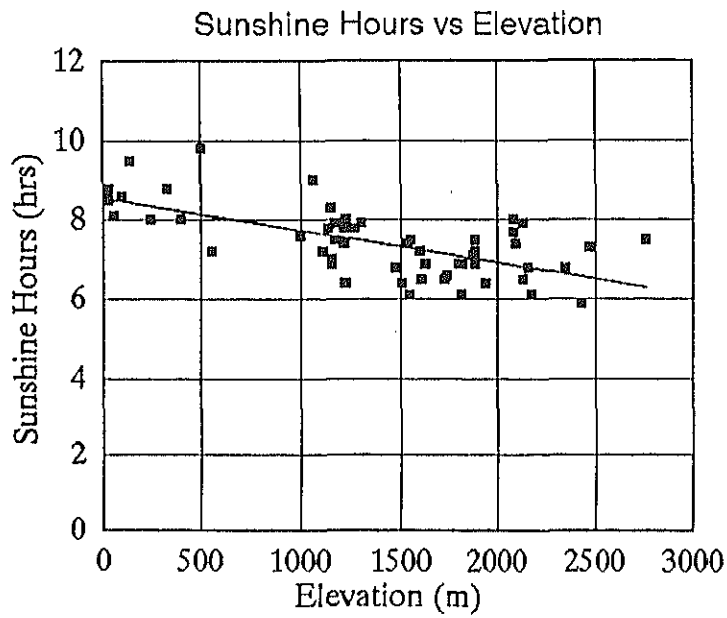


Figure B1.6 Relationship between Relative Humidity and Elevation



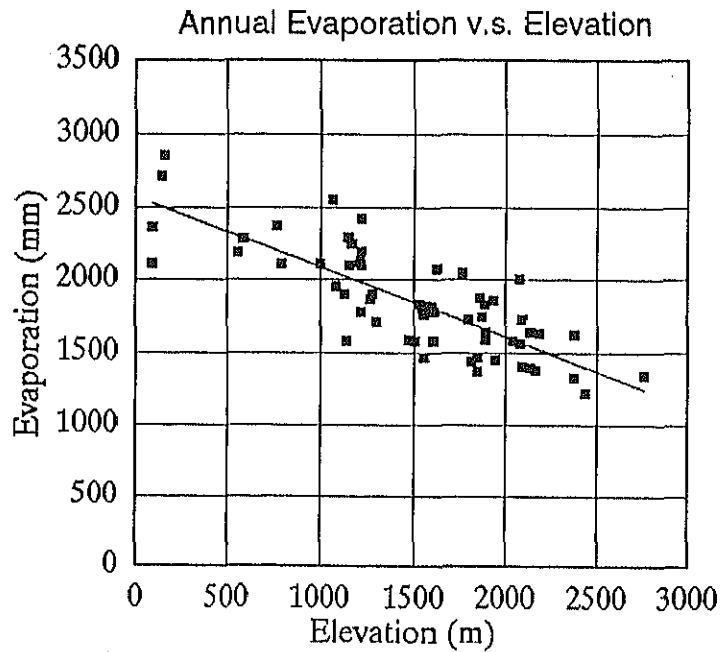
$$SH = 8.557 - 0.00081 * H$$

Nos. of samples : 56

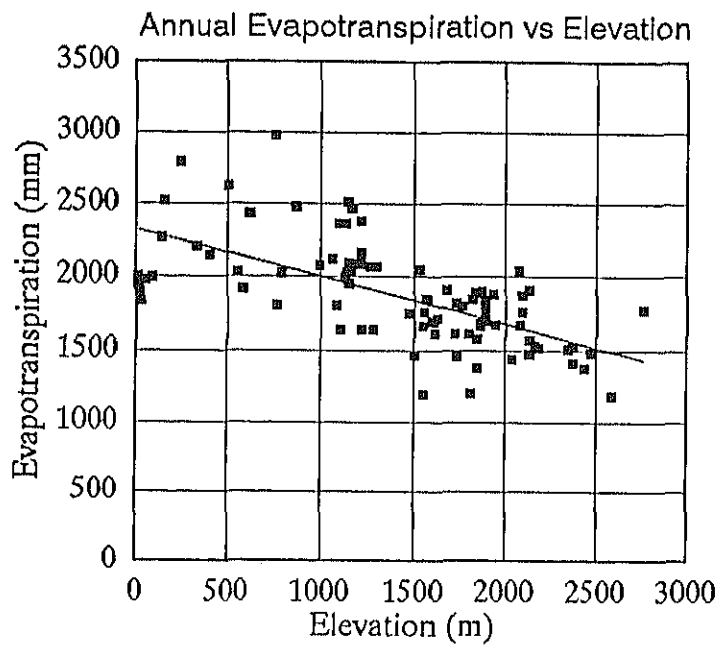
Std. dev. : 0.650

Applicable range : El.20 - El.2,762

Figure B1.7 Relationship between Sunshine Hours and Elevation



$E_o = 2,575 - 0.4838 * H$
 Nos. of samples : 60
 Std. dev. : 216
 Applicable range : El.91 - El.2,762



$E_{To} = 2,330 - 0.03235 * H$
 Nos. of samples : 88
 Std. dev. : 272
 Applicable range : El.16 - El.2,762

Figure B1.8 Relationship between Evaporation and Elevation

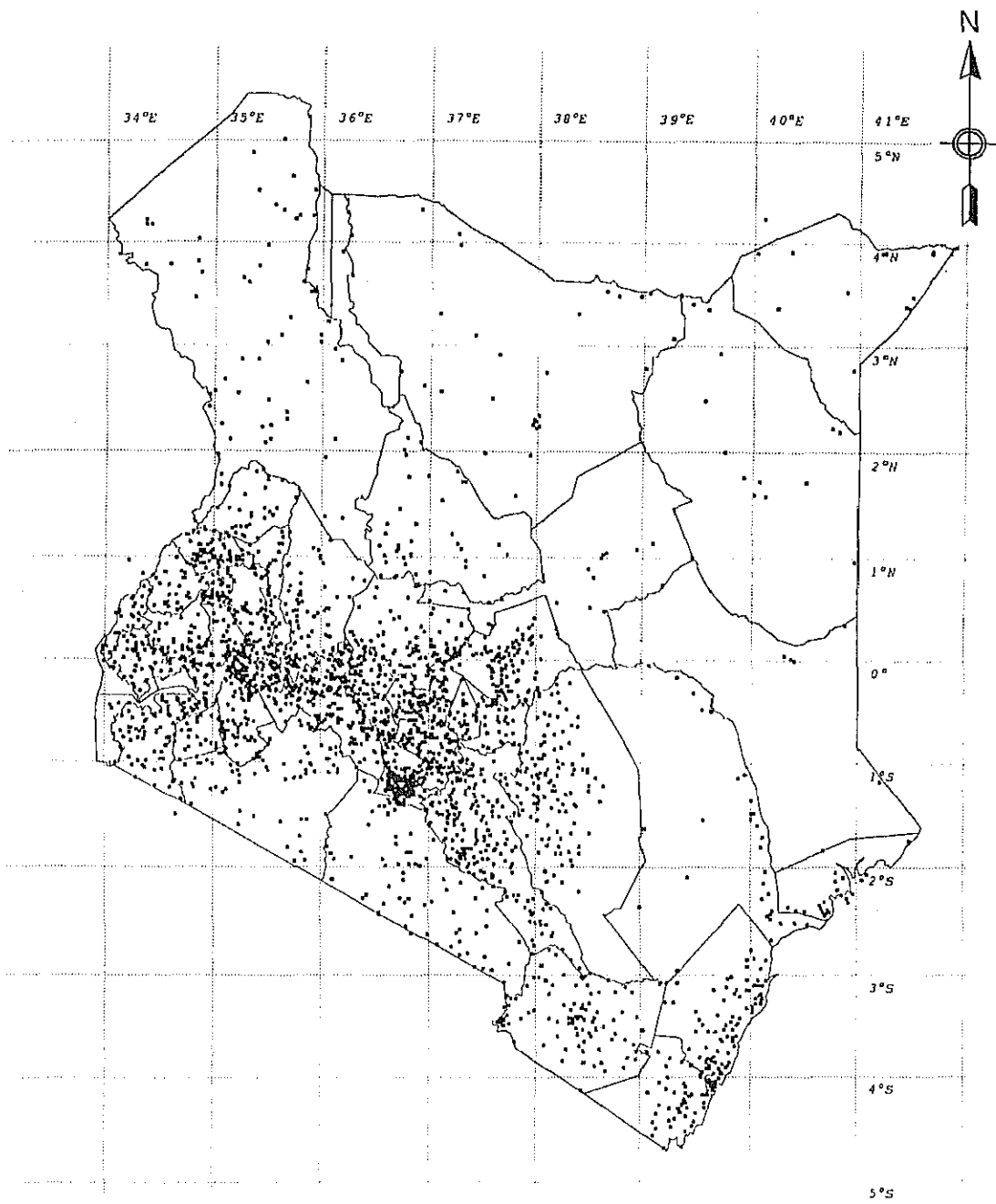
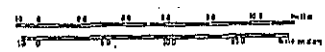


Figure B 2.1 Registered Rainfall Gauging Stations



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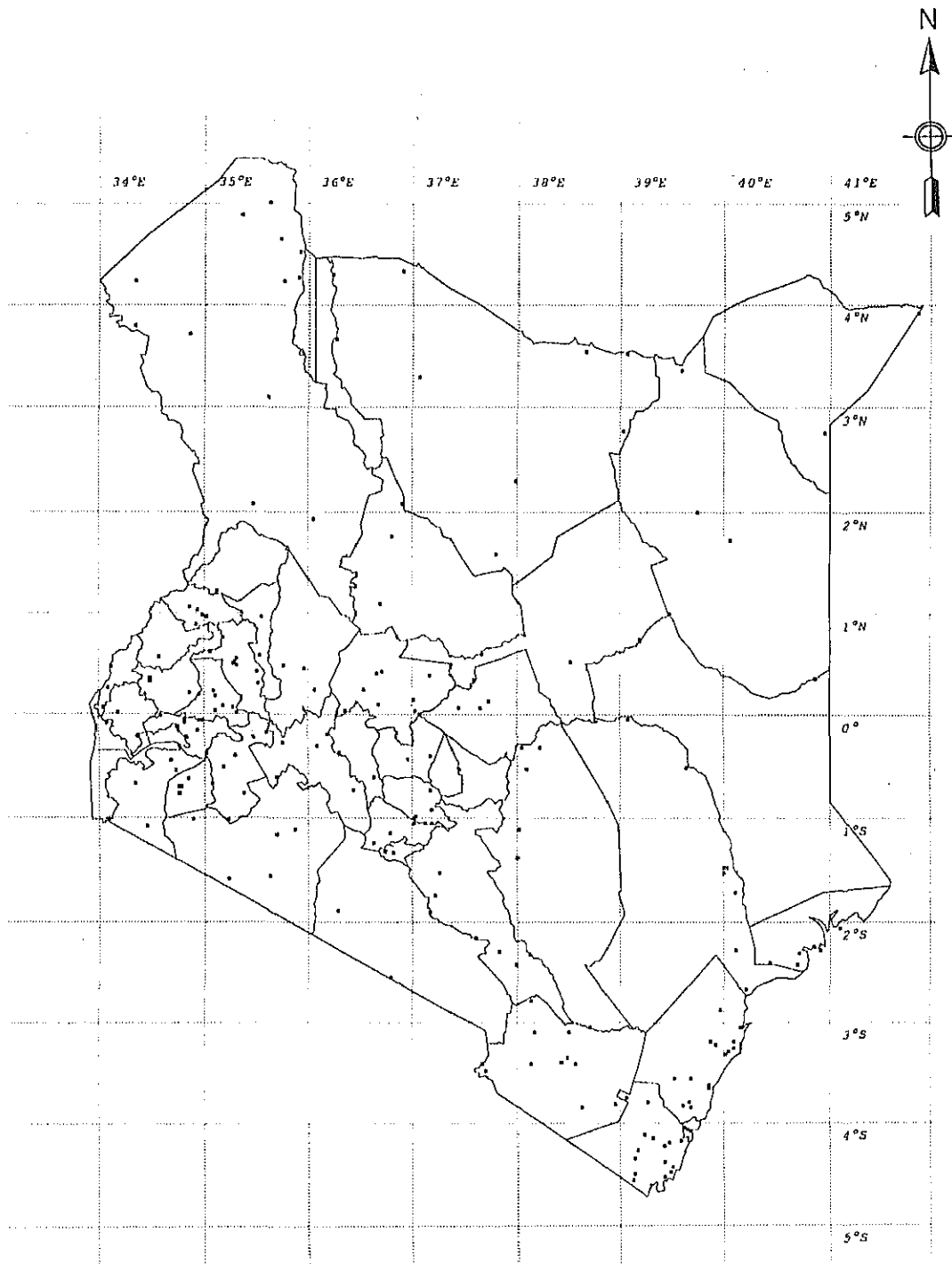
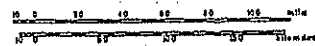


Figure B2.2 Selected 212 Rainfall Gauging Stations



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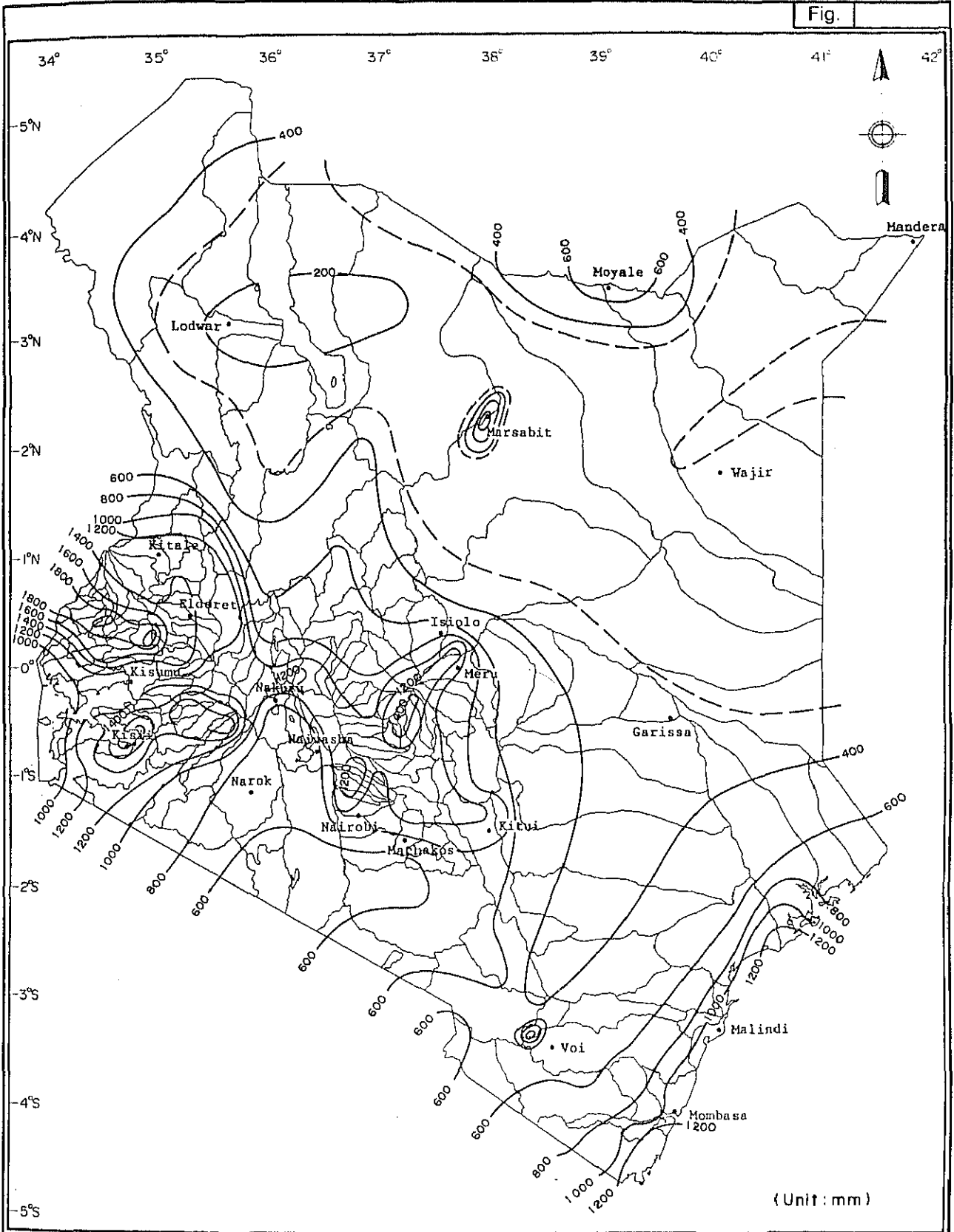


Figure B2.3 Isohyetal Map of Annual Rainfall Depth

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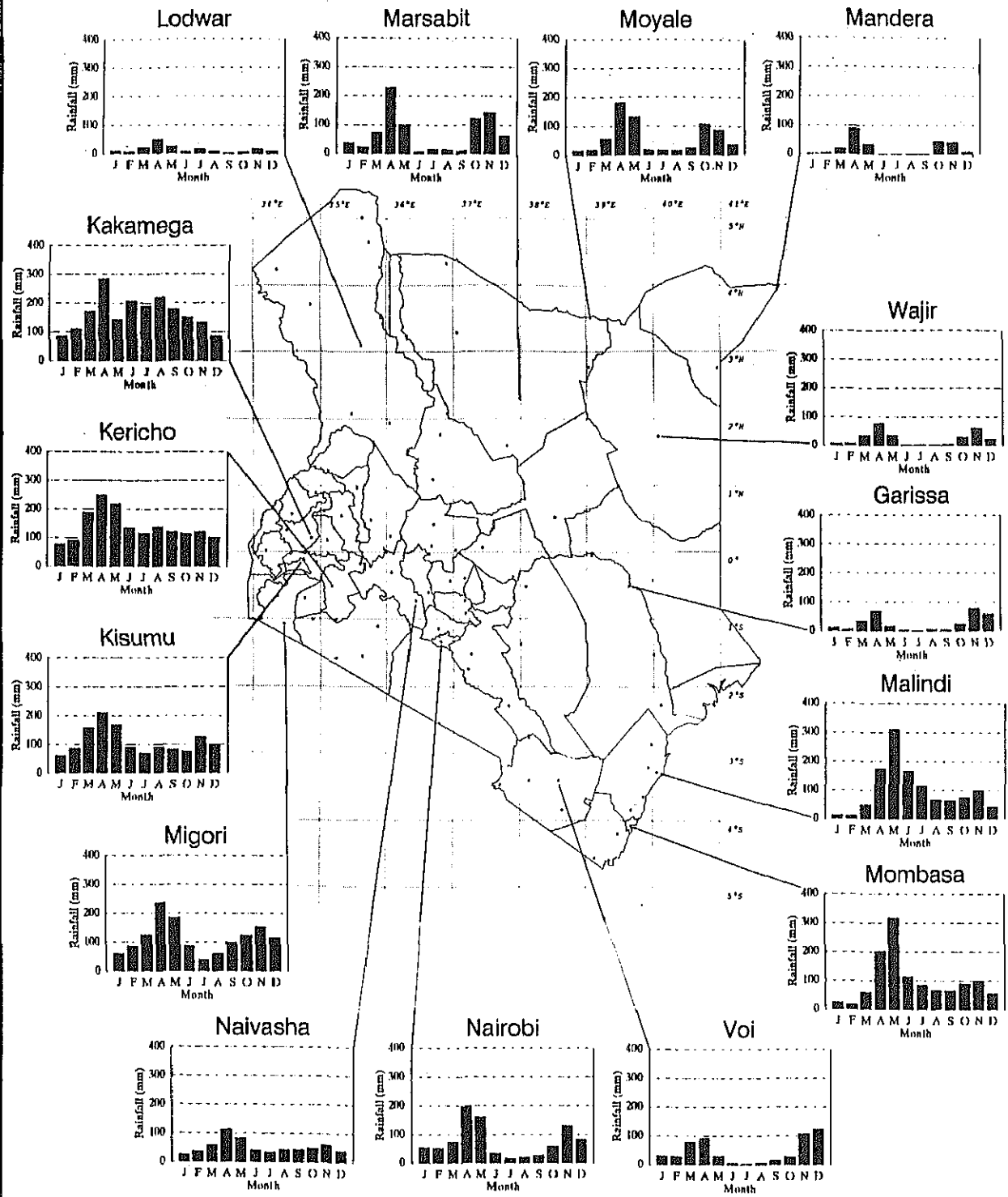


Figure B2.4 Monthly Rainfall Depth at Representative Rainfall Gauging Stations

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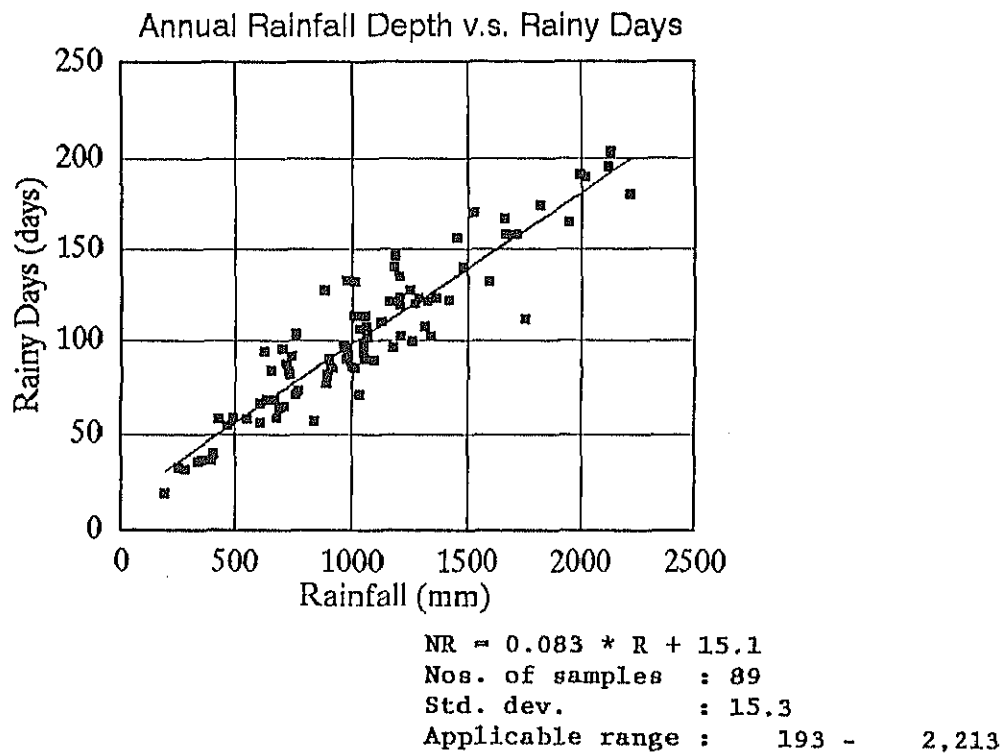
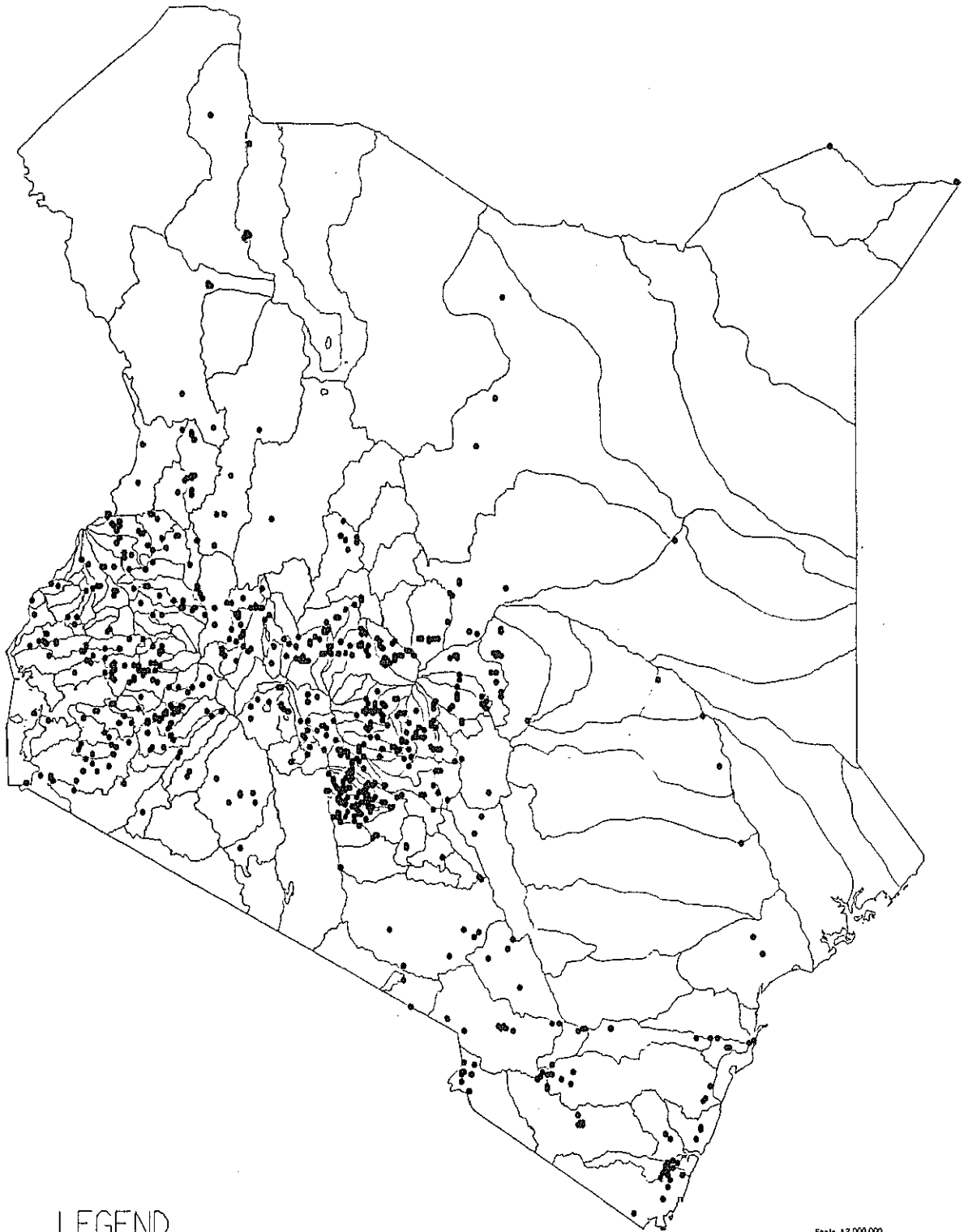


Figure B2.5 Relationship between Annual Rainy Days and Annual Rainfall Depth



LEGEND

- Water Level Gauging Station

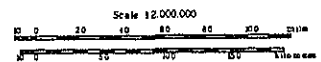


Figure B3.1 Registered Water Level Gauging Stations

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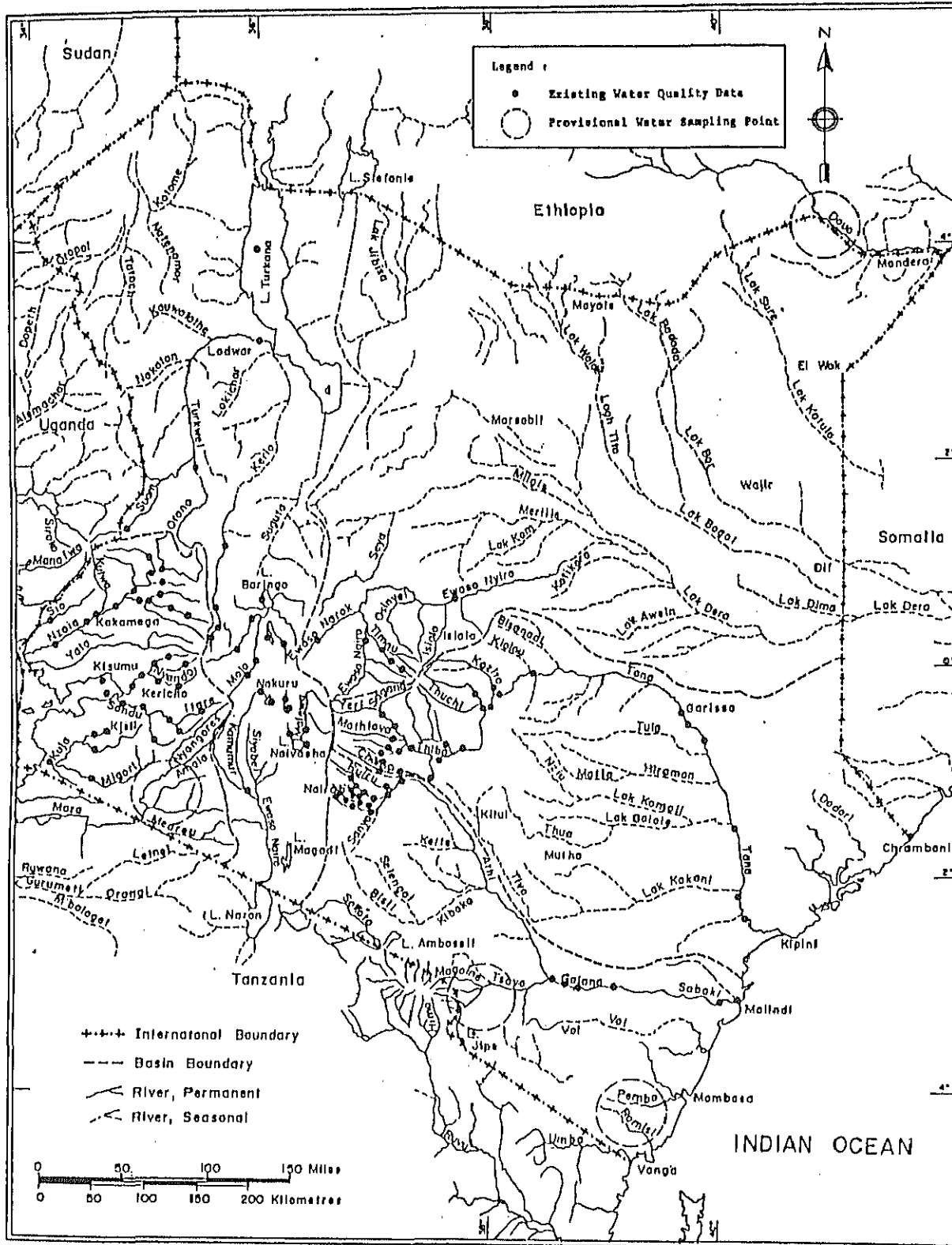


Figure B3.2 Water Quality Sampling Point by MOWD

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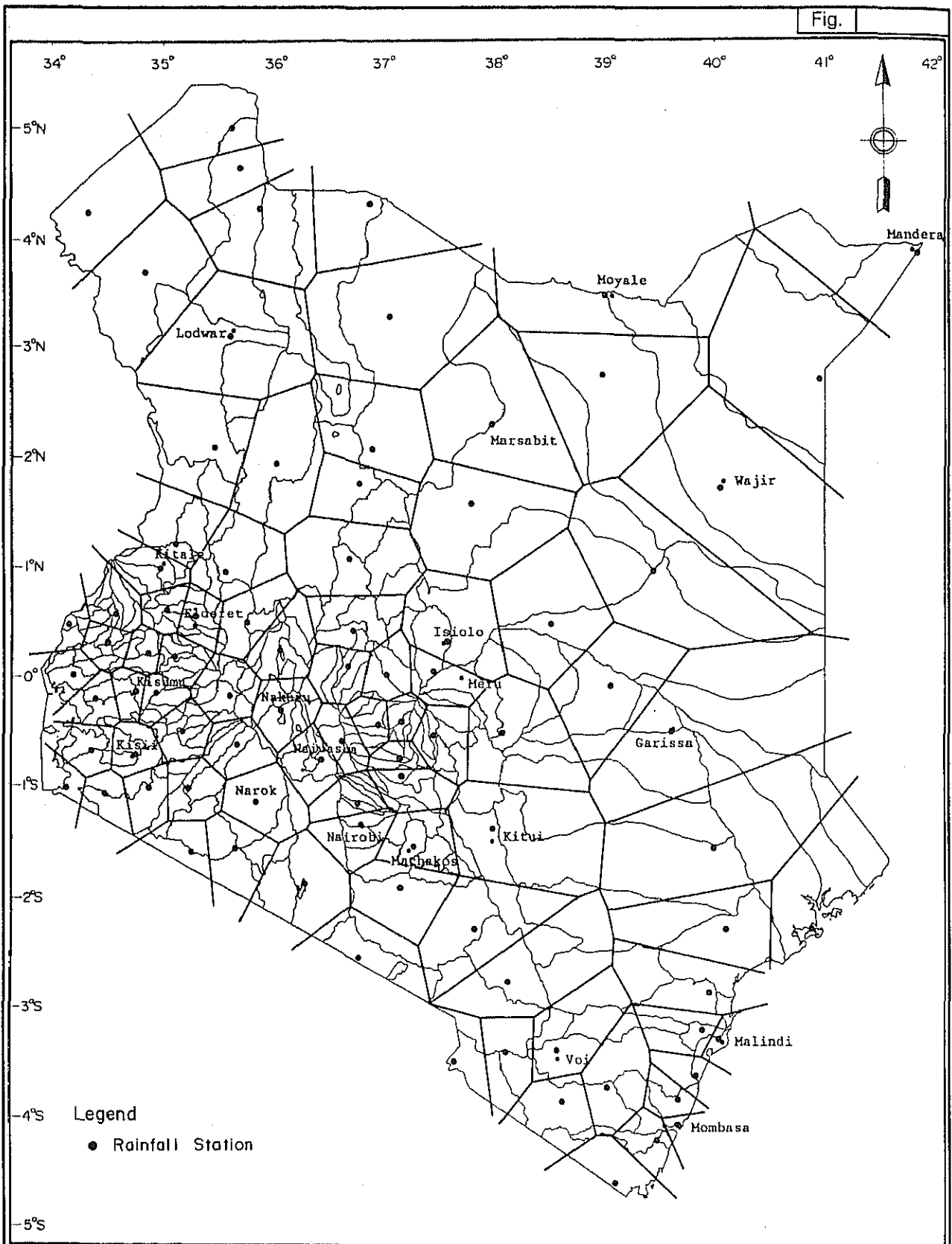
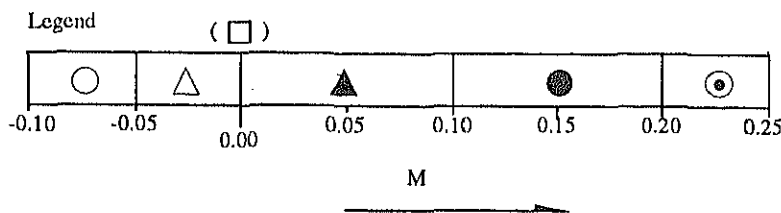


Figure B5.1 Thiessen's Polygon

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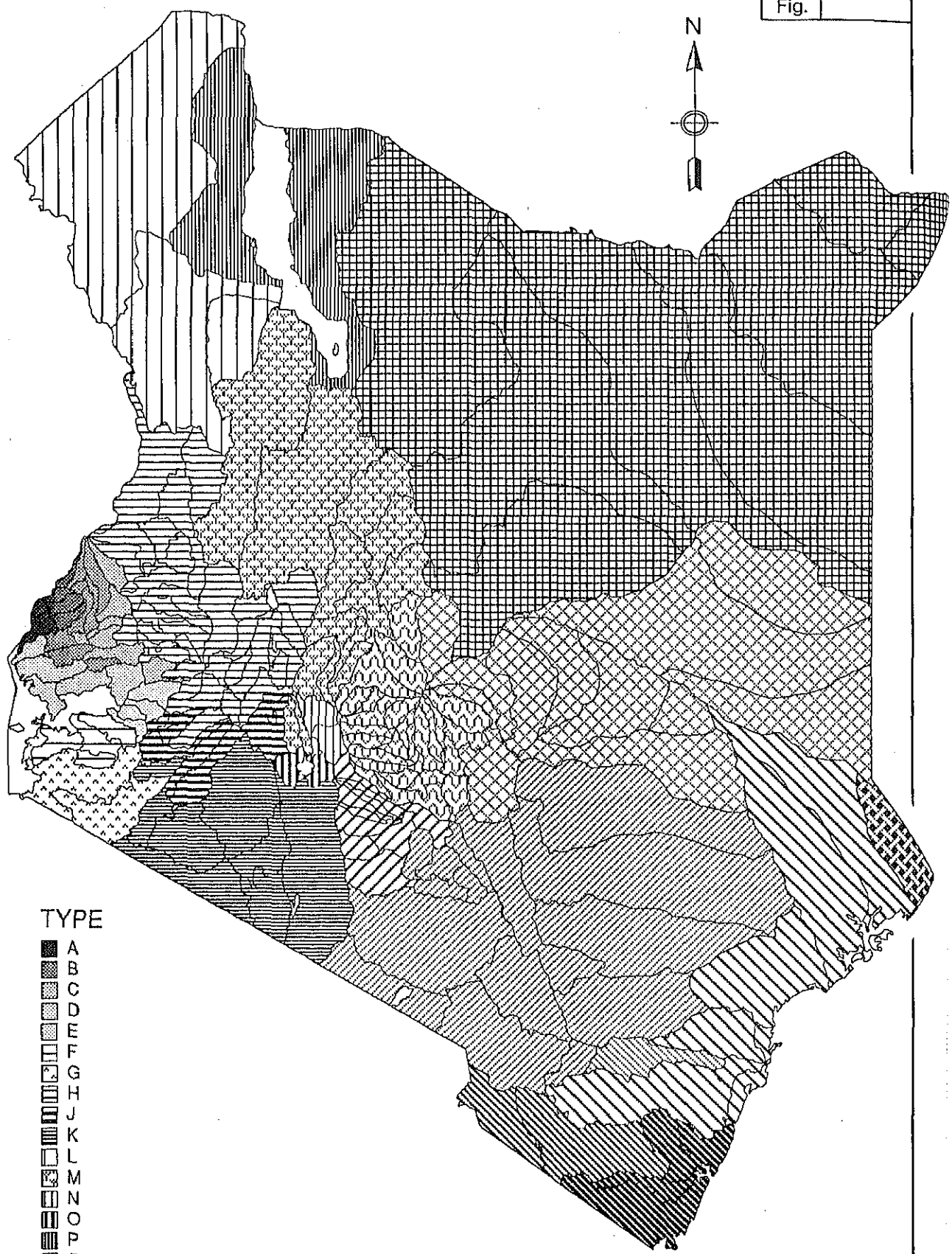
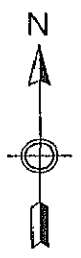
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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
A	min ○	△	▲	max ▲	▲	△	△	△	▲	▲	▲	△	1398.3
B	min △	△	▲	max ▲	▲	△	△	△	△	△	▲	△	1369.3
C	min △	△	▲	max ▲	▲	▲	△	▲	□	△	△	△	1477.9
D	△	△	▲	max ▲	▲	△	min △	△	△	△	▲	△	978.6
E	min △	△	▲	max ▲	▲	△	△	△	△	△	▲	△	1171.7
F	min △	△	▲	max ▲	▲	△	△	△	▲	▲	▲	△	1355.8
G	△	△	▲	max ▲	▲	△	min △	△	△	□	▲	△	1171.1
H	min ○	△	△	max ▲	▲	▲	▲	▲	△	△	△	△	940.8
J	△	min △	▲	max ▲	▲	△	△	▲	△	△	△	△	1130.0
K	□	△	▲	max ▲	▲	△	min △	△	△	△	▲	▲	712.1
L	min ○	△	▲	max ●	▲	△	▲	△	△	△	▲	△	319.5
M	min △	△	△	max ▲	▲	△	▲	▲	△	△	▲	△	512.4
N	min △	△	△	max ▲	▲	△	△	□	□	□	▲	△	820.7
O	min △	△	▲	max ●	▲	△	△	△	○	△	▲	△	551.0
P	△	△	▲	max ●	▲	○	△	○	min ○	△	▲	△	253.4
Q	△	△	▲	max ●	▲	△	min ○	△	○	▲	▲	△	796.8
R	△	△	▲	max ●	▲	△	min ○	○	○	△	▲	▲	812.8
S	△	△	▲	max ●	△	○	min ○	○	○	△	max ●	▲	580.3
T	○	○	▲	max ⊙	▲	○	○	min ○	○	▲	▲	△	329.1
U	△	○	▲	max ●	△	○	min ○	○	○	▲	max ●	▲	370.6
V	○	min ○	△	▲	max ⊙	▲	▲	△	△	△	△	△	753.0
W	○	min ○	△	▲	●	▲	△	△	△	△	▲	□	563.0
X	△	min ○	▲	▲	▲	△	△	△	△	△	max ▲	▲	554.0
Y	△	△	▲	▲	▲	○	min ○	○	△	△	max ▲	▲	480.9
Z	△	min ○	△	▲	max ●	△	△	△	△	▲	▲	△	795.6



Remark ; $M = (R_m - R_a) / 12 / R_a$

Figure B5.2 Monthly Variation of Basin Mean Rainfall (1)

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TYPE

- A
- ▣ B
- ▤ C
- ▥ D
- ▦ E
- ▧ F
- ▨ G
- ▩ H
- I
- J
- ▬ K
- ▭ L
- ▮ M
- ▯ N
- ▰ O
- ▱ P
- ▲ Q
- △ R
- ▴ S
- ▵ T
- ▶ U
- ▷ V
- W
- X
- Y
- ▻ Z

Figure B5.3 Monthly Variation of Basin Mean Rainfall (2)

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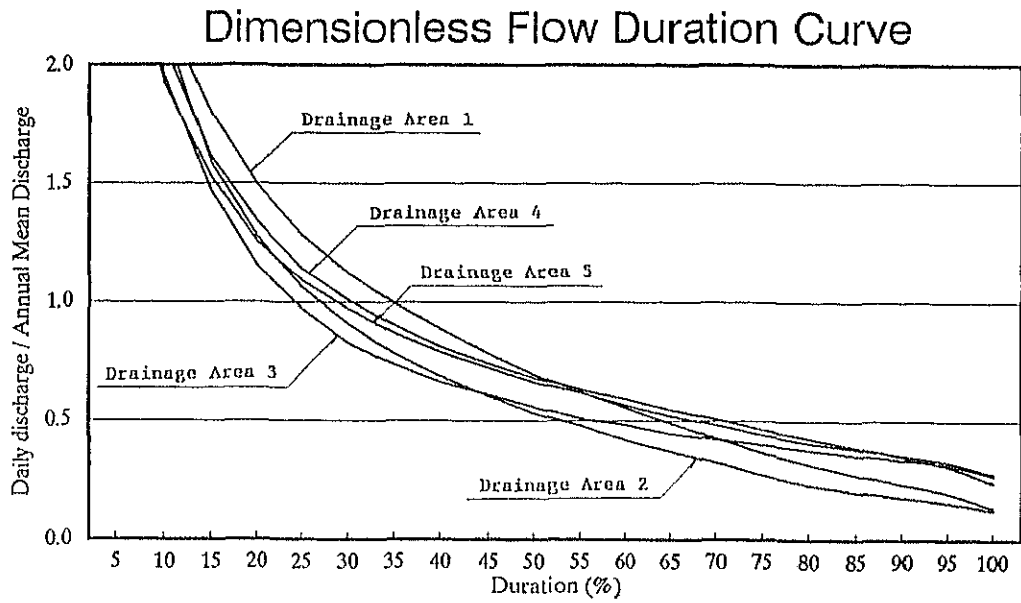


Figure B6.1 Dimensionless Flow Duration Curve by Drainage Area

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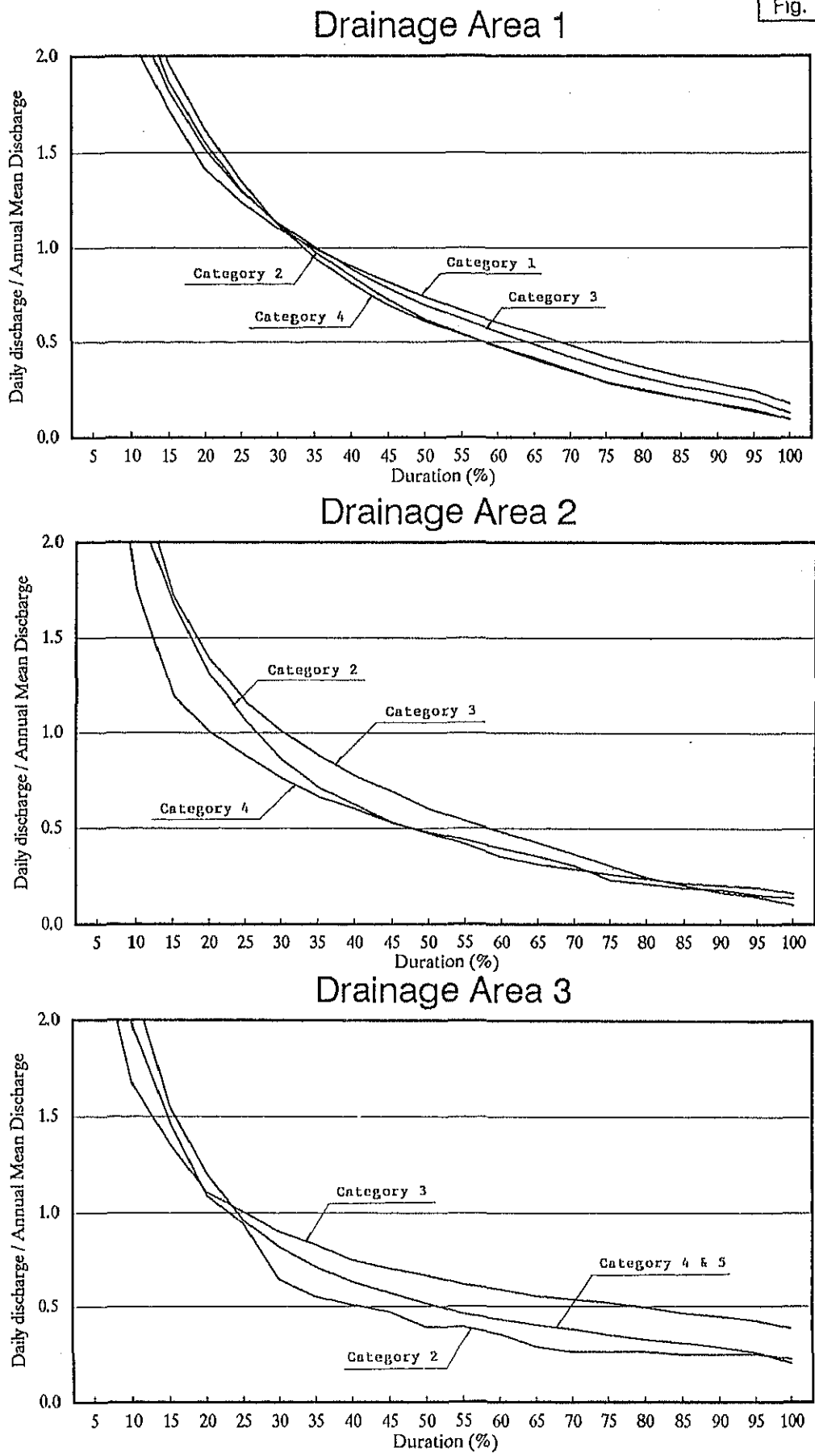


Figure B6.2 Dimensionless Flow Duration Curve by Catchment Area

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JAPAN INTERNATIONAL COOPERATION AGENCY

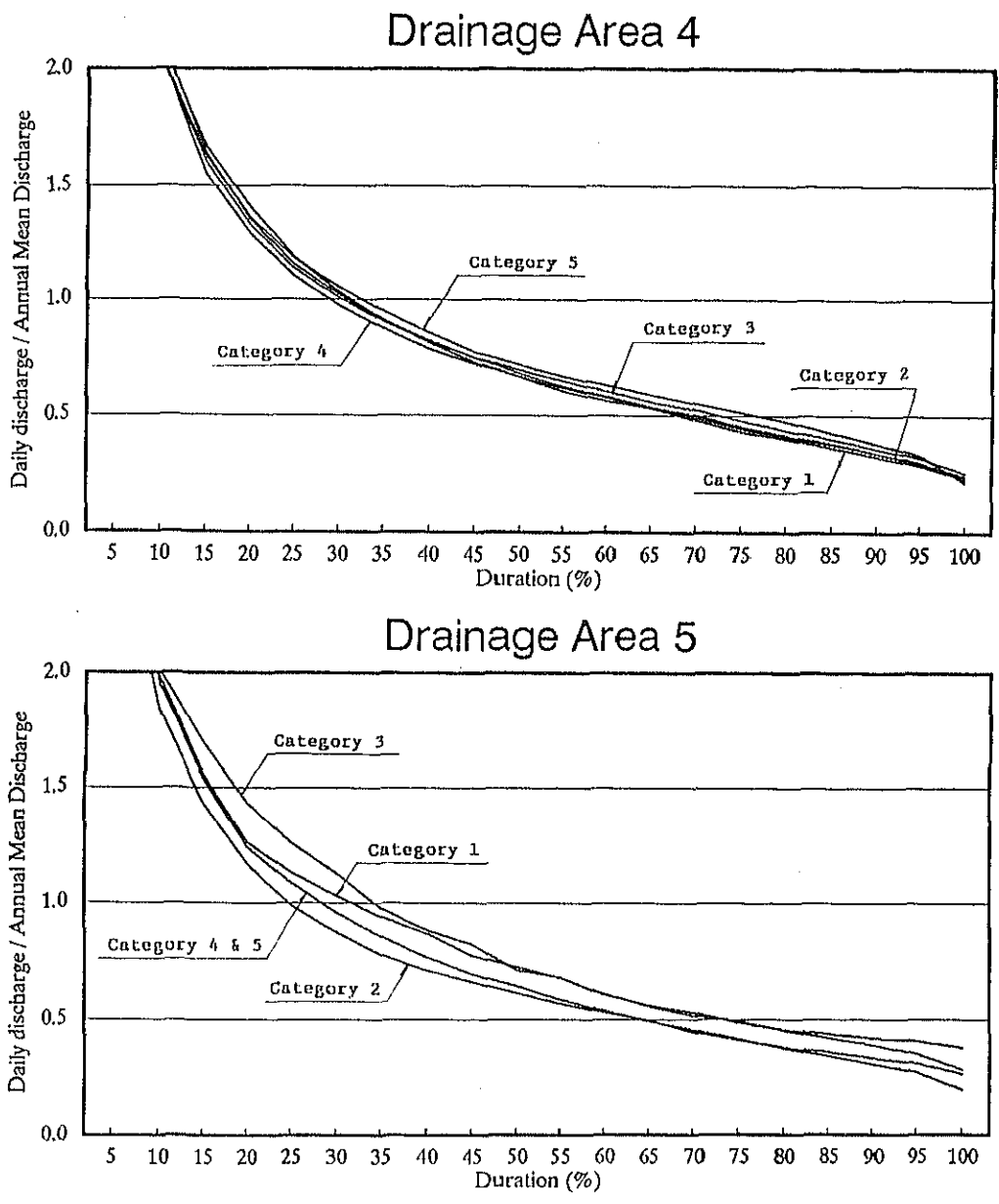


Figure B6.2 Dimensionless Flow Duration Curve by Catchment Area

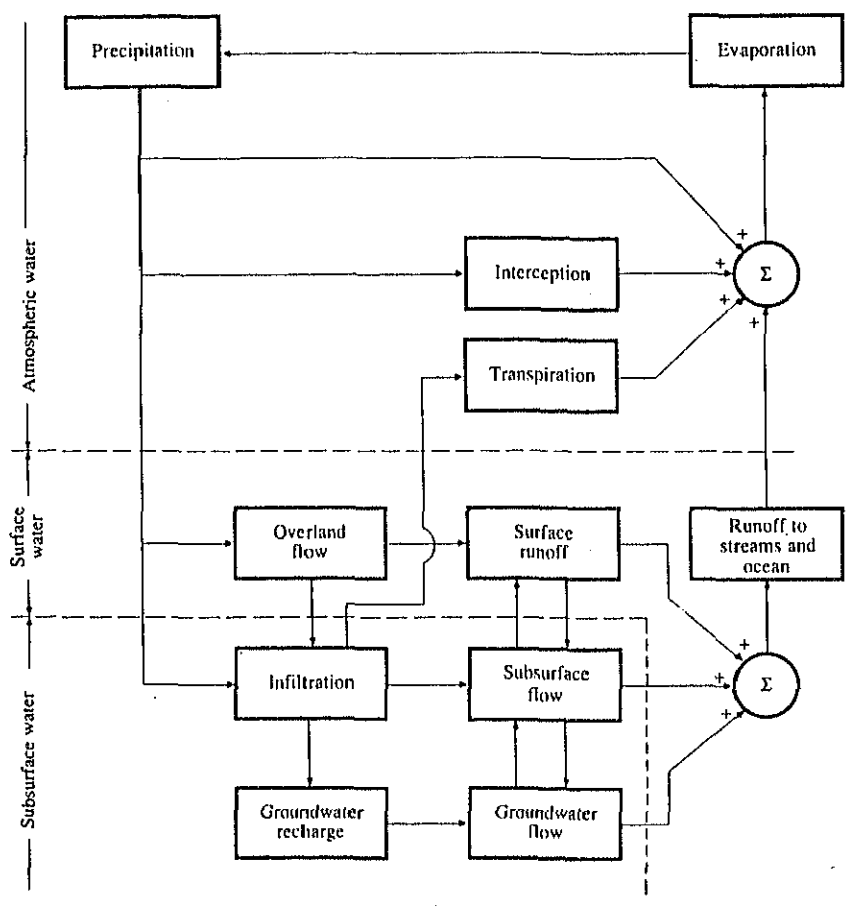


Figure B6.3 Global Hydrologic Cycle

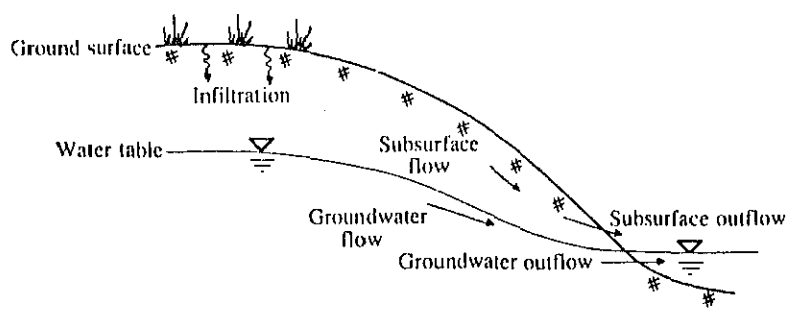


Figure B6.4 Groundwater and Subsurface Outflows

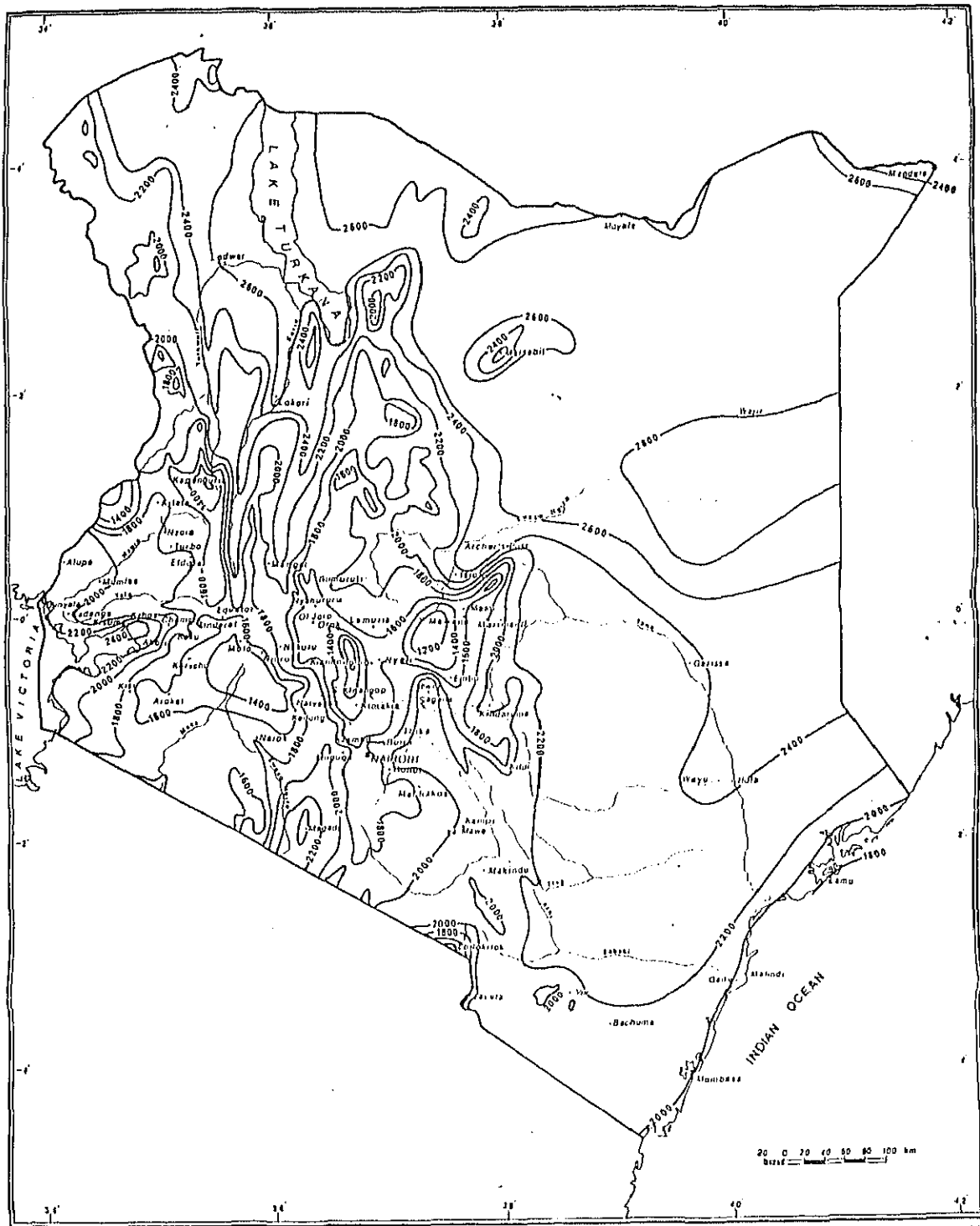
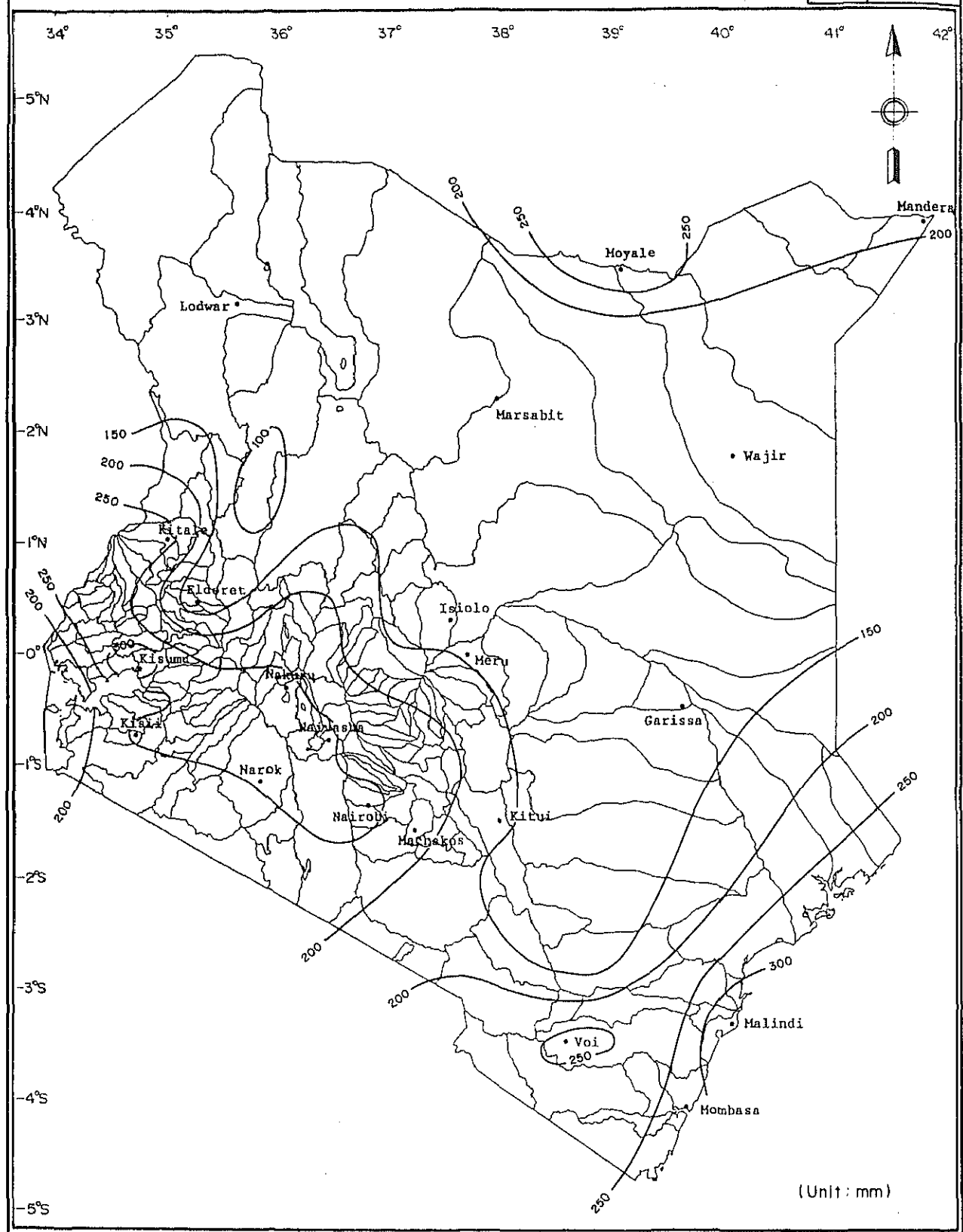


Figure B6.5 Isohyetal Map of Annual Potential Evapotranspiration

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Fig.



(Unit : mm)

Figure B6.6 Groundwater Storage Capacity

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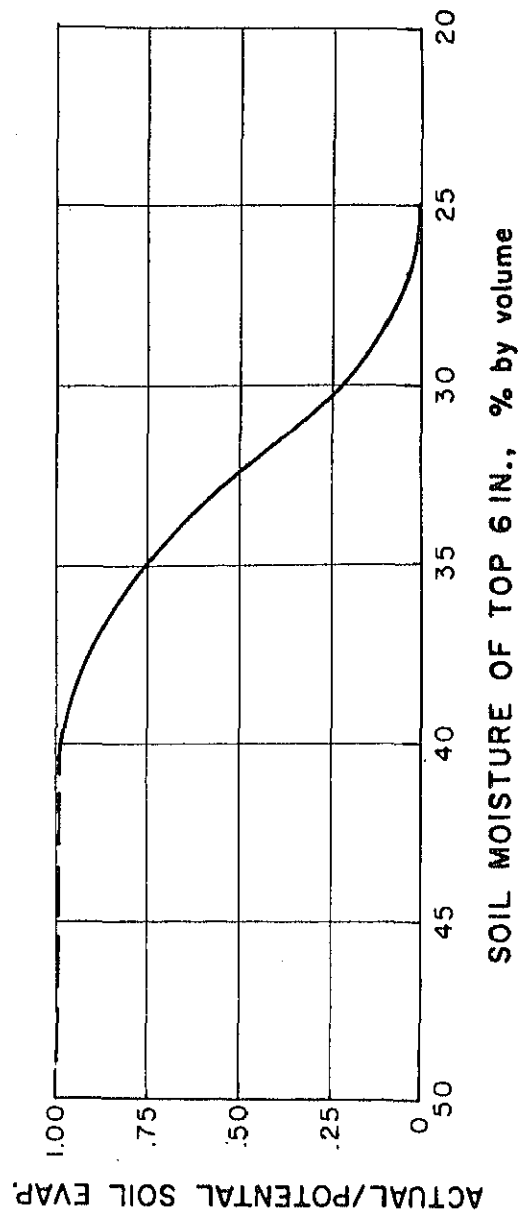


Figure B6.7 Soil Evaporation Relationship

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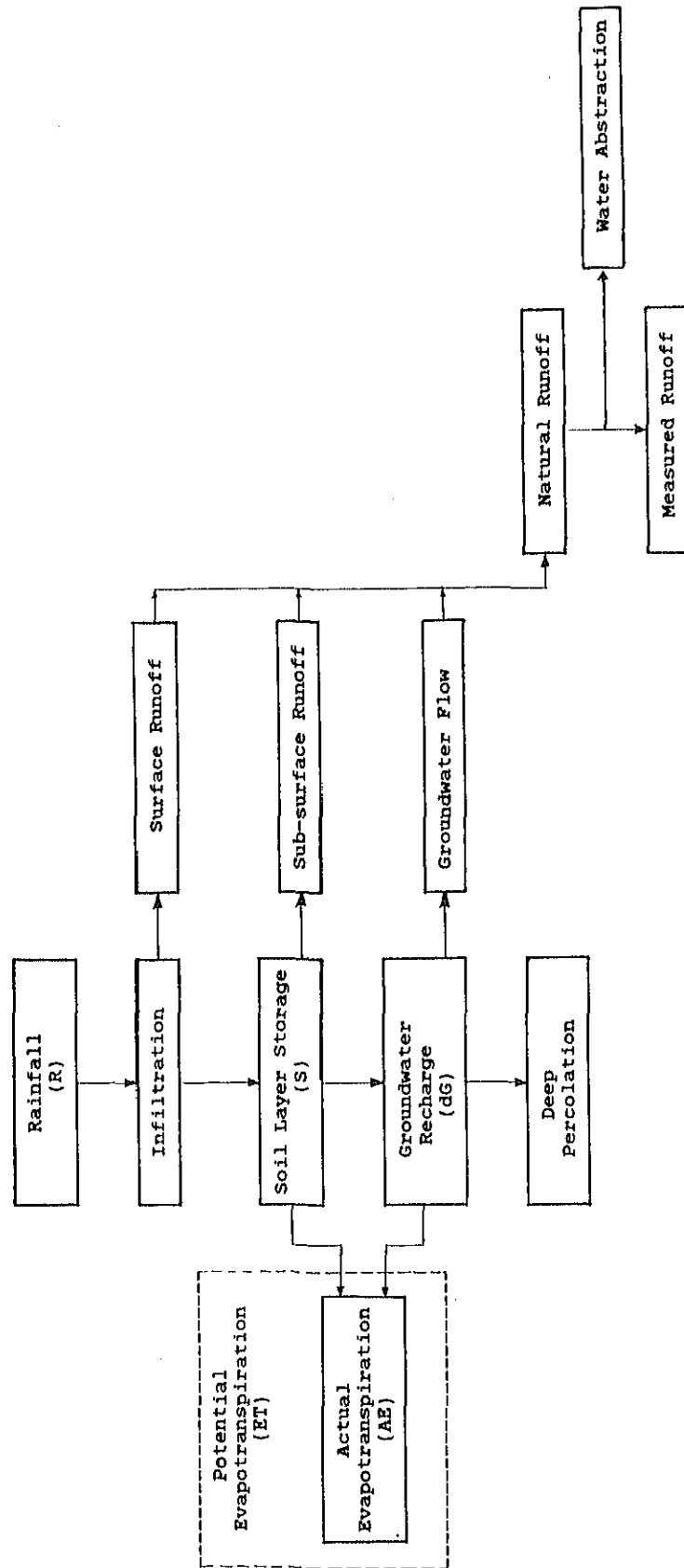


Figure B6.8 Flowchart of Preliminary Water Balance Calculation

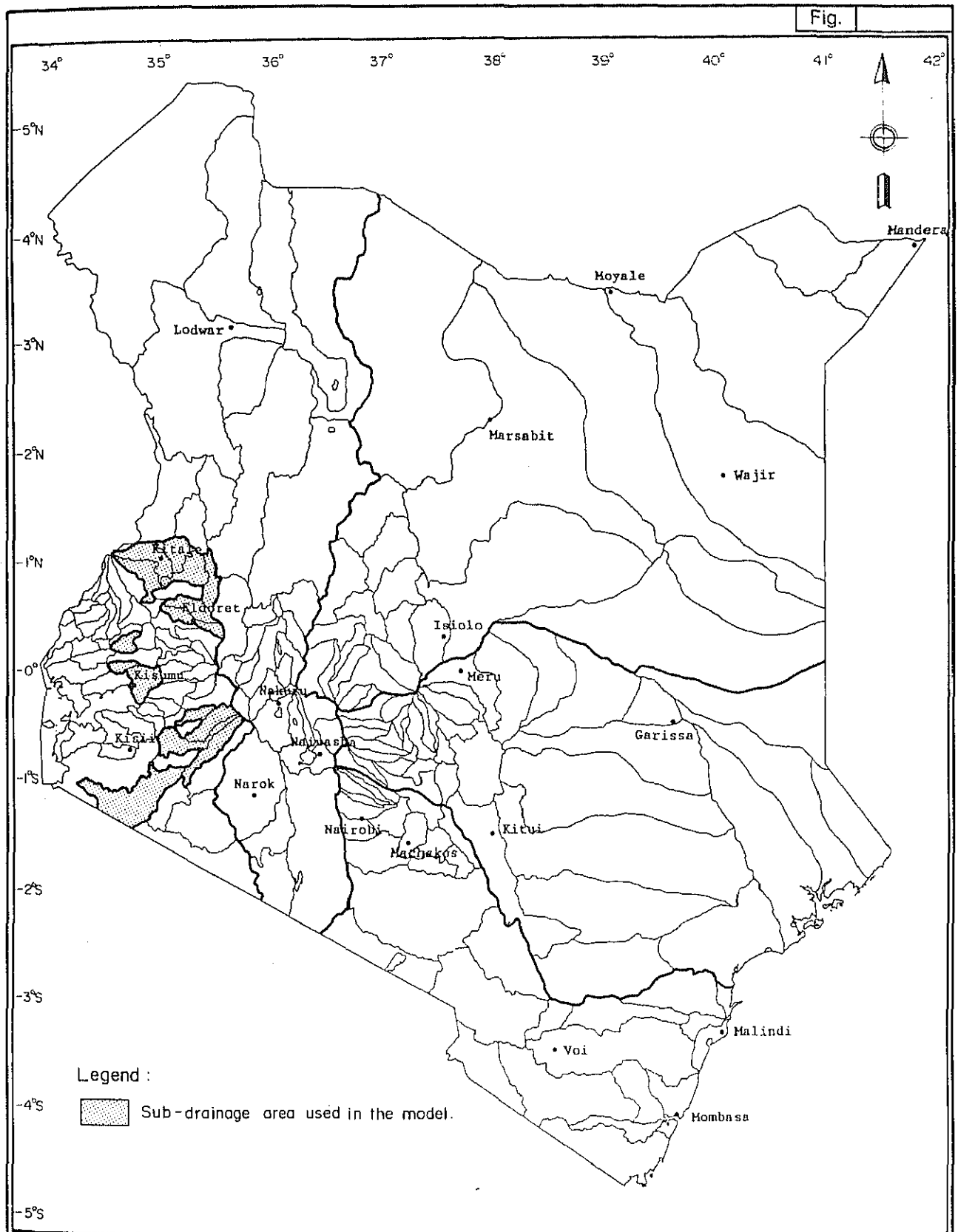
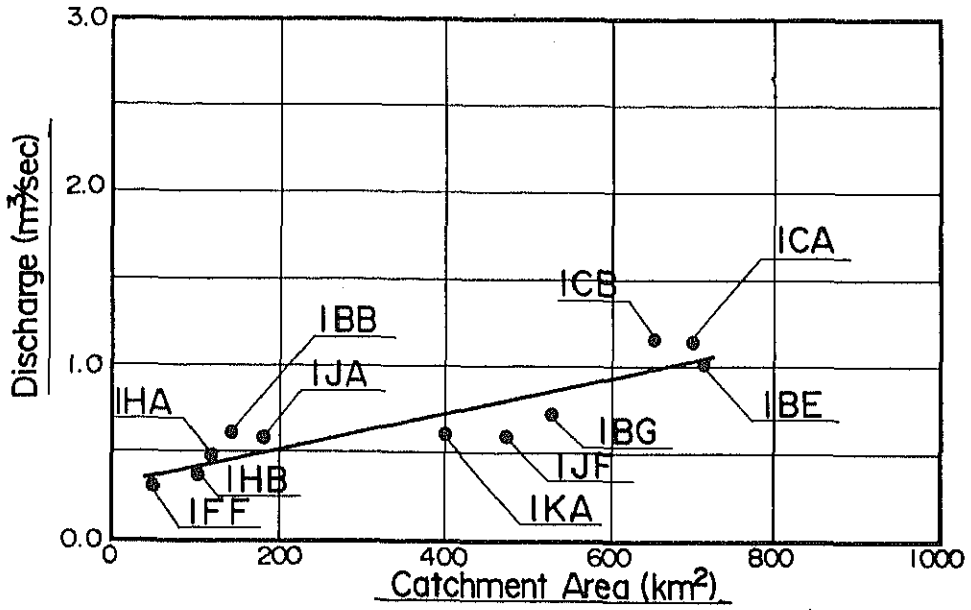


Figure B6.9 Selected Sub-drainage Area for Water Balance Calculation

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Groundwater Flow



Equation : $Q = 0.001014 \times A + 0.316$

Figure B6.10 Groundwater Flow

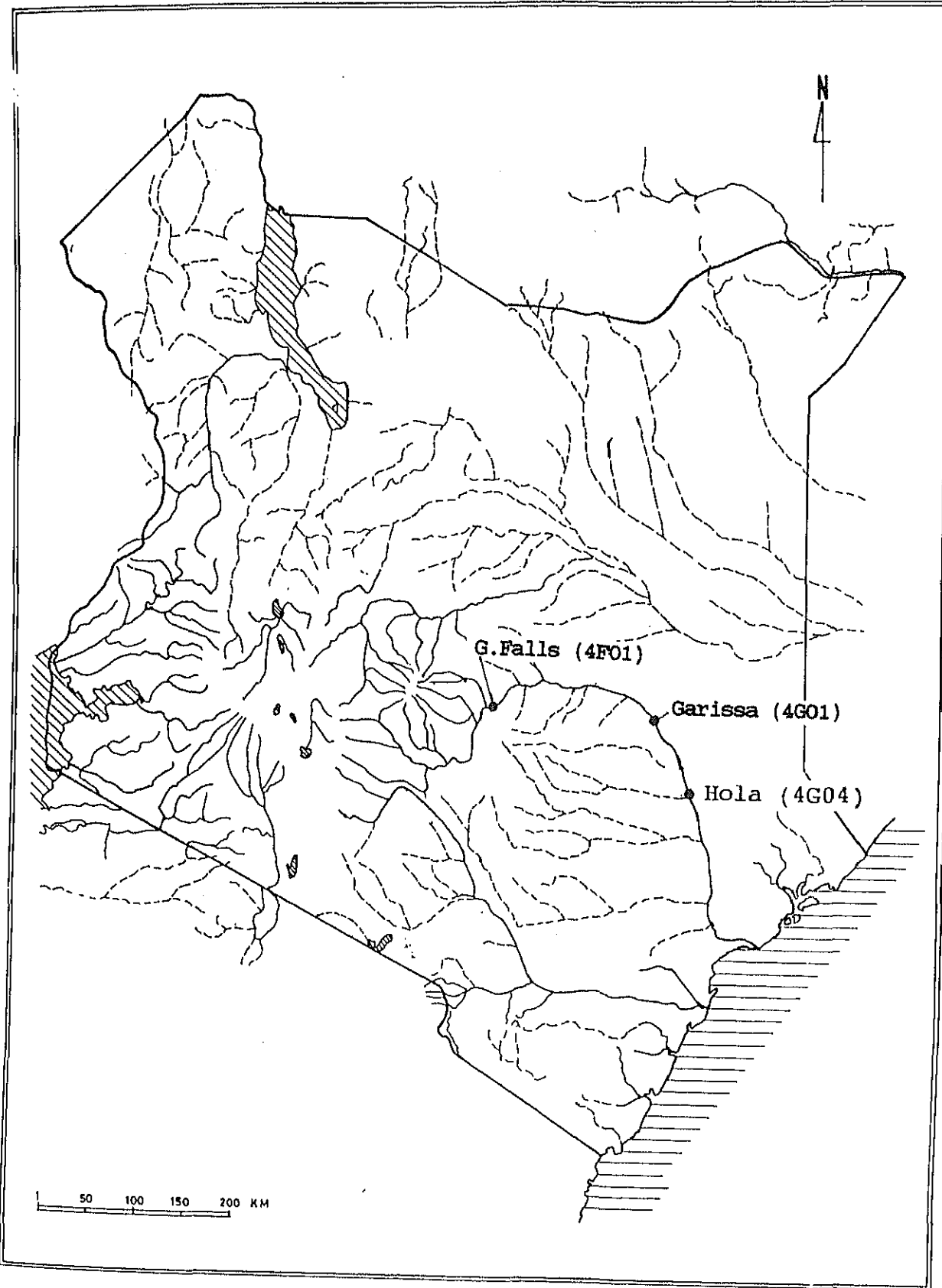


Figure B 6.11 Location of Water Level Gauges in Tana River

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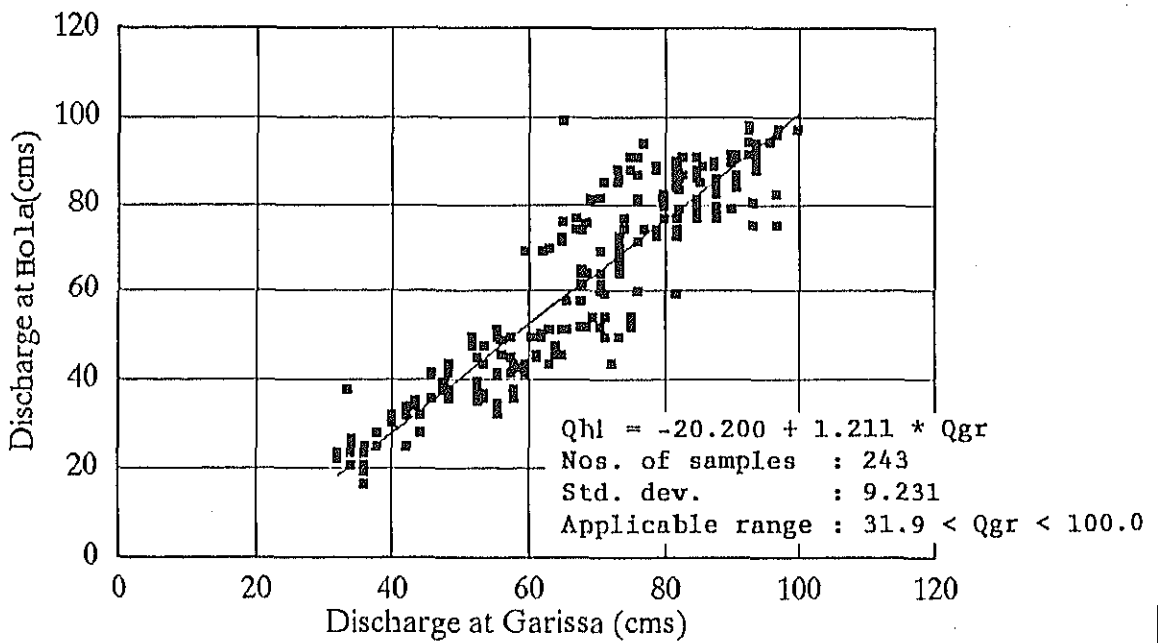
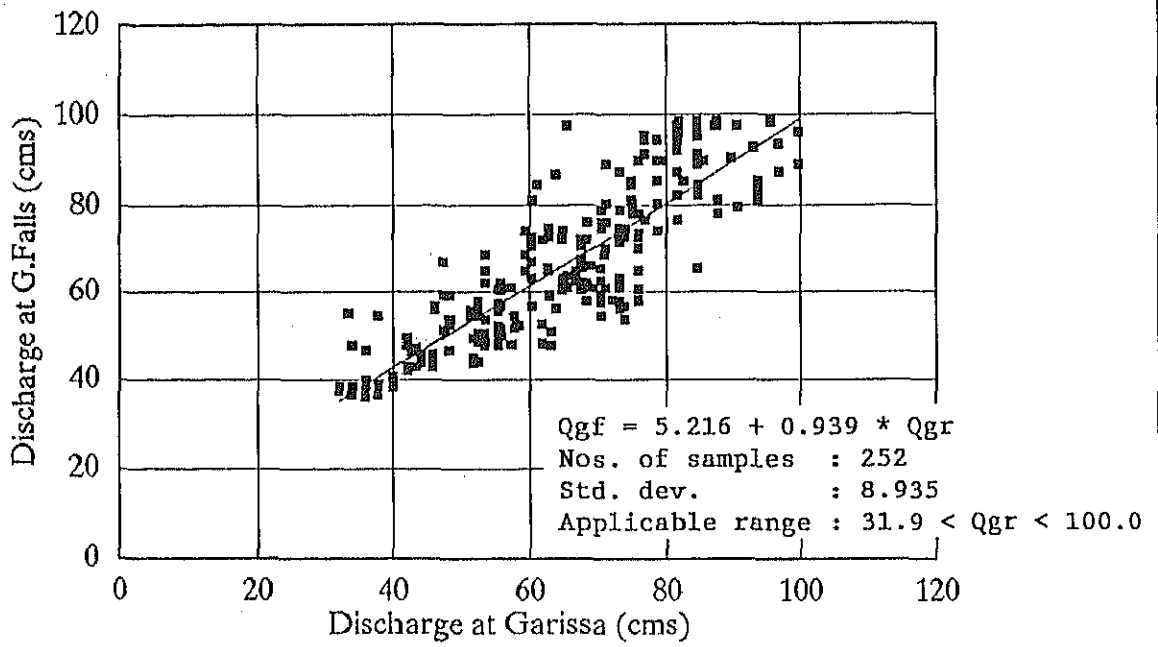


Figure B6.12 Relationship of Discharges at Tana River

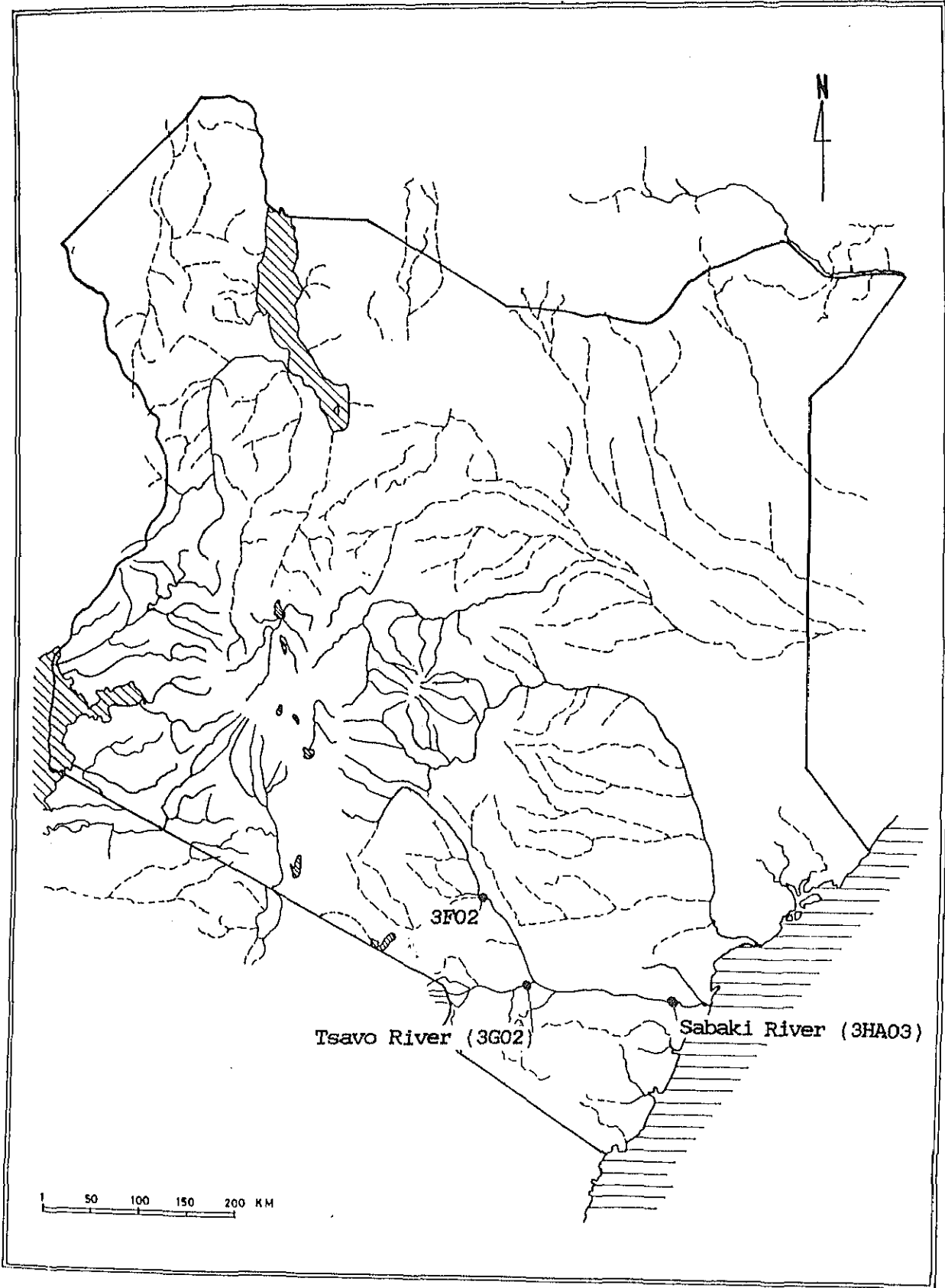


Figure B 6.13 Location of Water Level Gauges in Athi River

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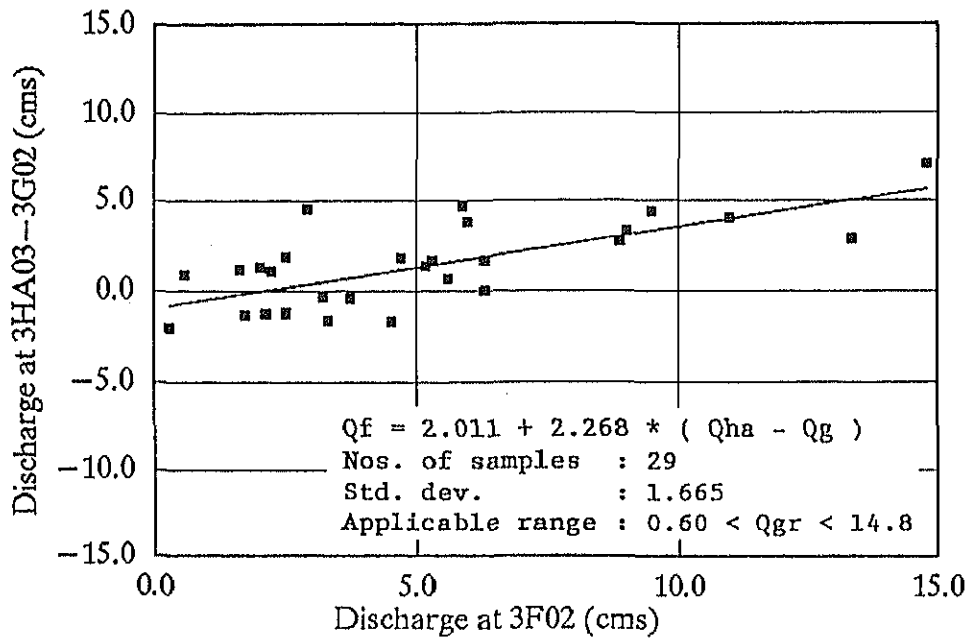
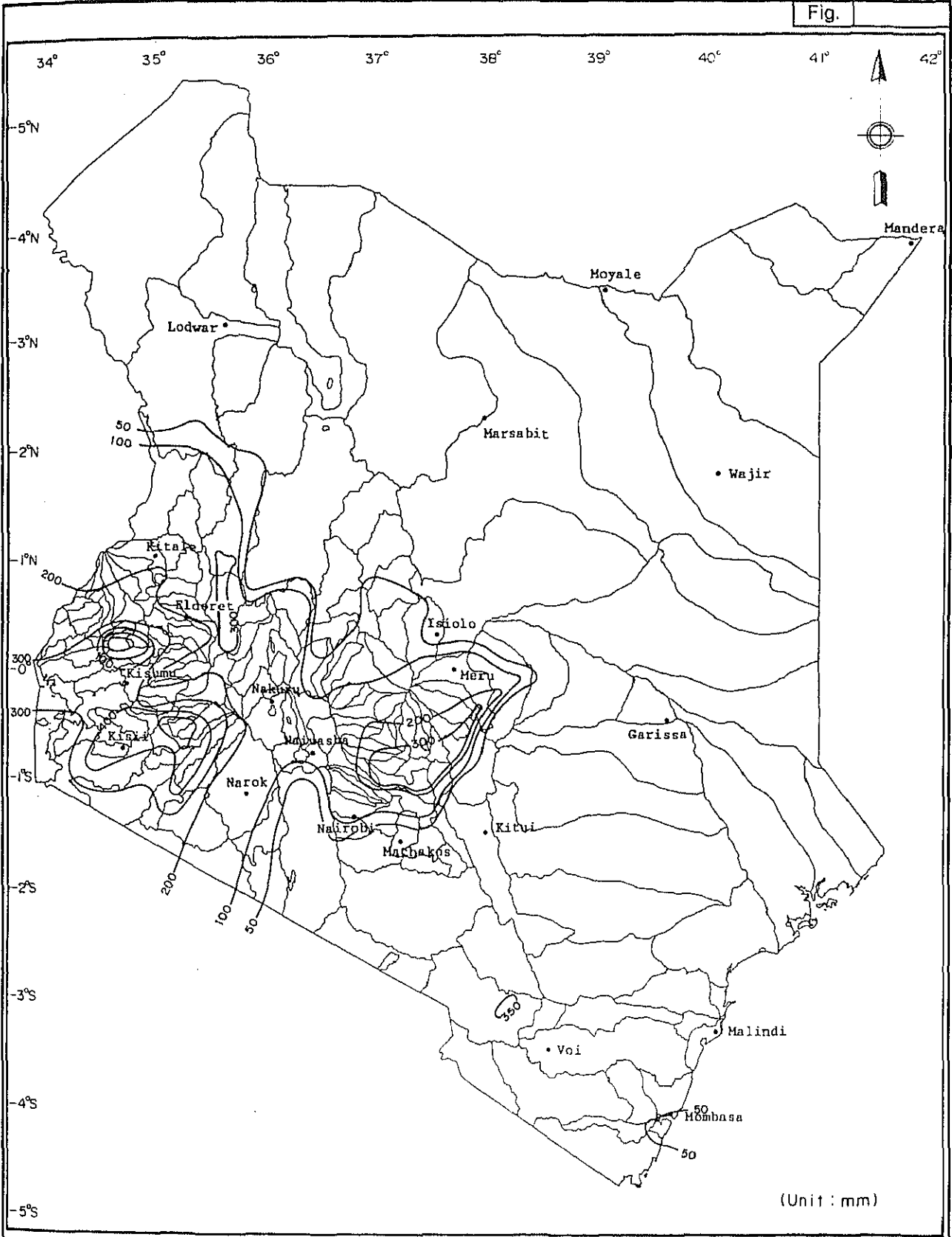


Figure B6.14 Relationship of Discharges at Athi River



(Unit : mm)

Figure B6.15 Annual Mean Runoff Depth

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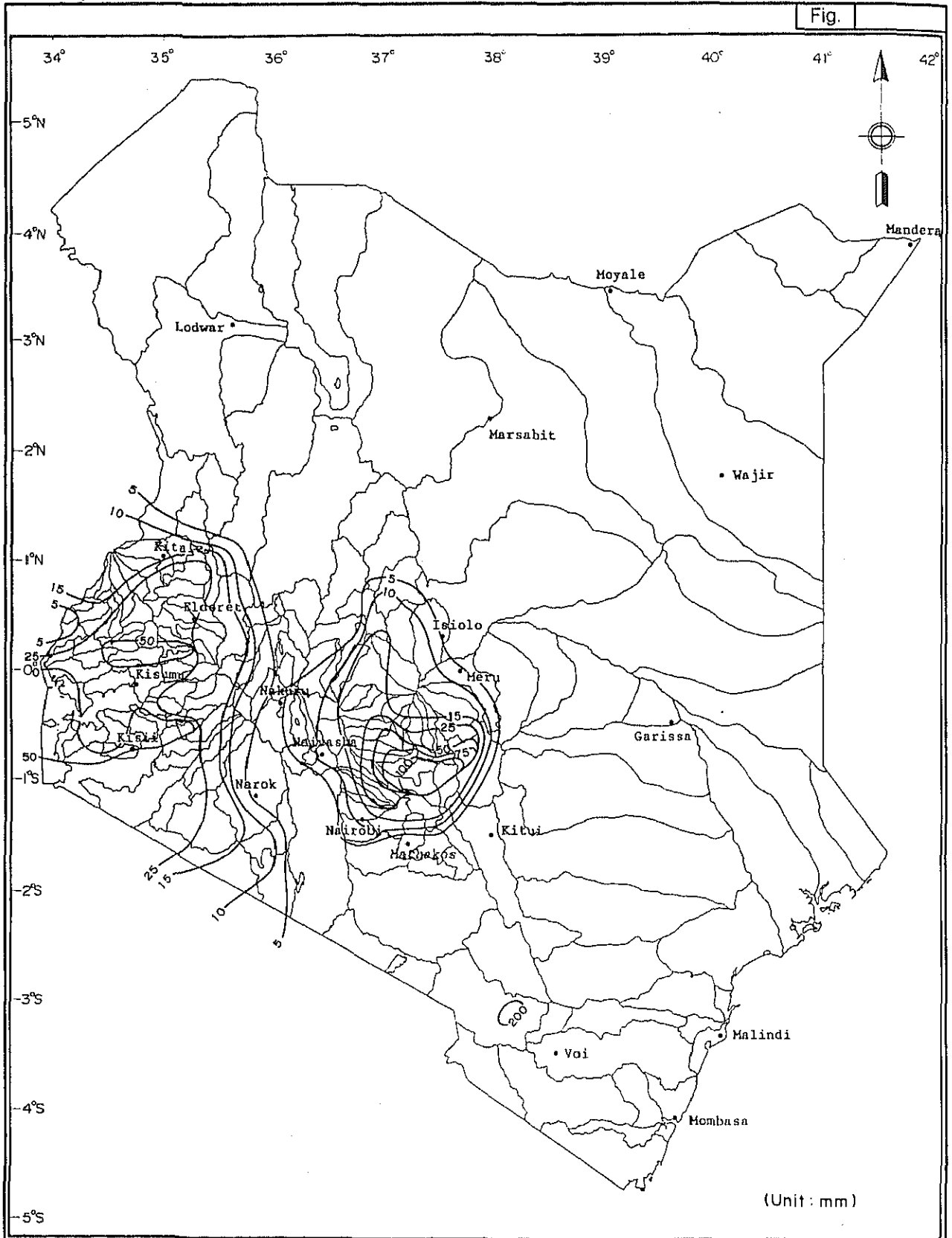


Figure B6.16 Minimum Monthly Runoff Depth

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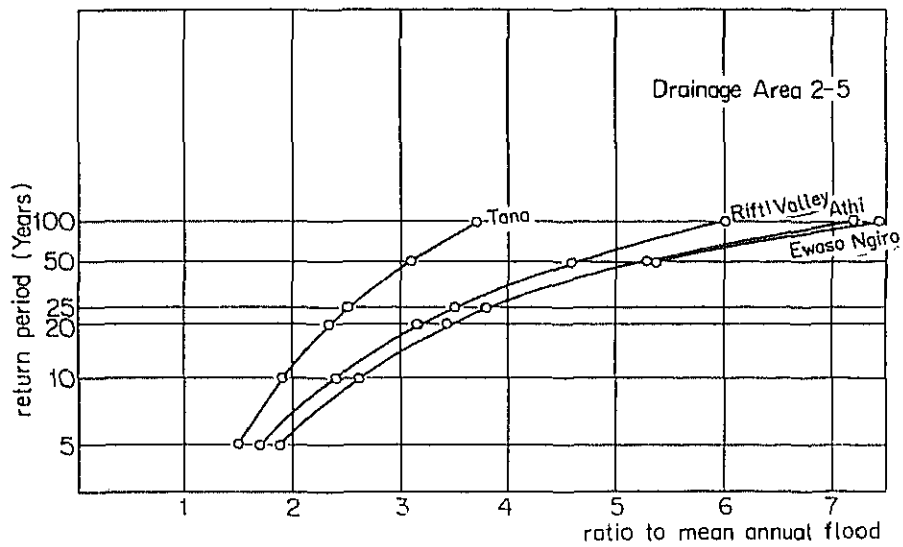
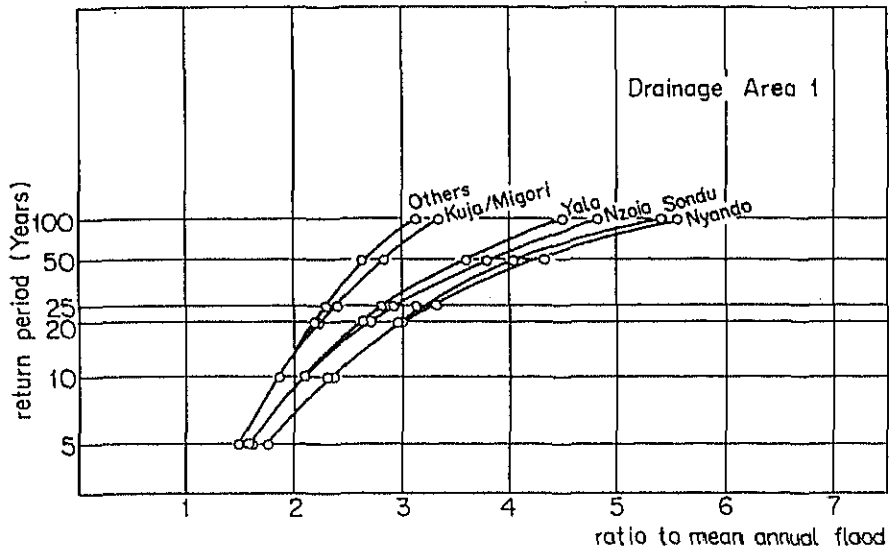


Figure B7.1 Ratio of Various Probable Floods to Mean Annual Flood

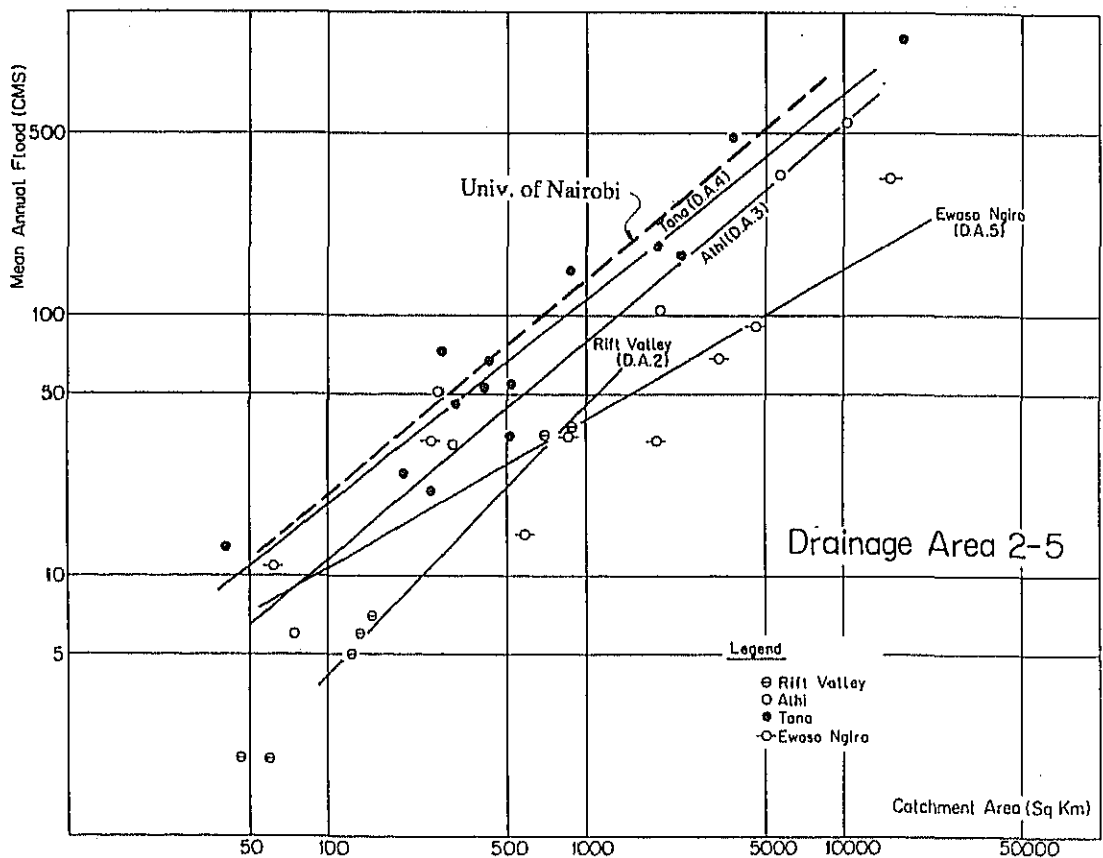
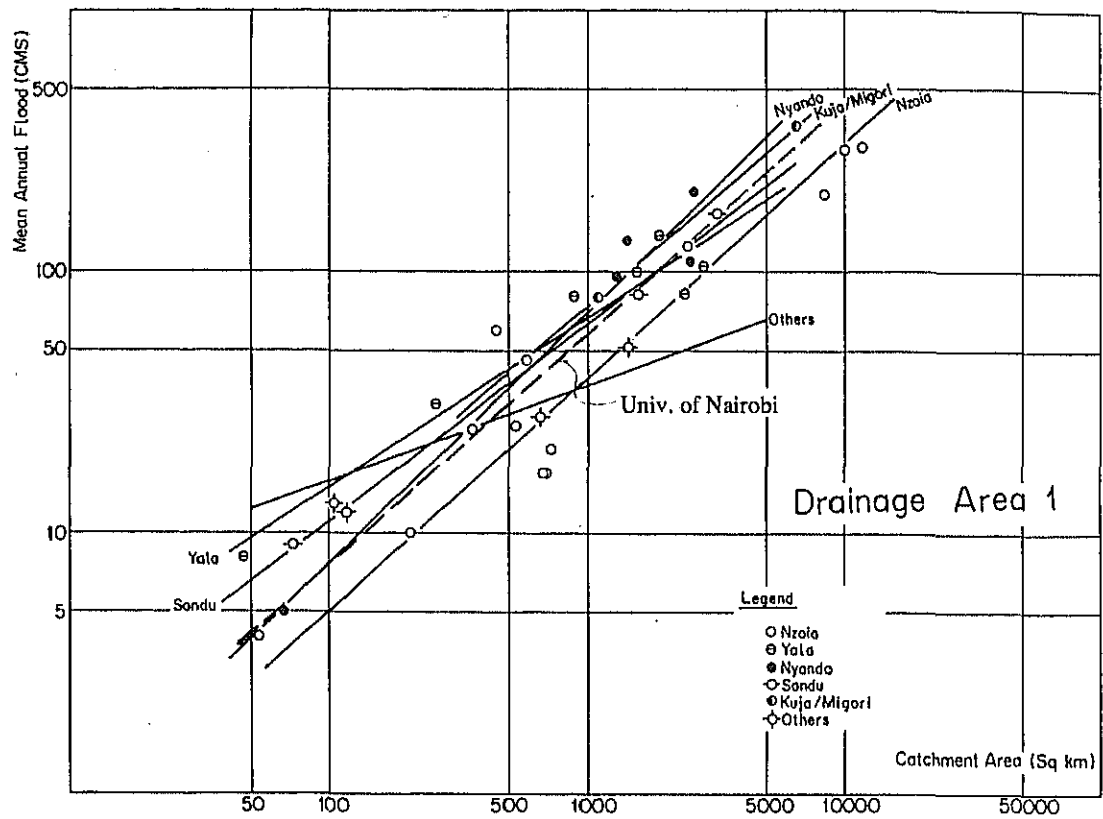


Figure B7.2 Mean Annual Flood Discharges

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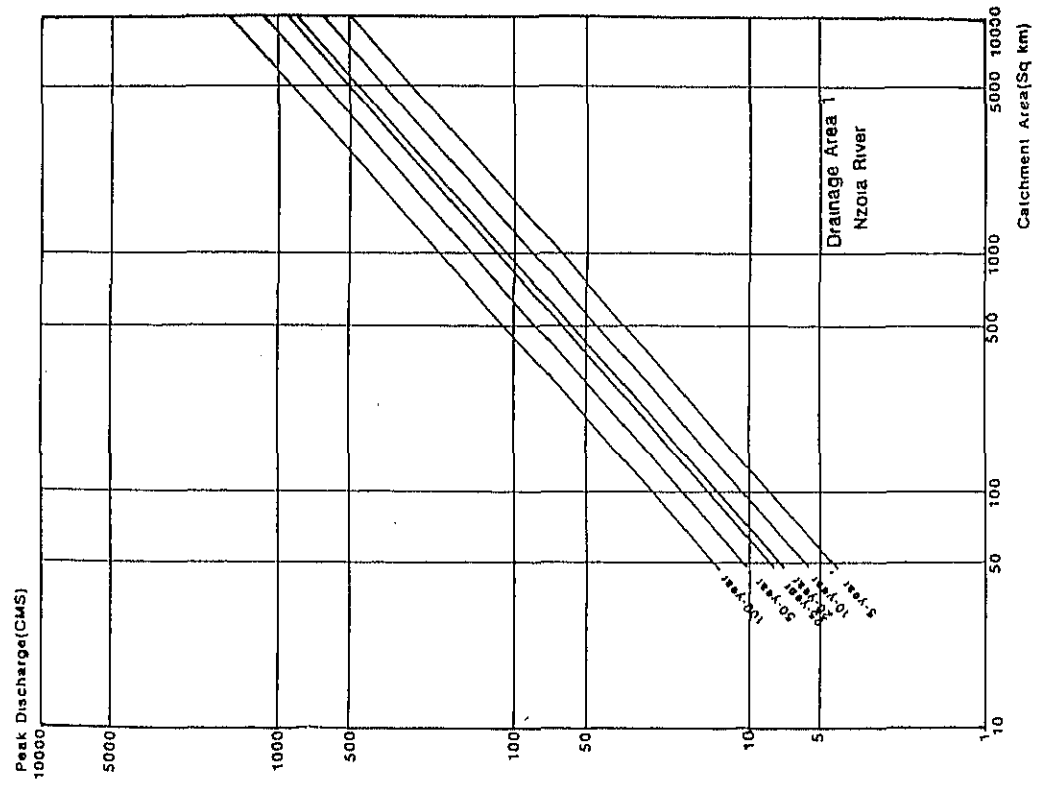
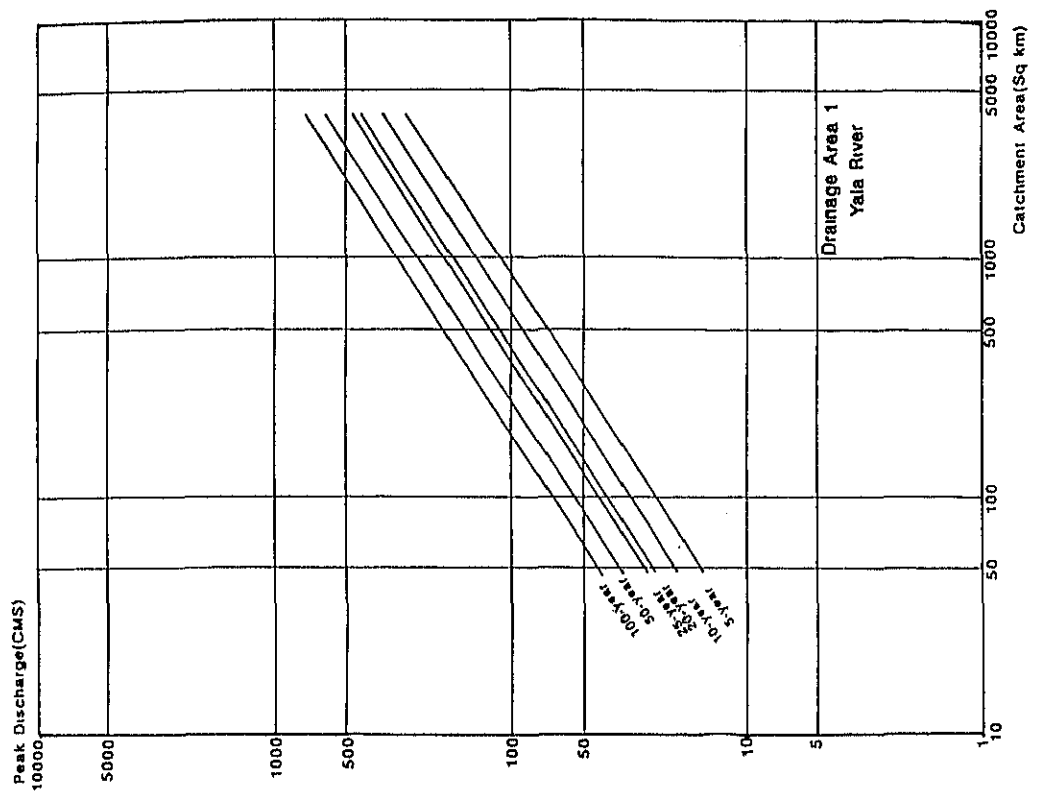


Figure B7.3 Regional Flood Curves for Major Rivers (1/5)

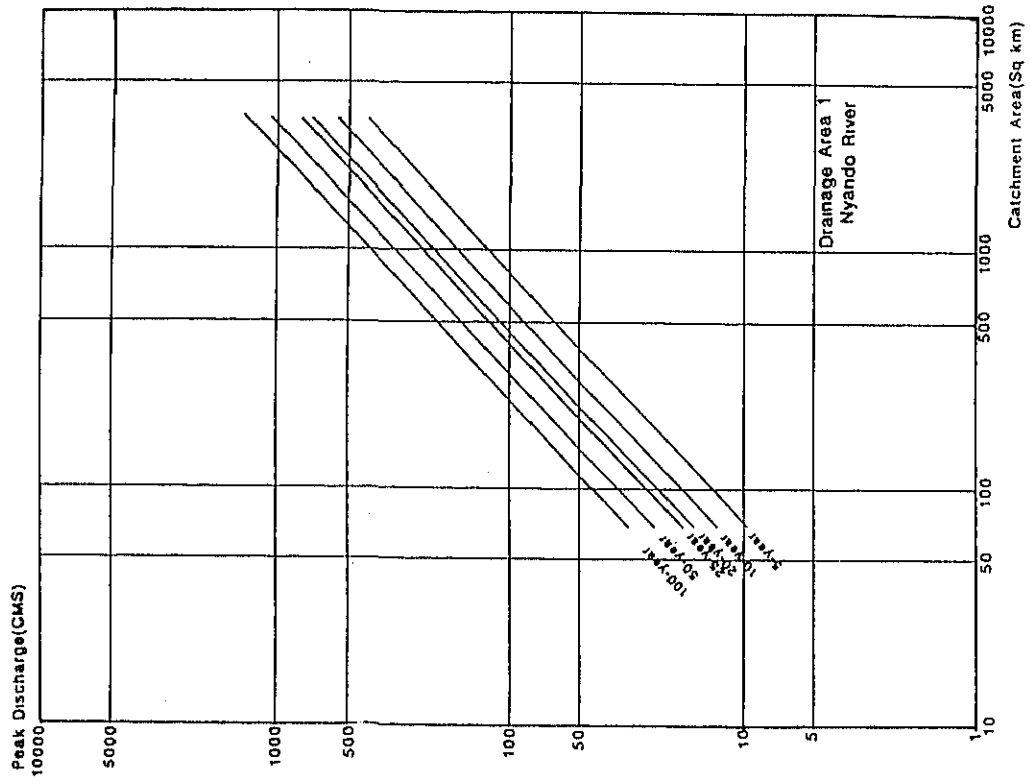
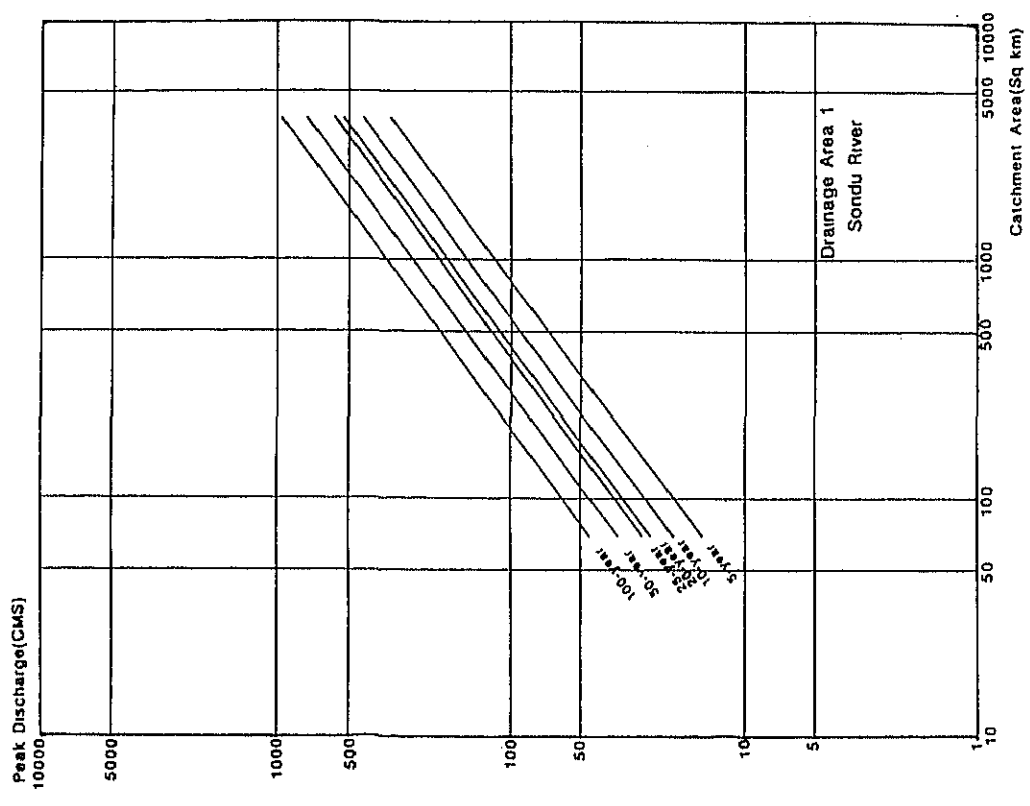


Figure B7.3 Regional Flood Curves for Major Rivers (2/5)

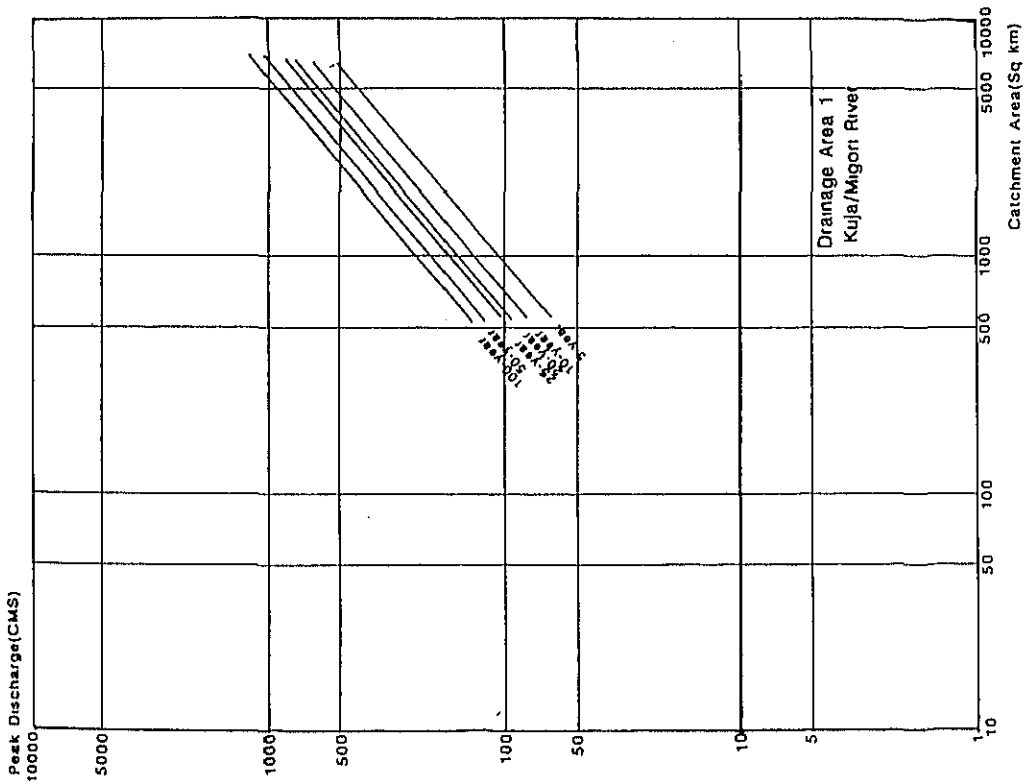
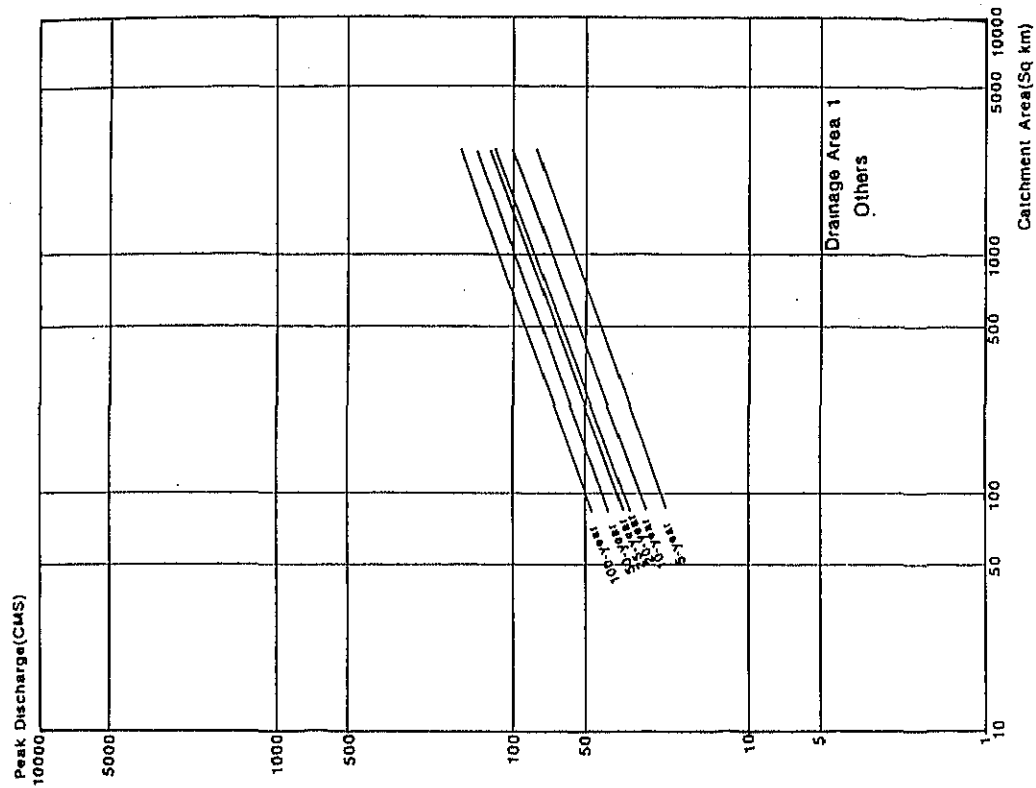


Figure B7.3 Regional Flood Curves for Major Rivers (3/5)

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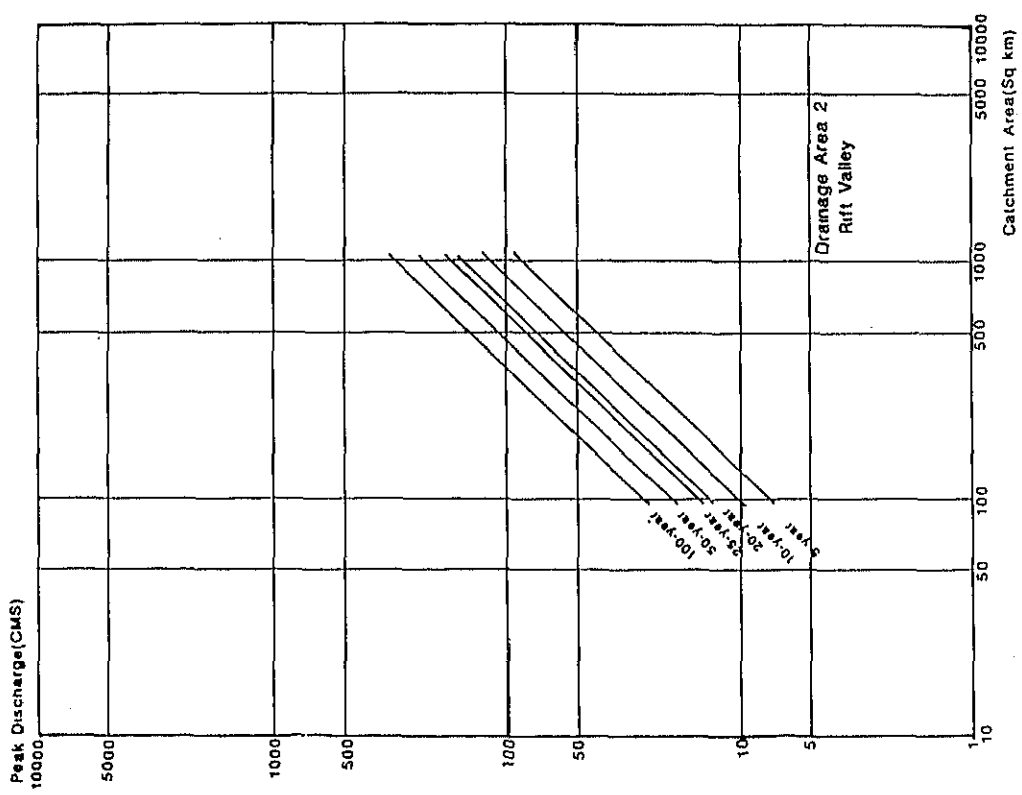
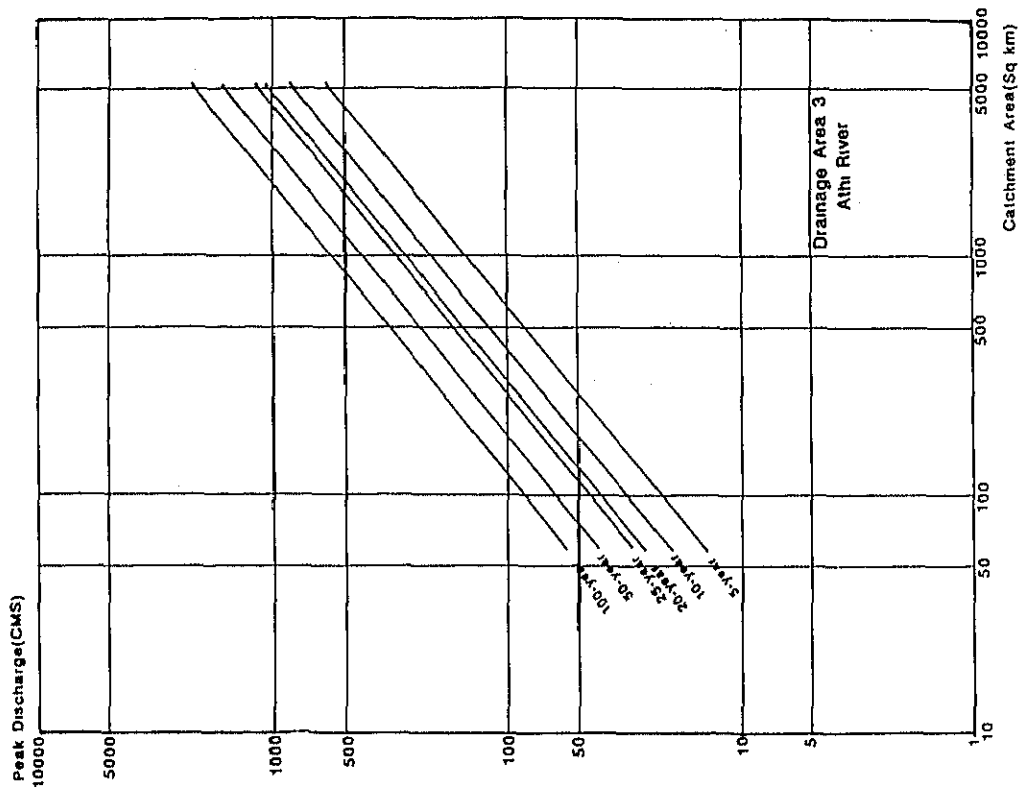


Figure B7.3 Regional Flood Curves for Major Rivers (4/5)

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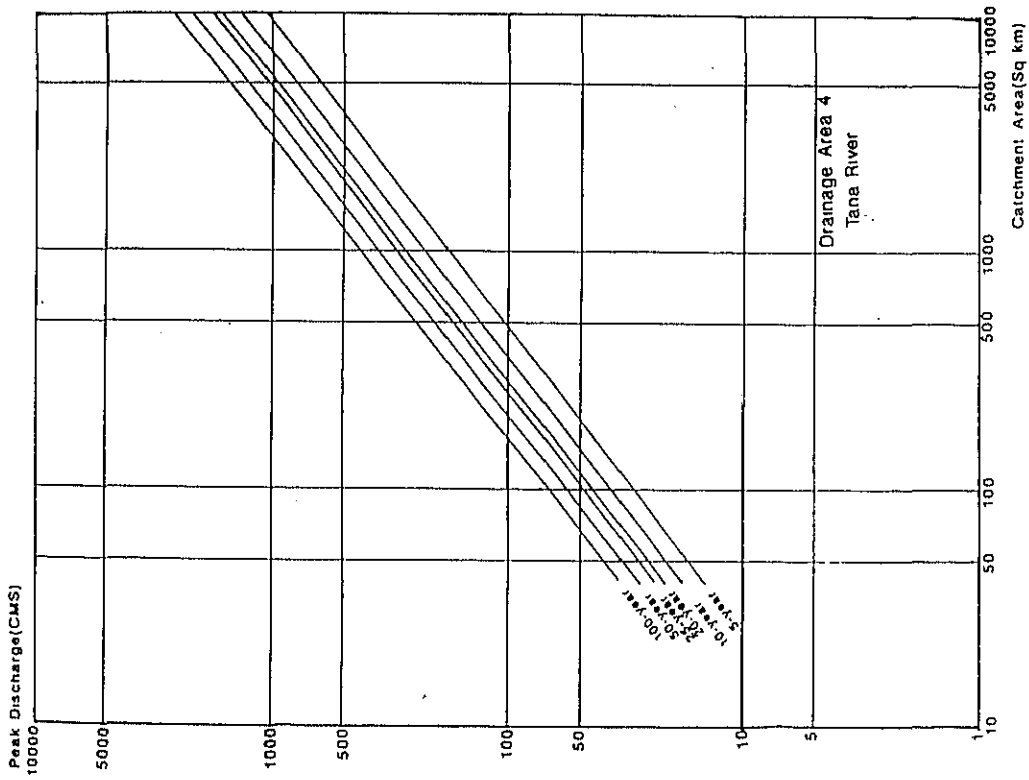
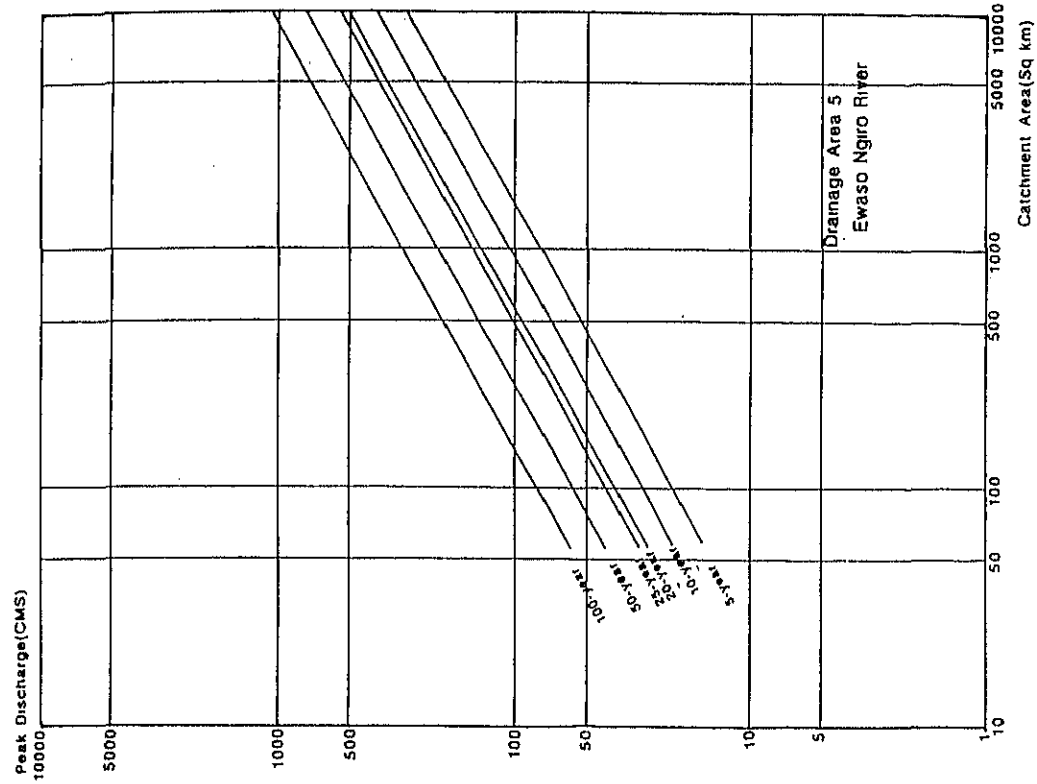


Figure B7.3 Regional Flood Curves for Major Rivers (5/5)

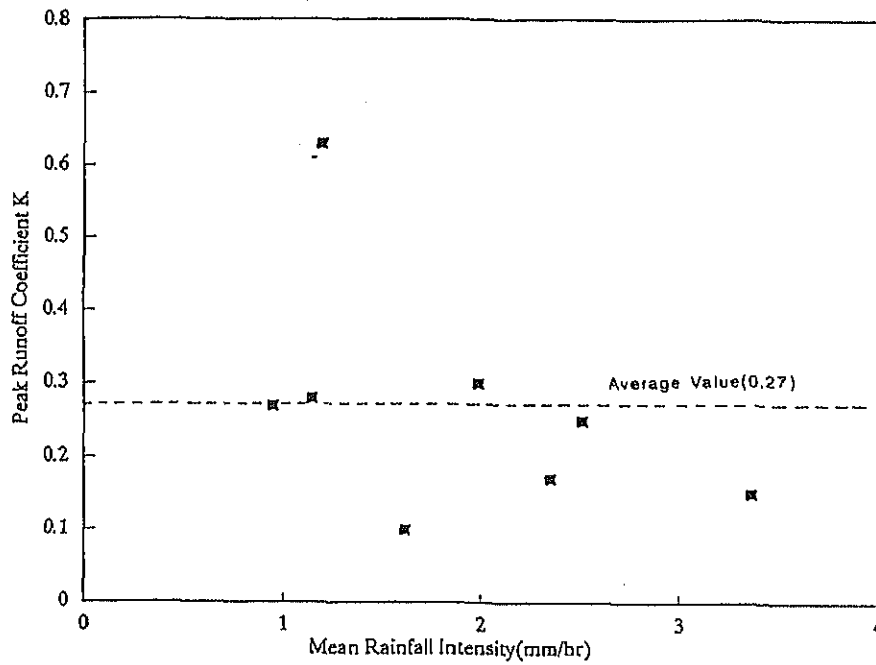


Figure B7.4 Peak Runoff Coefficient for Mean Rainfall Intensity

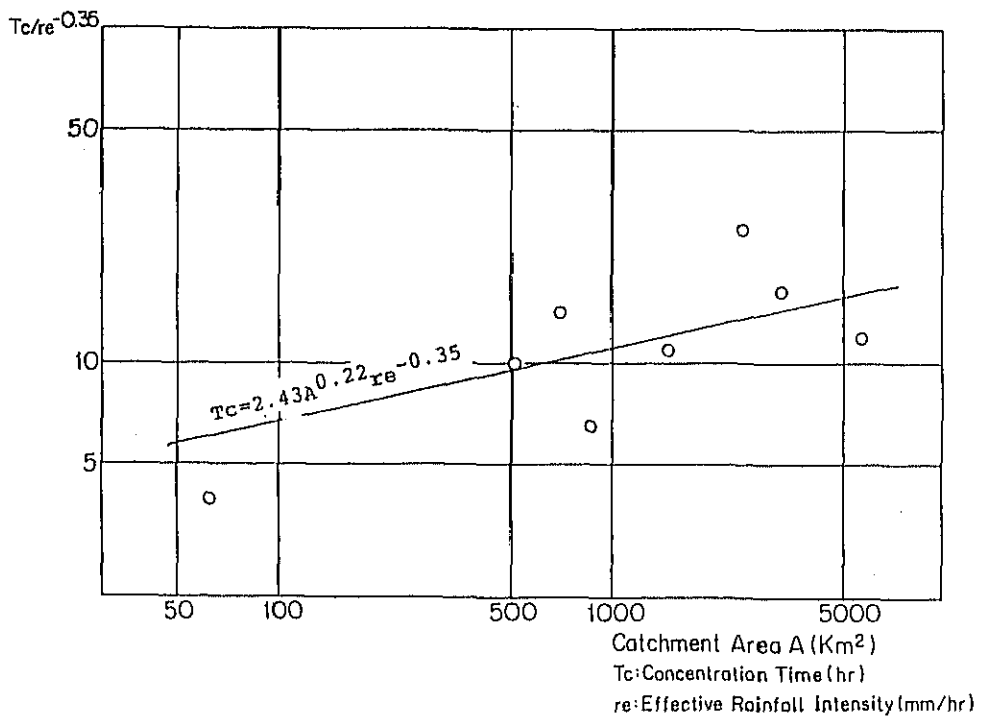


Figure B7.5 Concentration Time for Catchment Area and Effective Rainfall Intensity

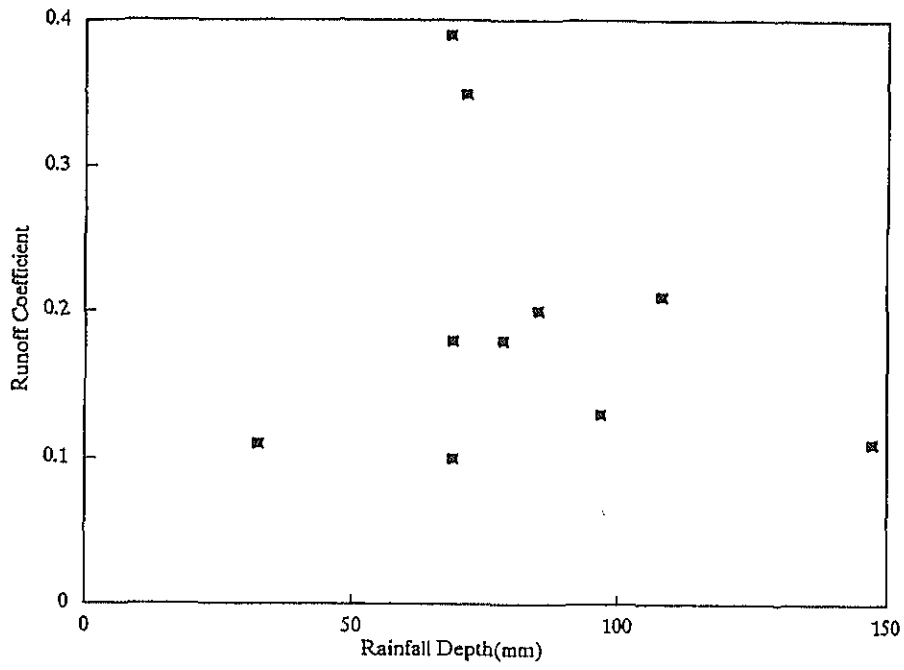


Figure B7.6 Runoff Coefficient for Rainfall Depth

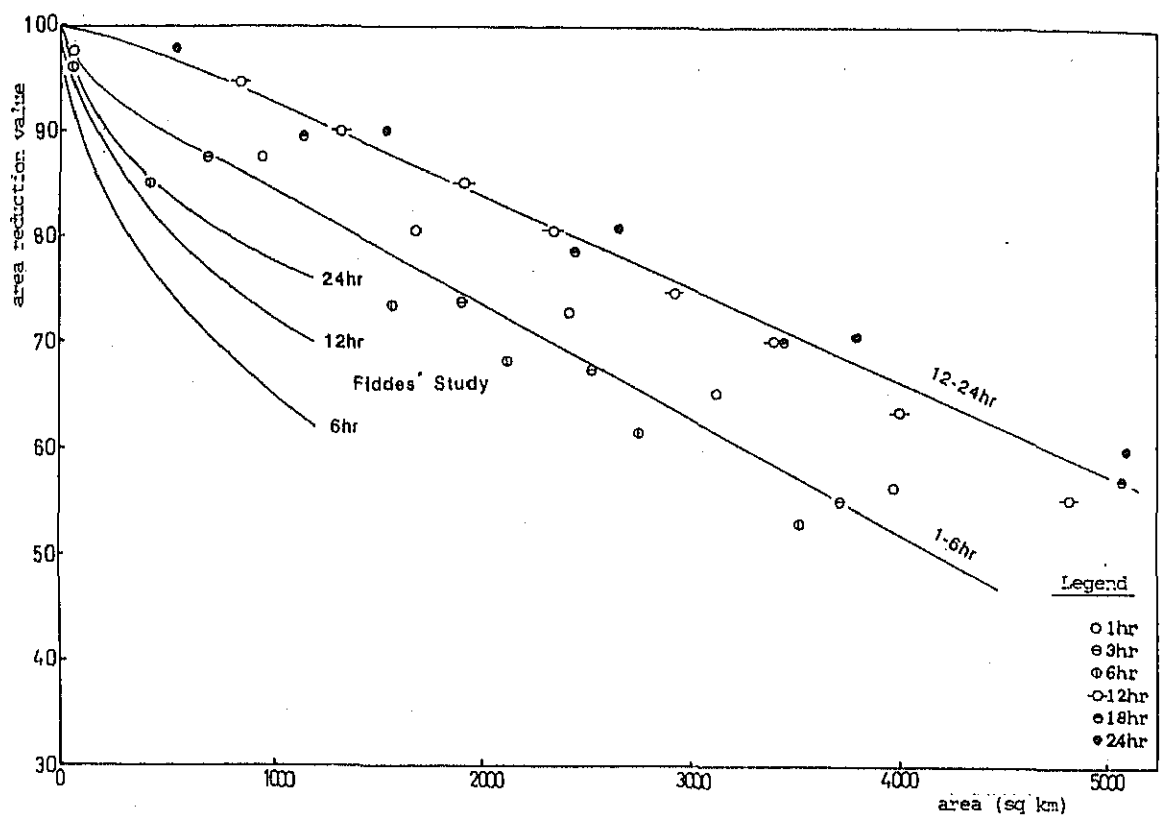


Figure B7.7 Area Reduction Curve

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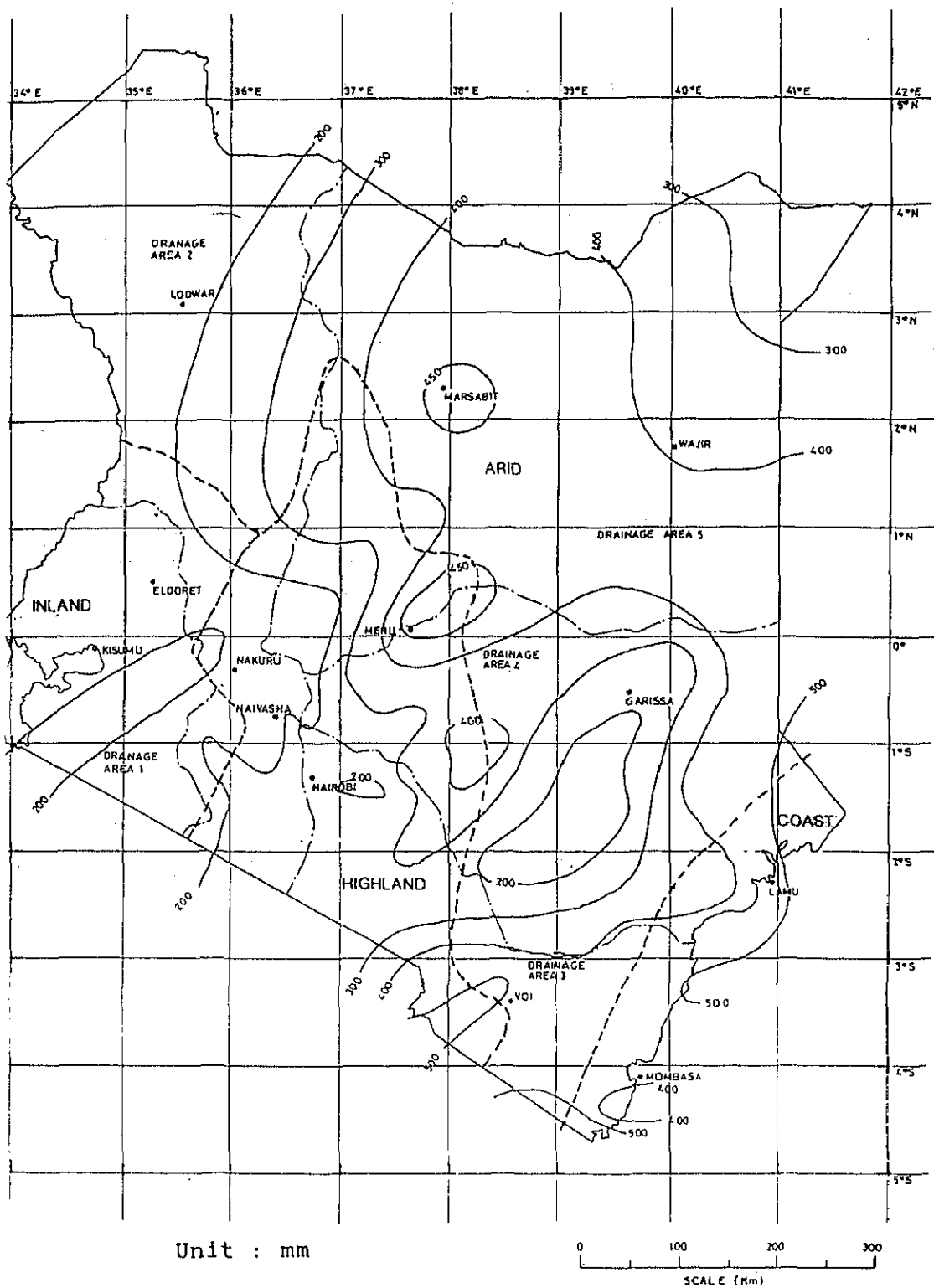


Figure B7.8 Isohyetal Map of Probable Maximum Precipitation

Source: Isohyetal Map: Obasi and Nimira (1977)

Geographic Zone (-----): TRRL Laboratory Report 623 (1974)

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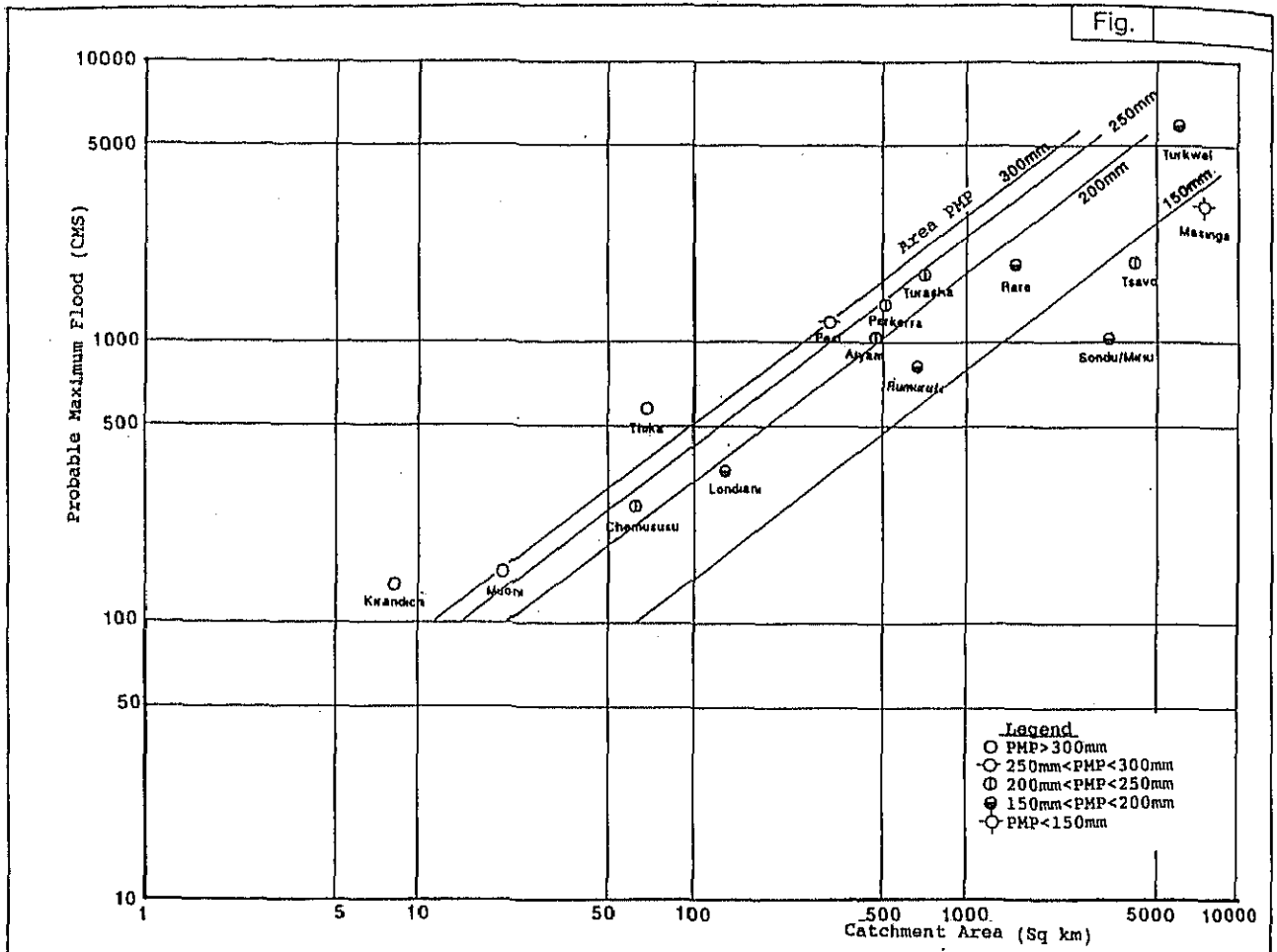


Figure B7.9 Relationship between PMF, PMP and Catchment Area

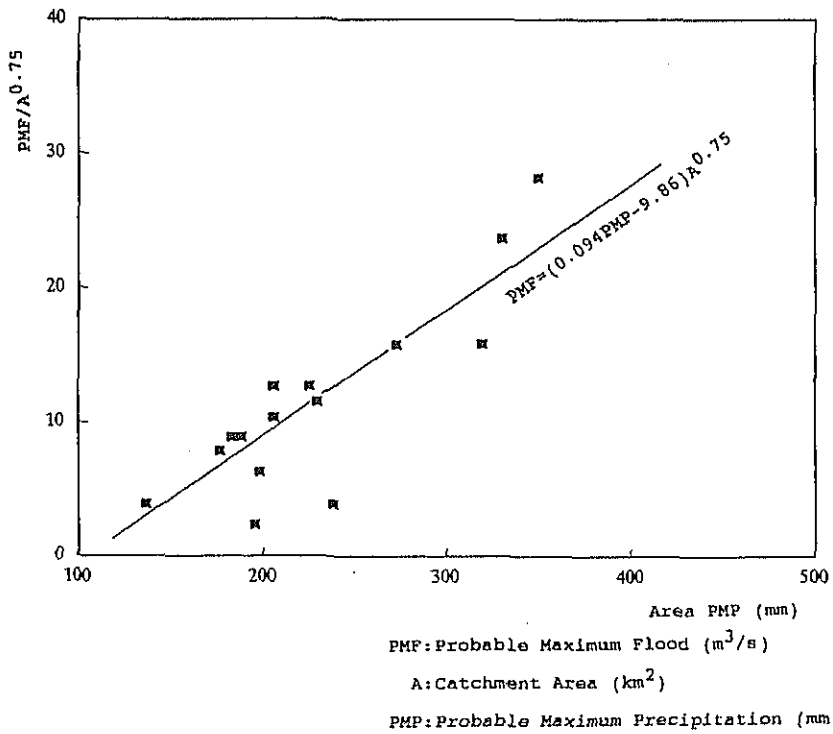


Figure B7.10 Regression Curve for the relationship between PMF, PMP and Catchment Area

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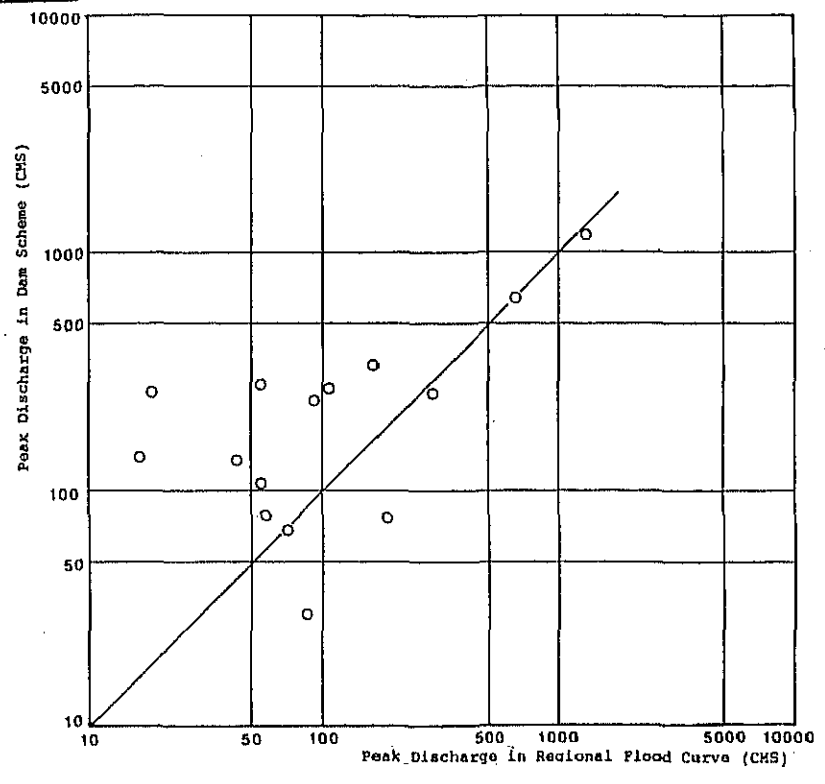


Figure B7.11 Comparison of Regional Flood Peak Discharge and 10-year Probable Flood at Damsite

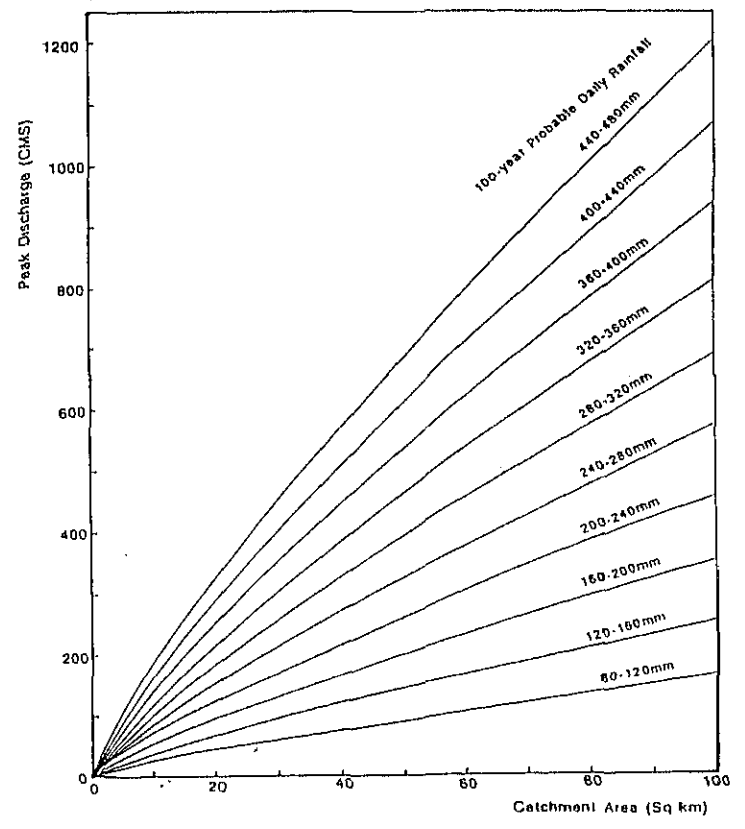


Figure B7.12 Peak Discharges with 100-year Probability for Small Catchment

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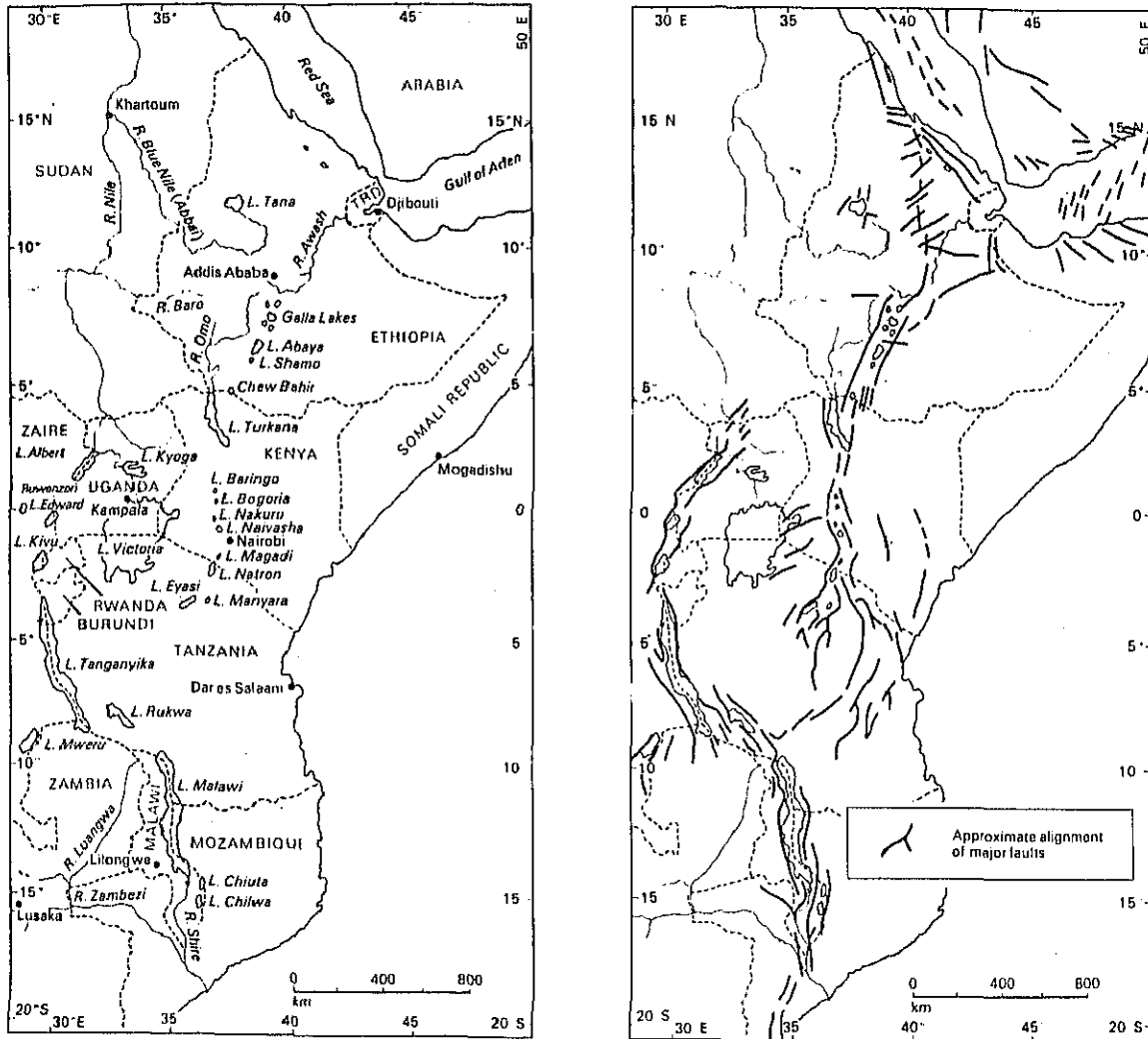
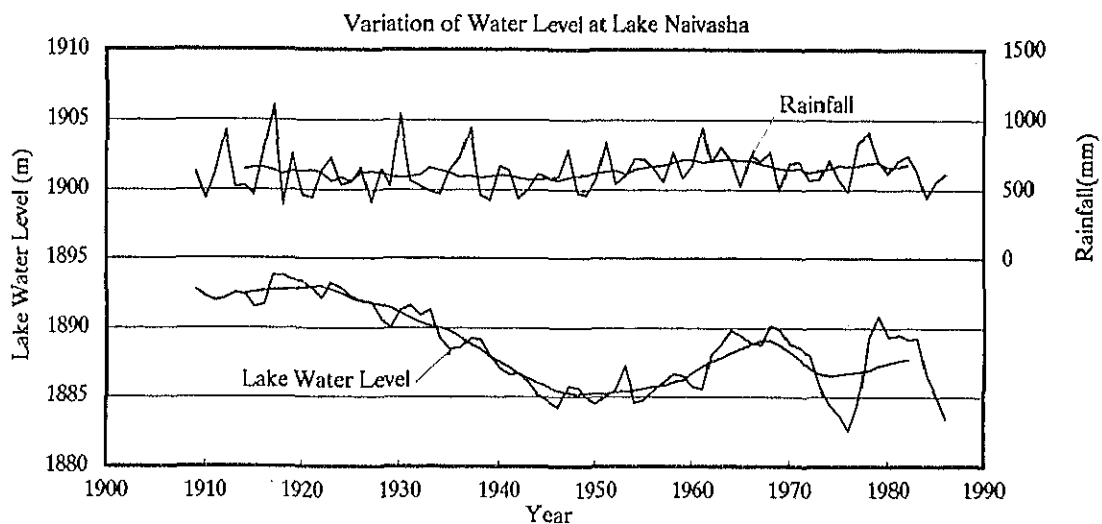
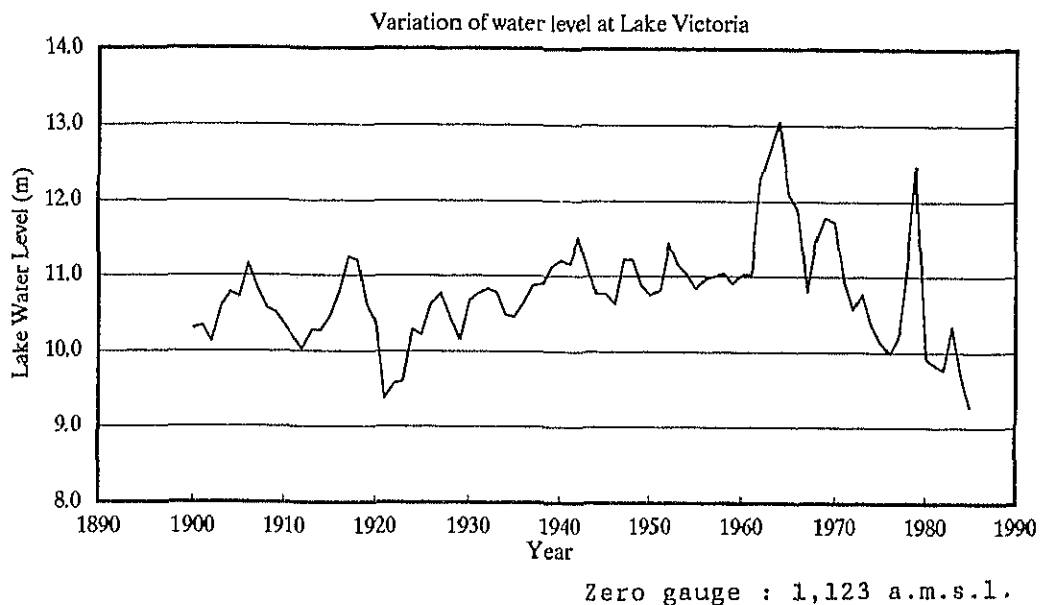


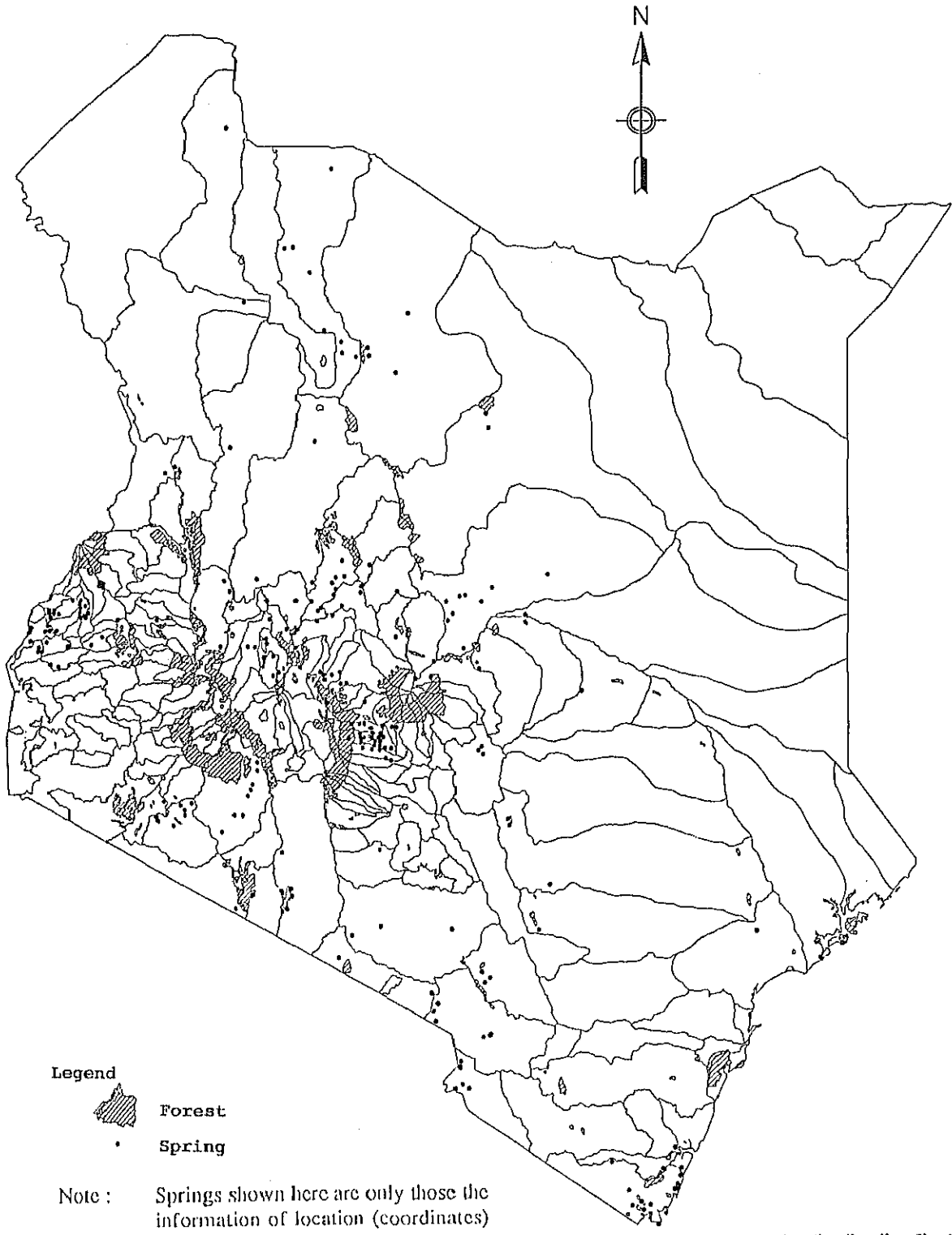
Figure B8.1 Lakes in Eastern Africa

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Note : Water level indicates in a.m.s.l.

Figure B8.2 Variation of Water Level at Lake Victoria and Lake Naivasha



Legend

-  Forest
-  Spring

Note : Springs shown here are only those the information of location (coordinates) is available.

Figure B9.1 Location Map of Springs

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APPENDIXES

APPENDIX B.1

Variation of Annual Rainfall Depth

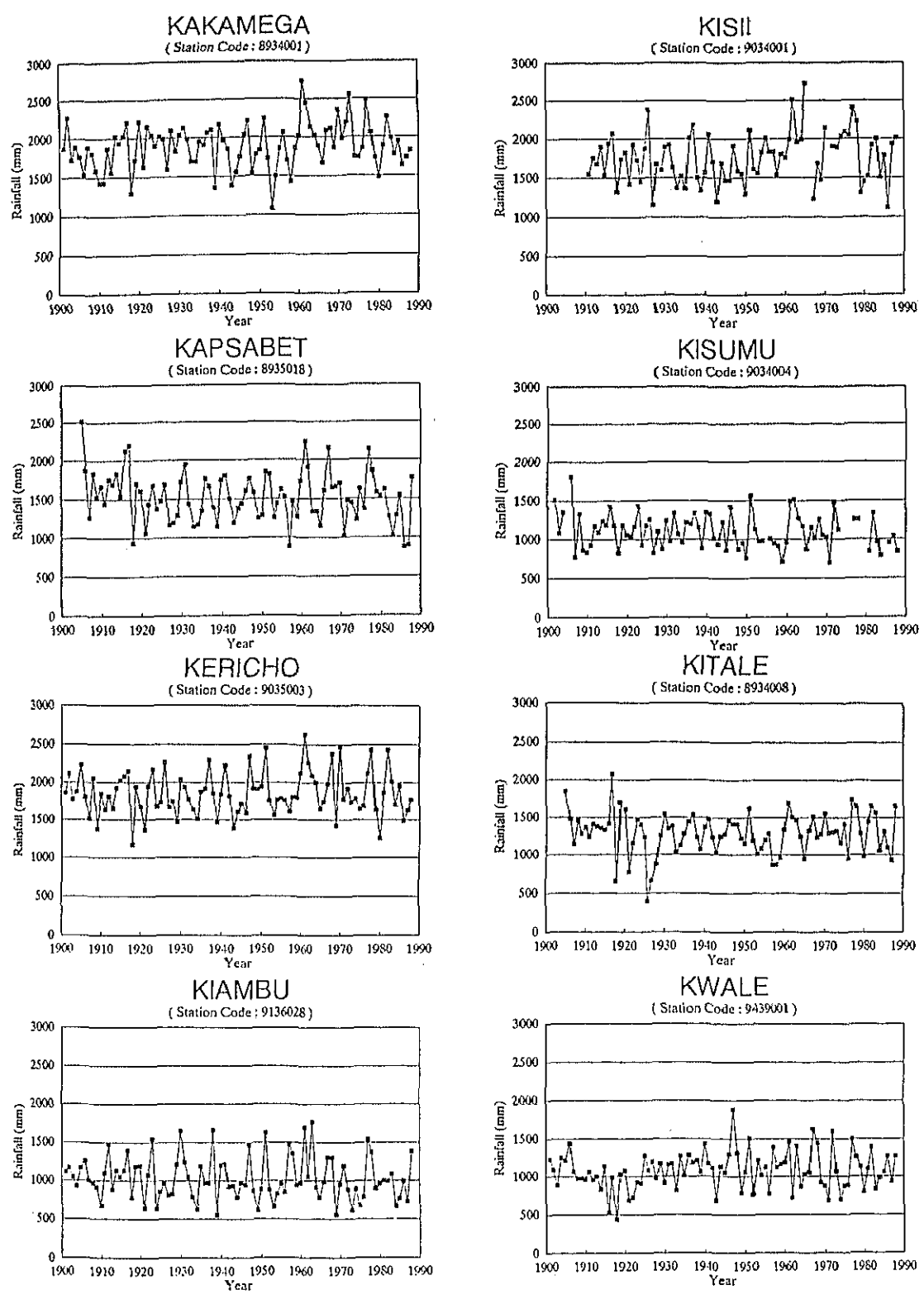


Figure B.1.1 Variation of Annual Rainfall Depth (1/3)

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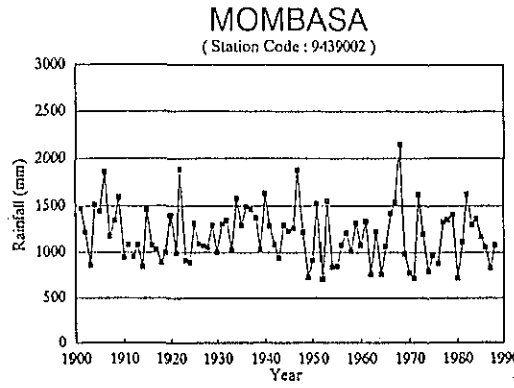
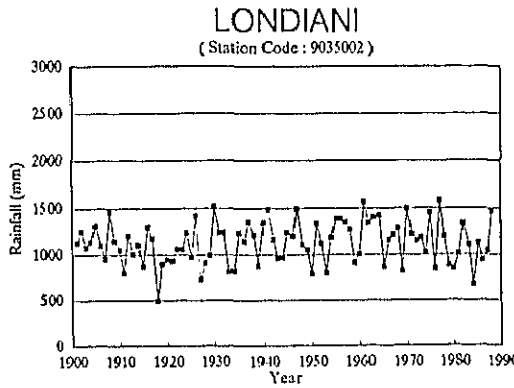
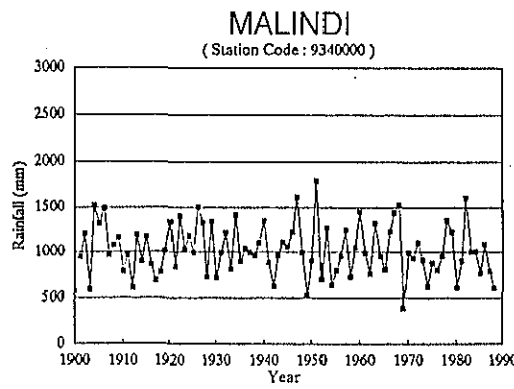
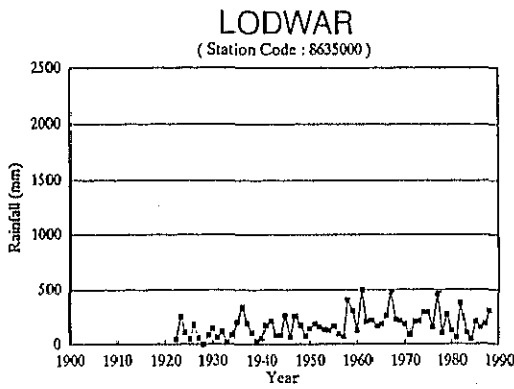
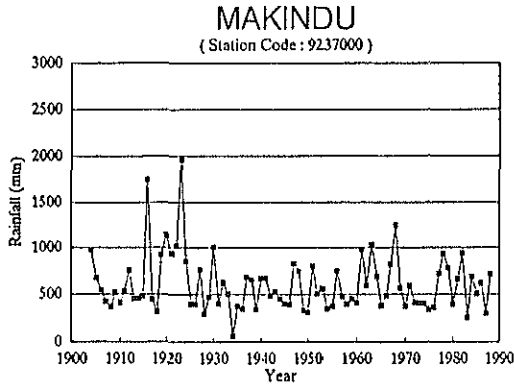
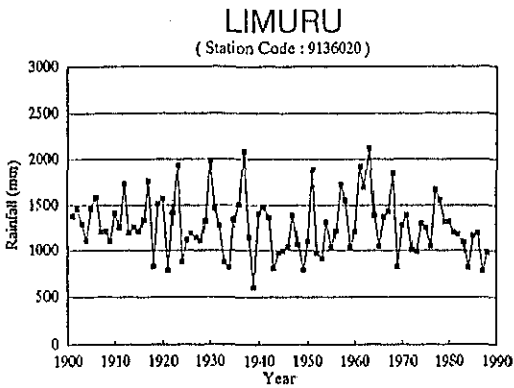
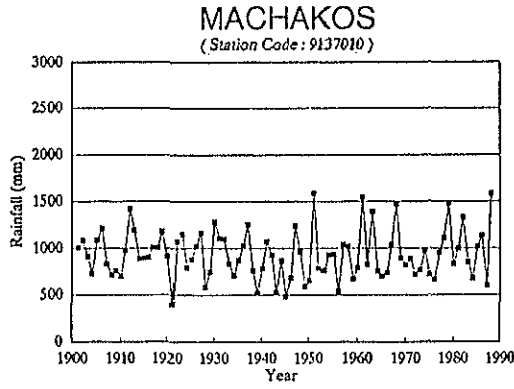
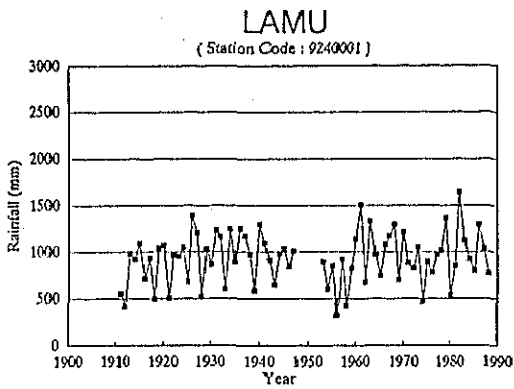


Figure B.1.1 Variation of Annual Rainfall Depth (2/3)

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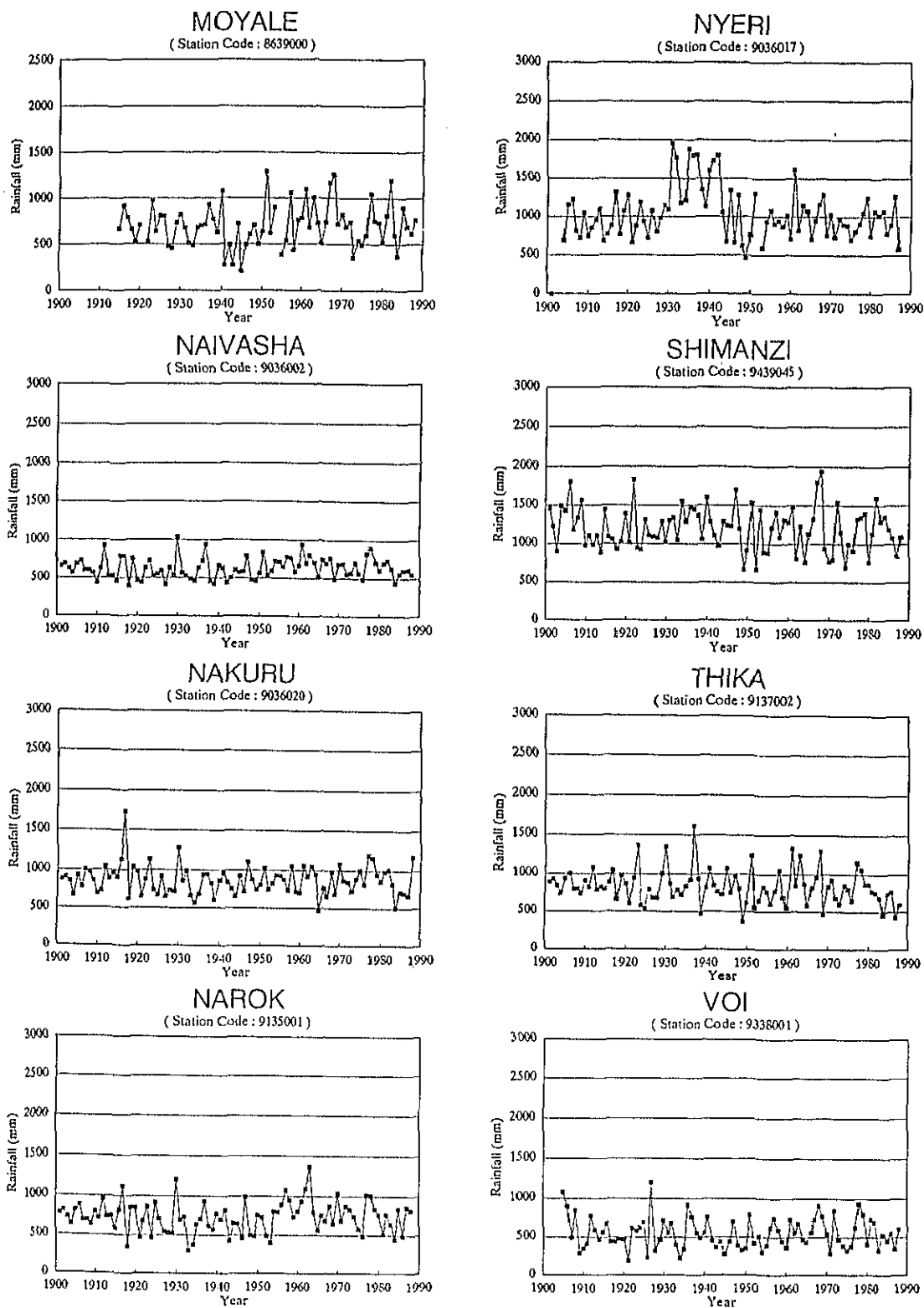


Figure B.1.1 Variation of Annual Rainfall Depth (3/3)

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APPENDIX B.2

Isohyetal Map of Monthly Rainfall Depth

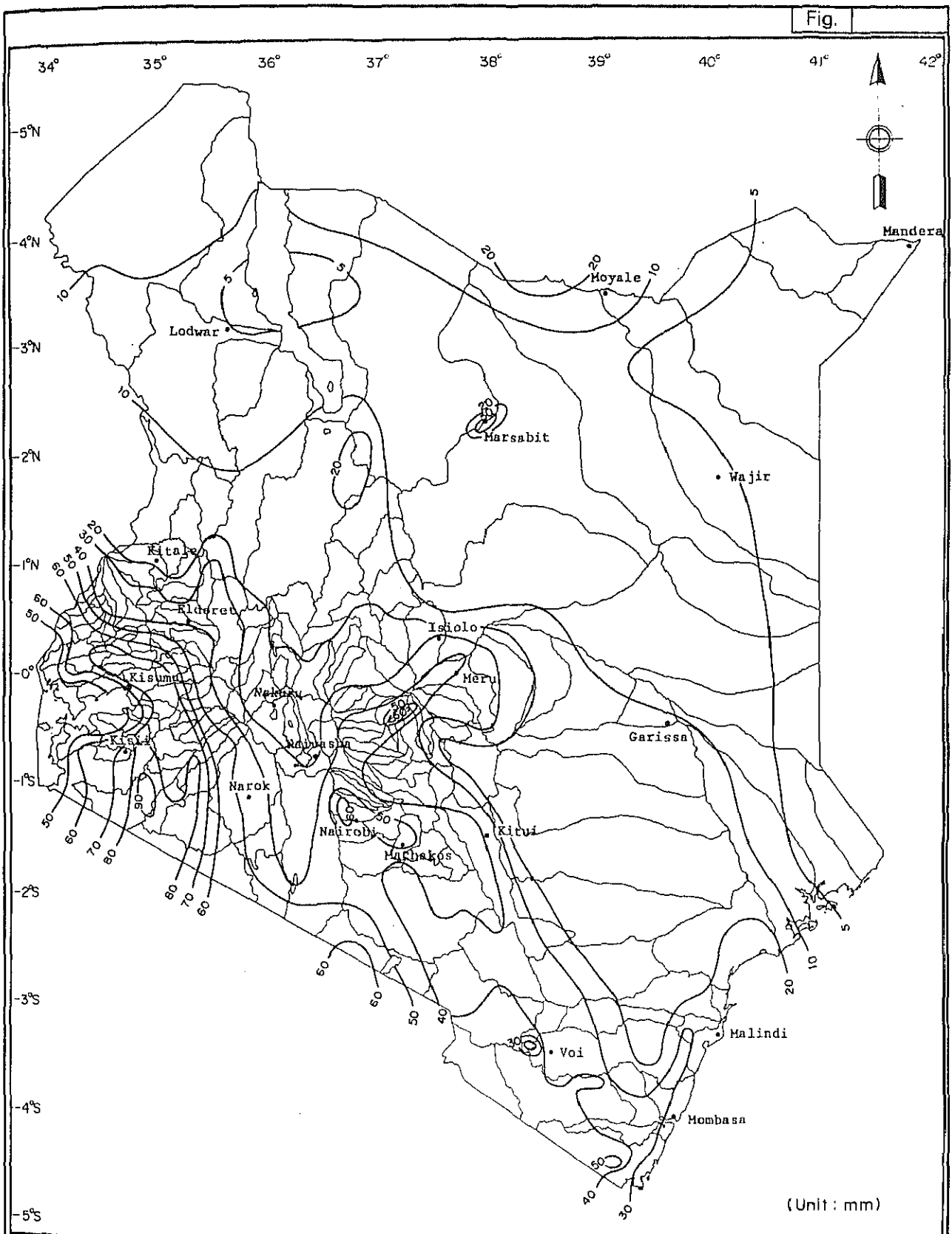


Figure B.2.1 Isohyetal Map of Monthly Mean Rainfall (January)

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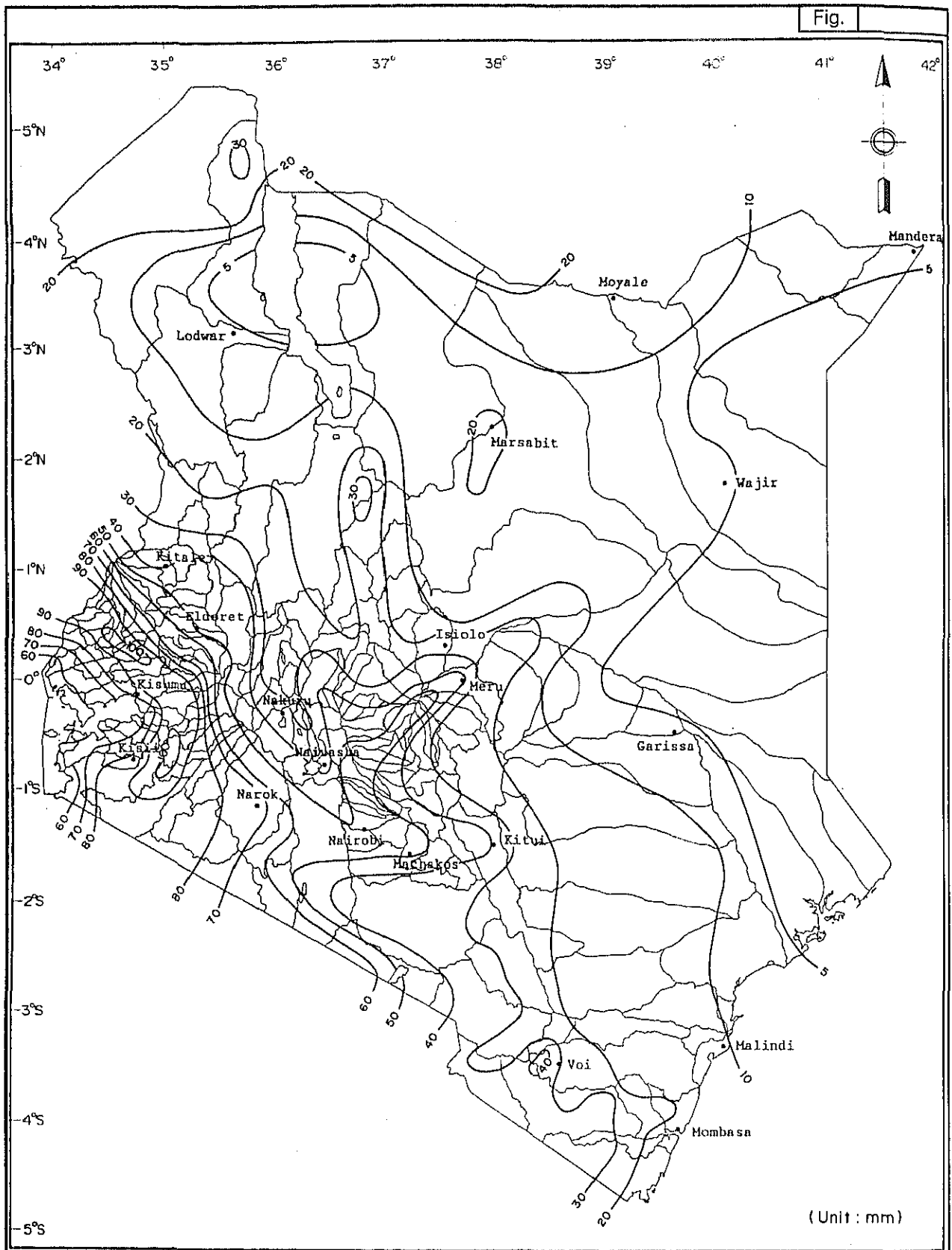


Figure B.2.2 Isohyetal Map of Monthly Mean Rainfall (February)

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JAPAN INTERNATIONAL COOPERATION AGENCY

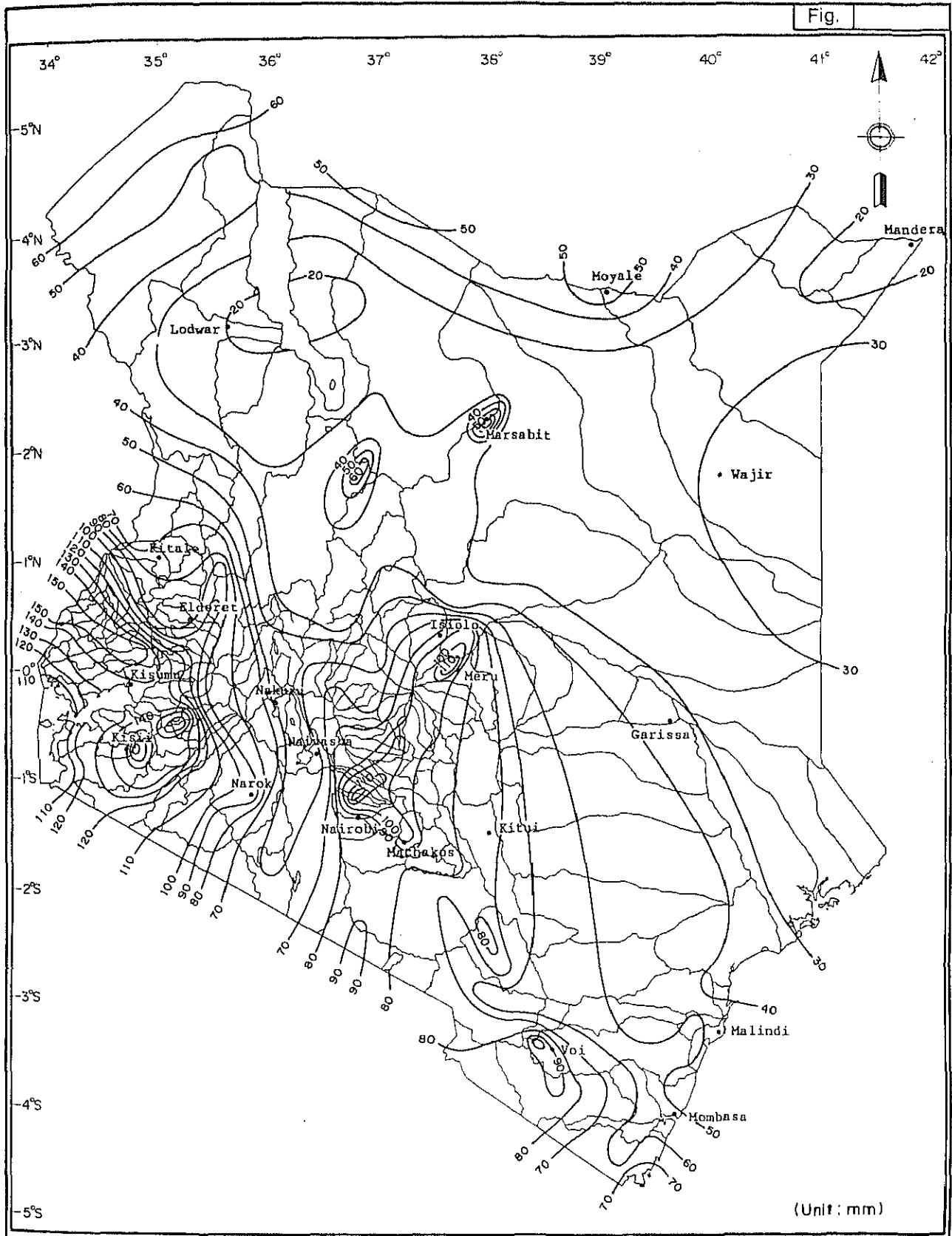


Figure B.2.3 Isohyetal Map of Monthly Mean Rainfall (March)

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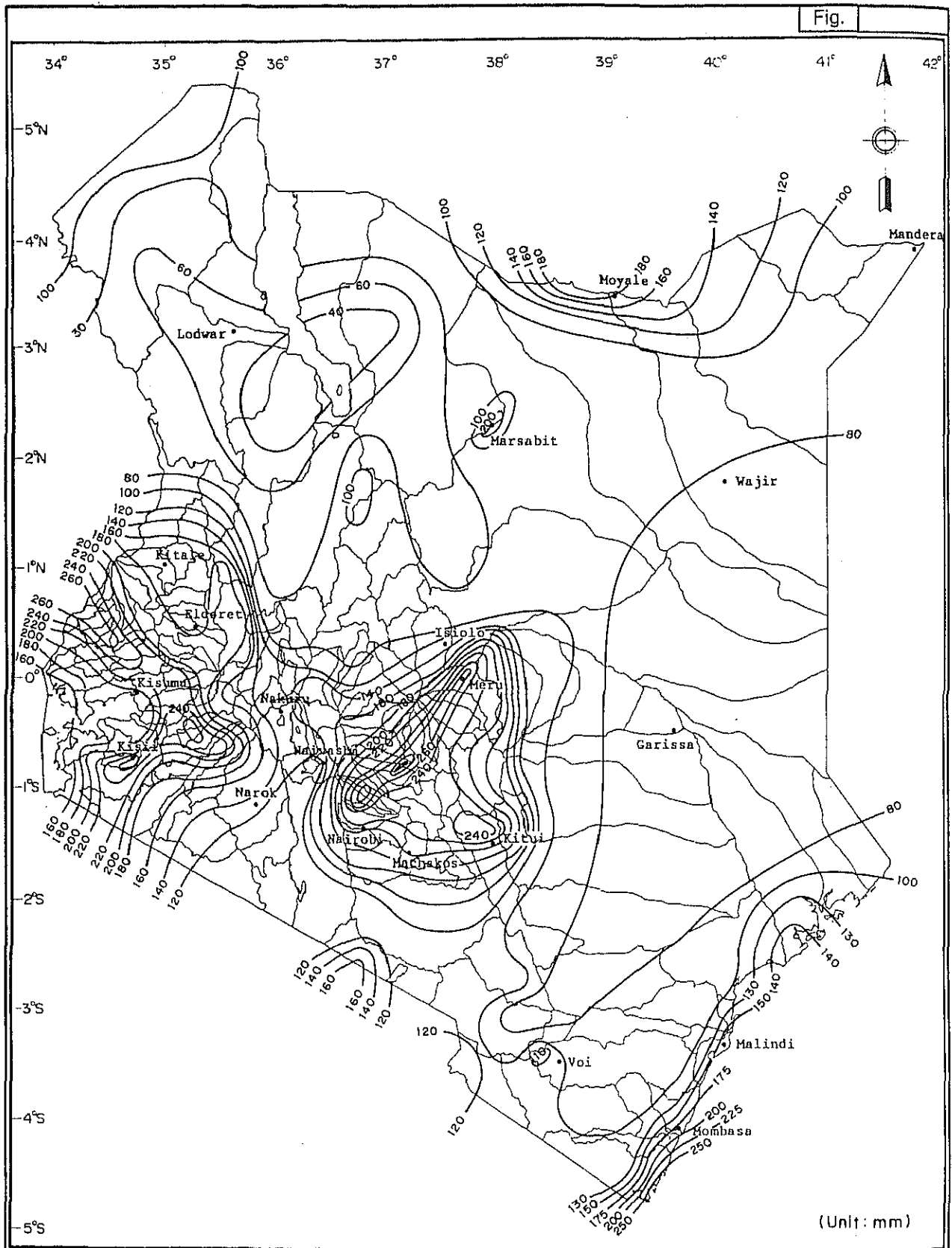


Figure B.2.4 Isohyetal Map of Monthly Mean Rainfall (April)

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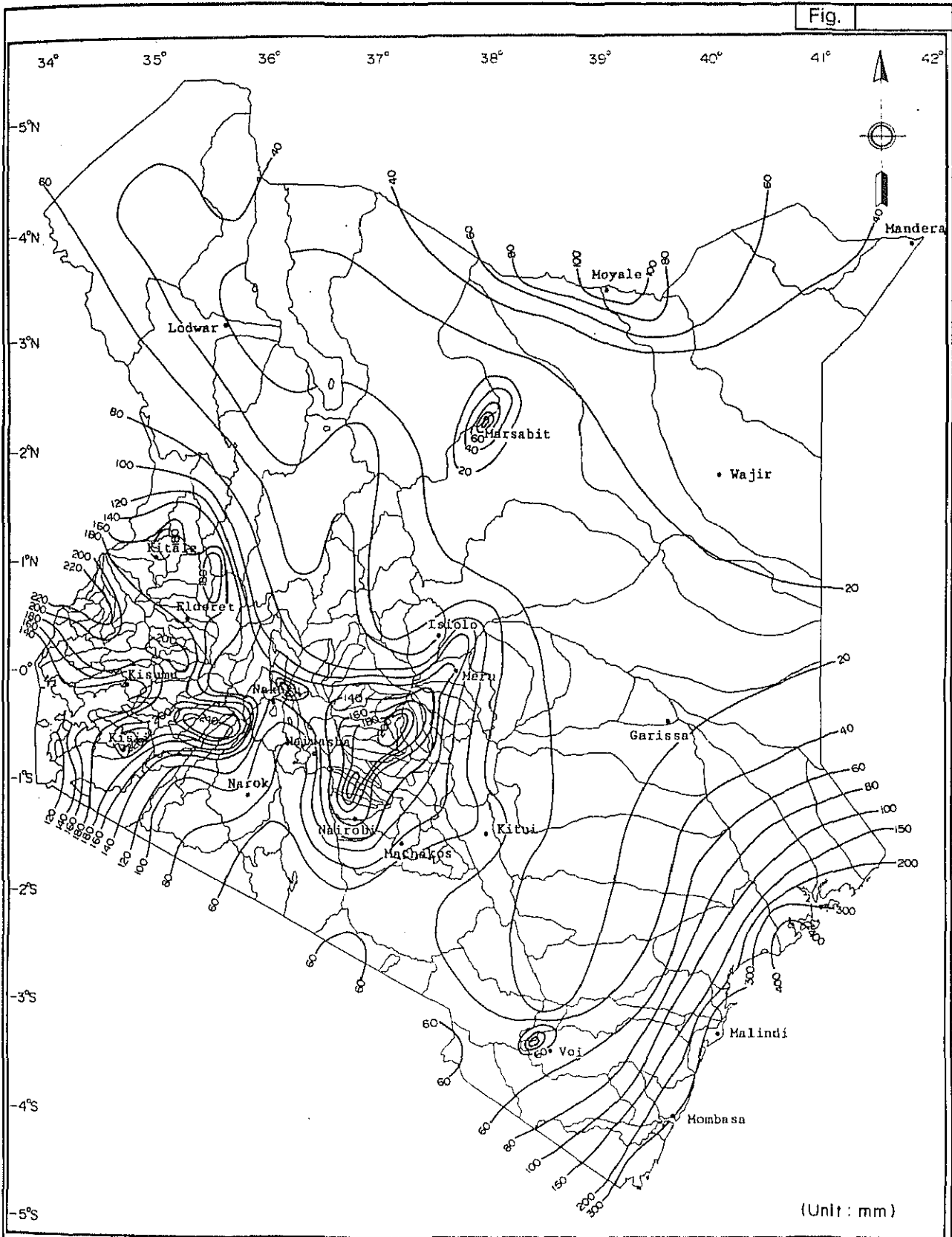


Figure B.2.5 Isohyetal Map of Monthly Mean Rainfall (May)

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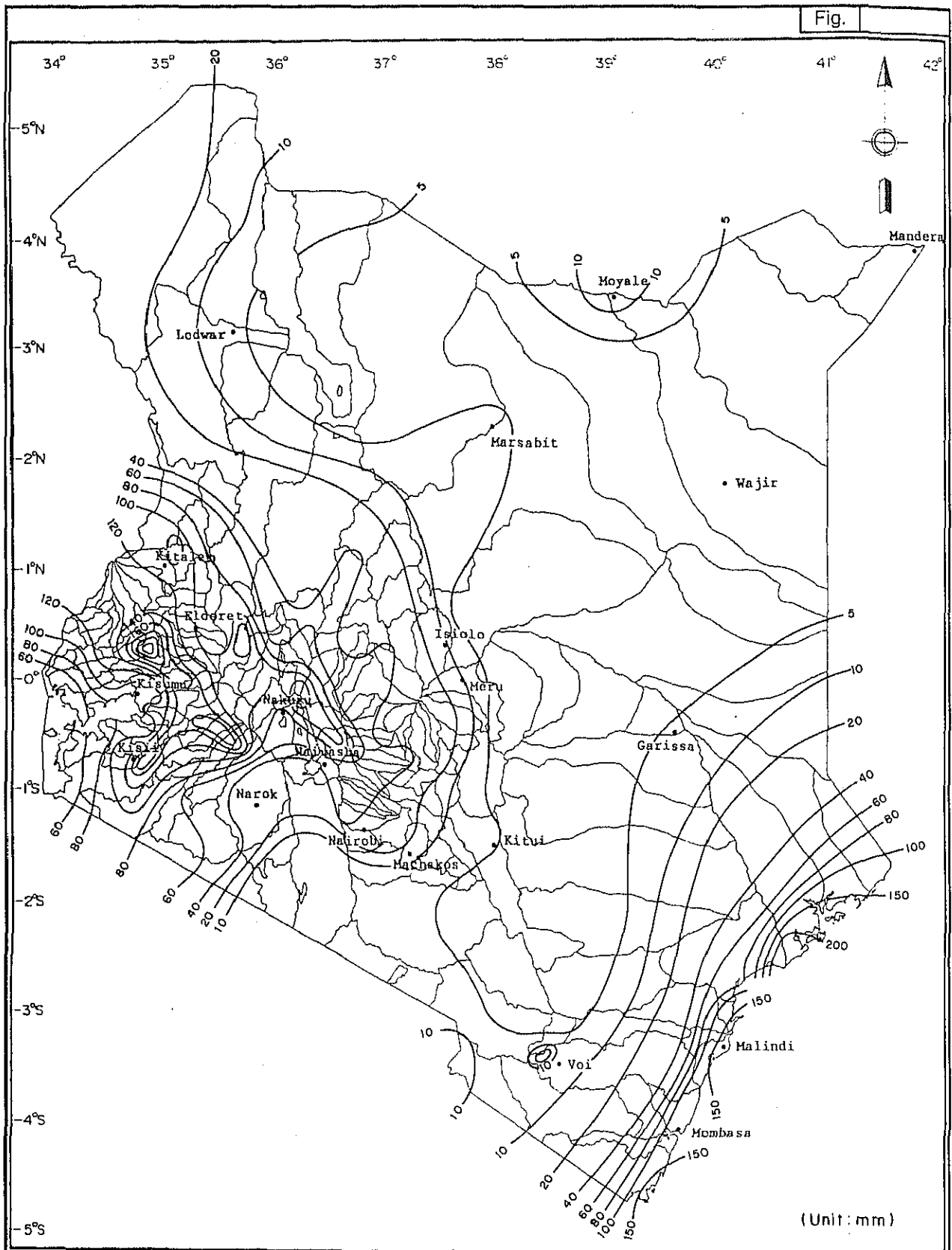


Figure B.2.6 Isohyetal Map of Monthly Mean Rainfall (June)

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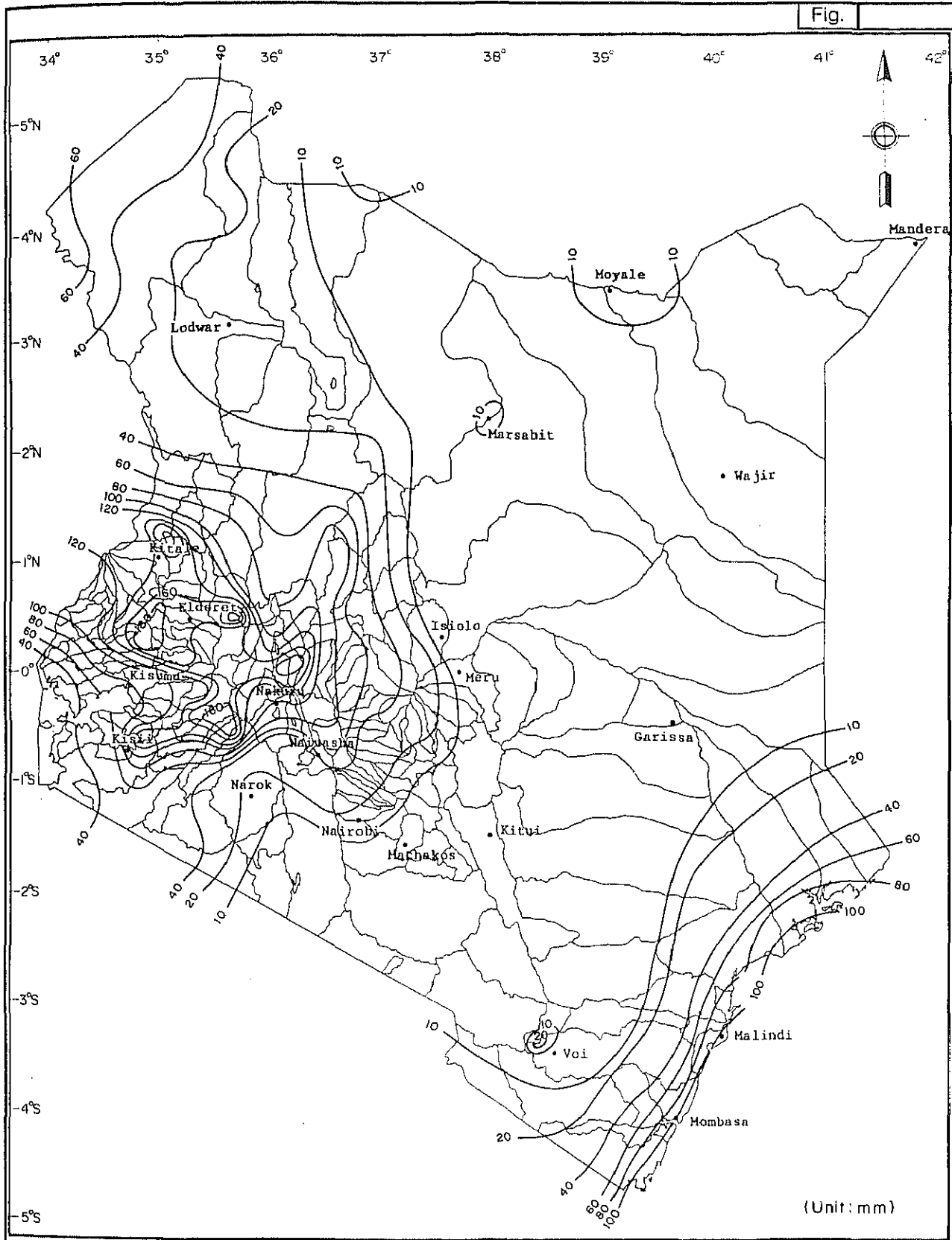


Figure B.2.7 Isohyetal Map of Monthly Mean Rainfall (July)

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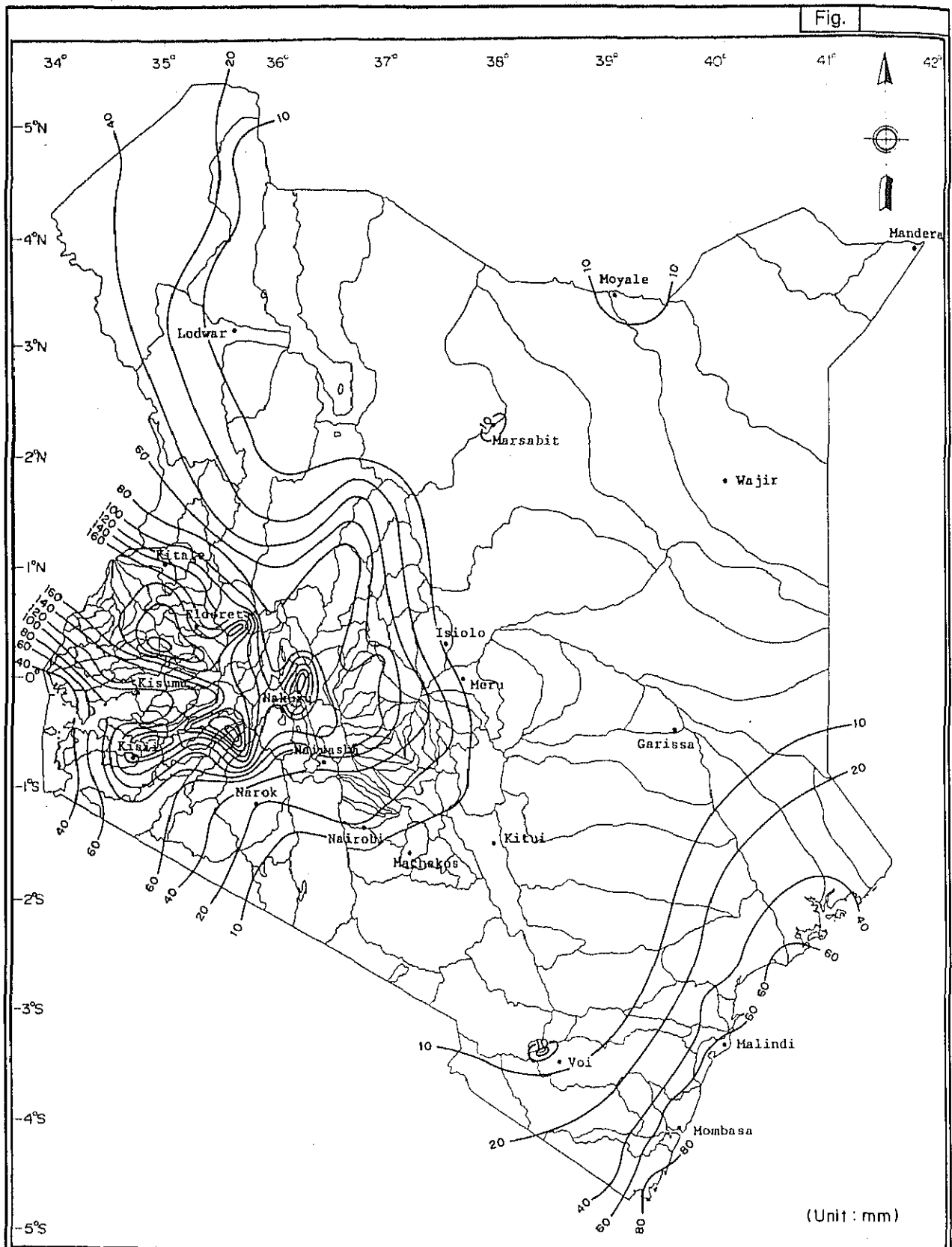


Figure B.2.8 Isohyetal Map of Monthly Mean Rainfall (August)

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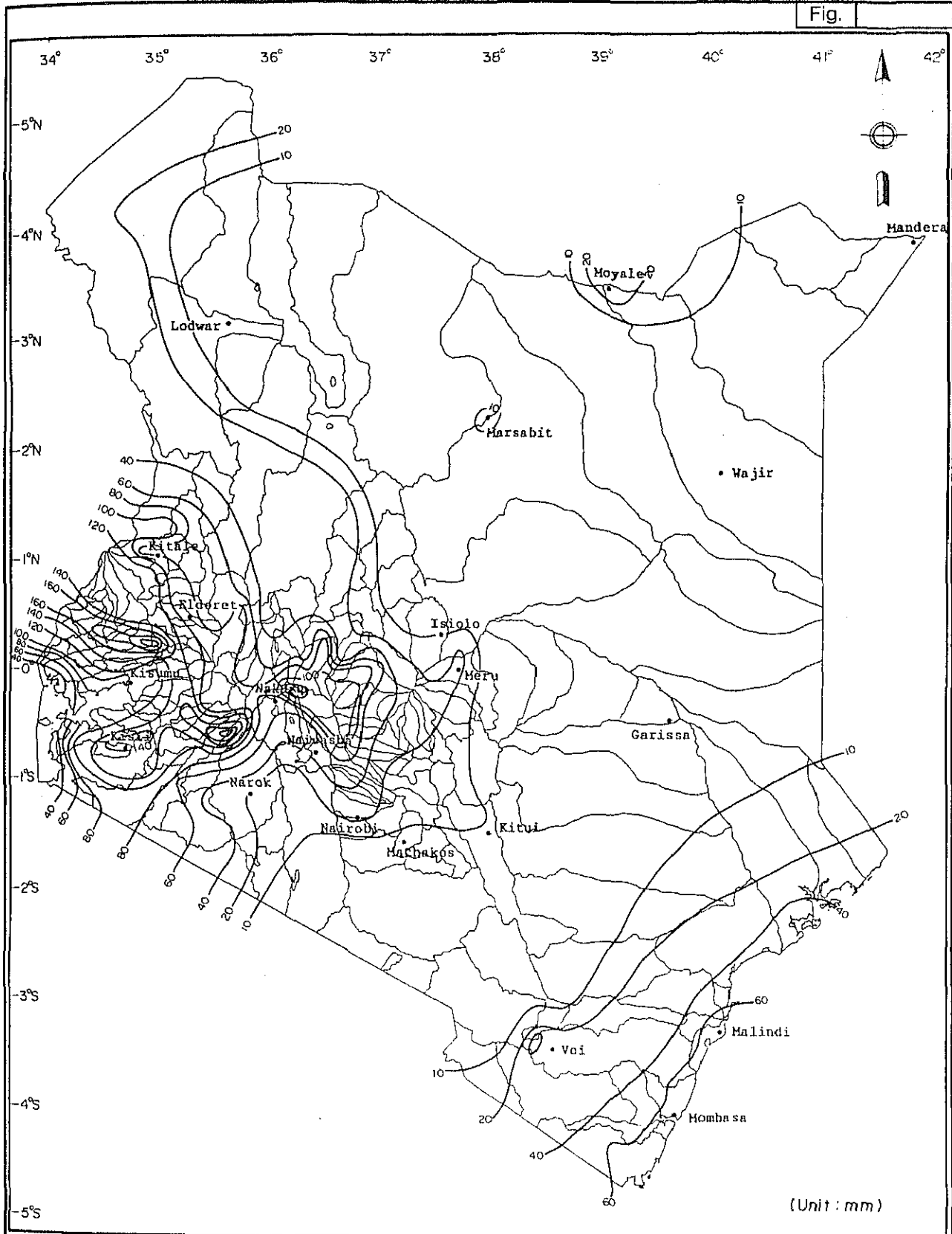


Figure B.2.9 Isohyetal Map of Monthly Mean Rainfall (September)

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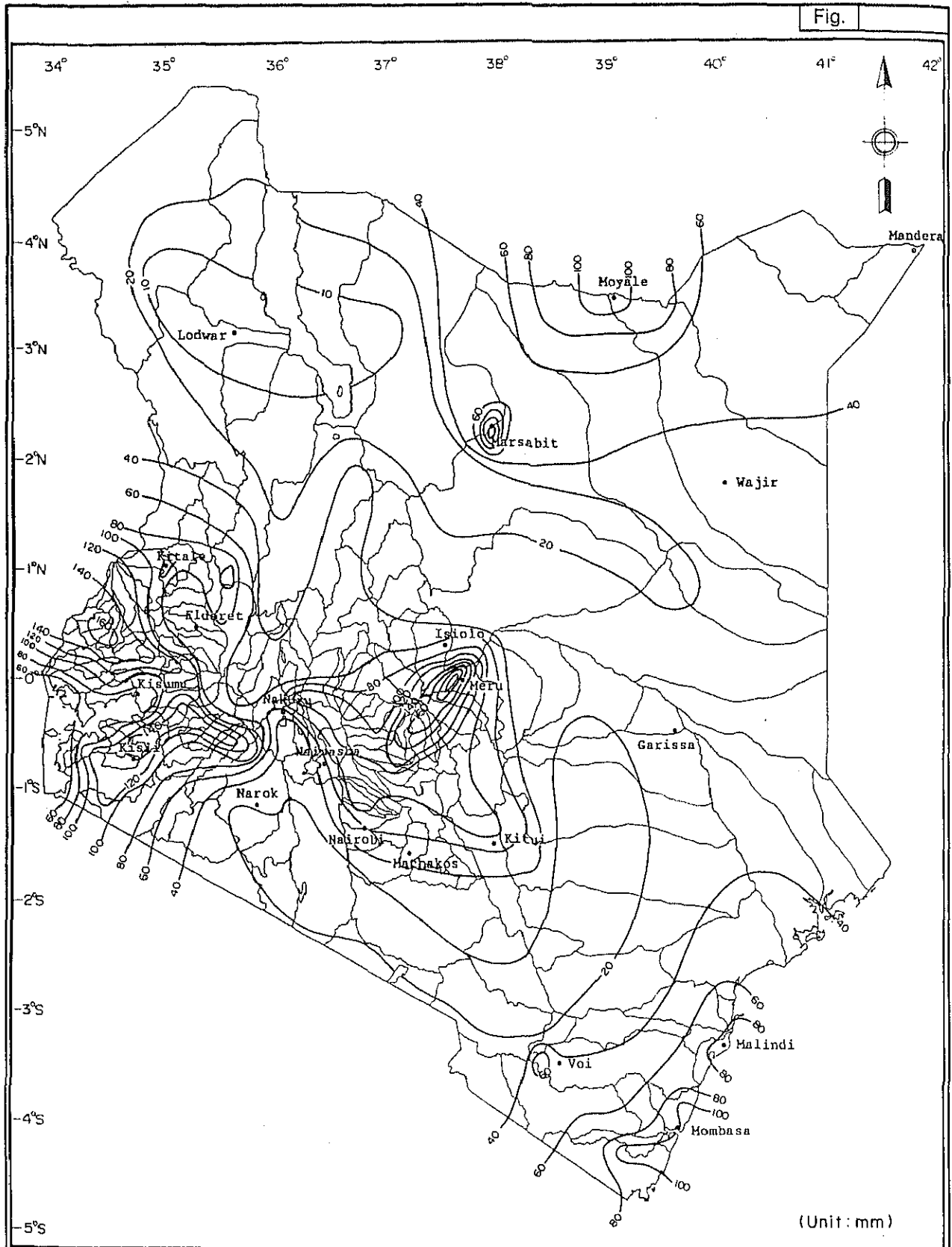


Figure B.2.10 Isohyetal Map of Monthly Mean Rainfall (October)

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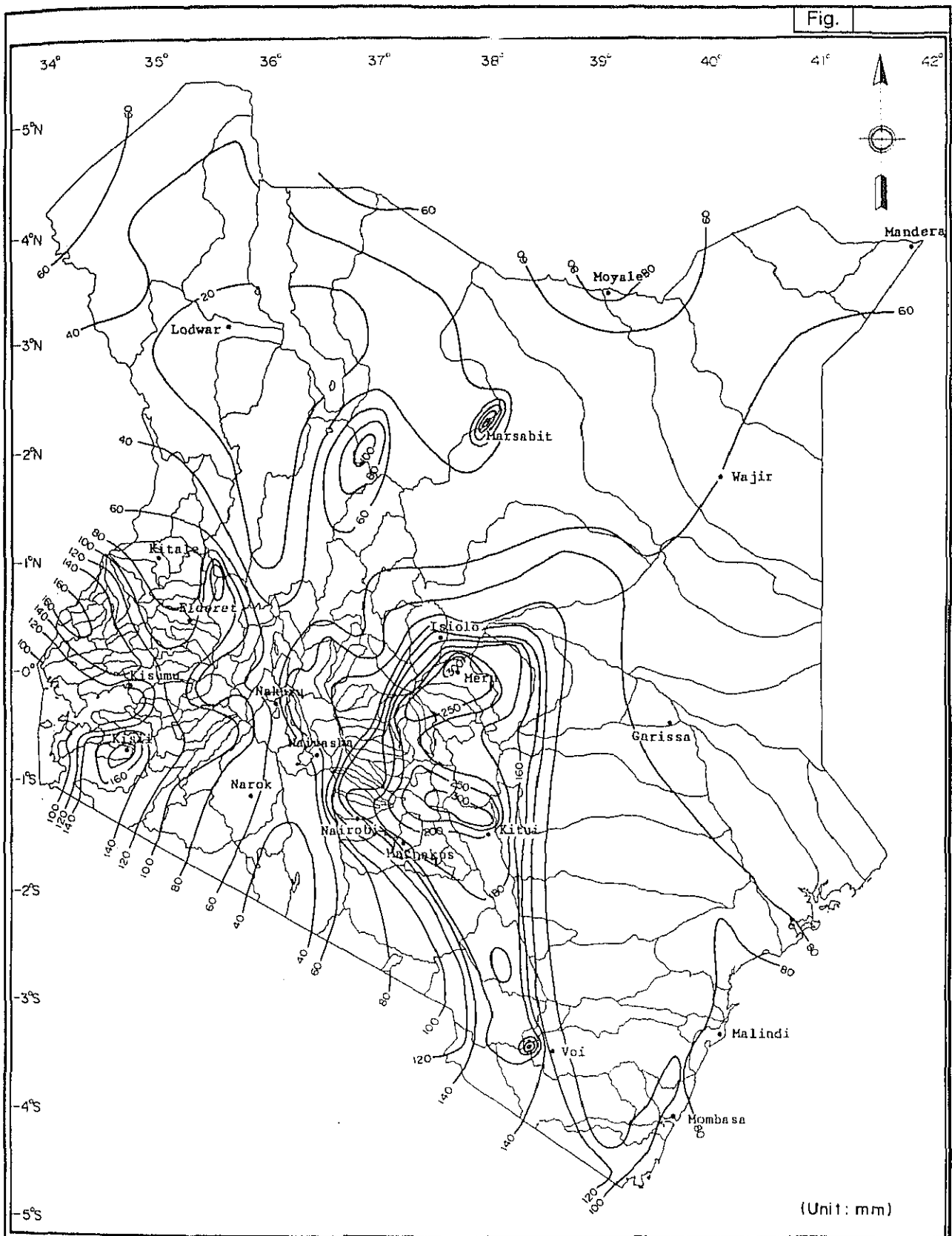


Figure B.2.11 Isohyetal Map of Monthly Mean Rainfall (November)

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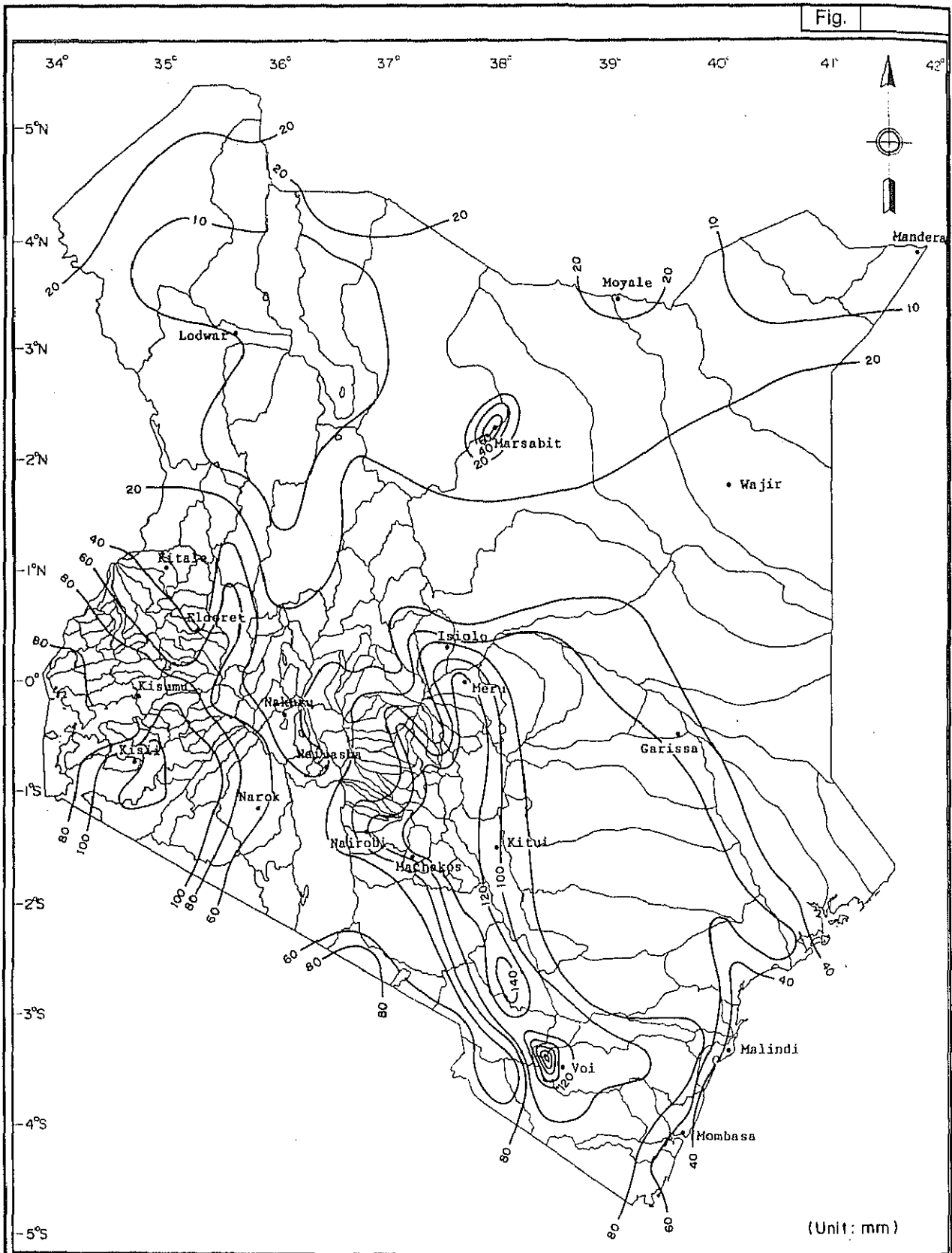


Figure B.2.12 Isohyetal Map of Monthly Mean Rainfall (December)

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APPENDIX B.3

Diurnal Variation of Hourly Rainfall

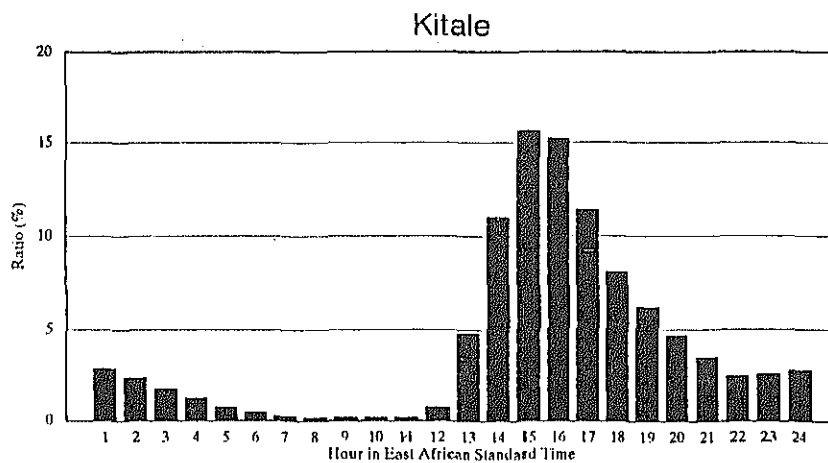
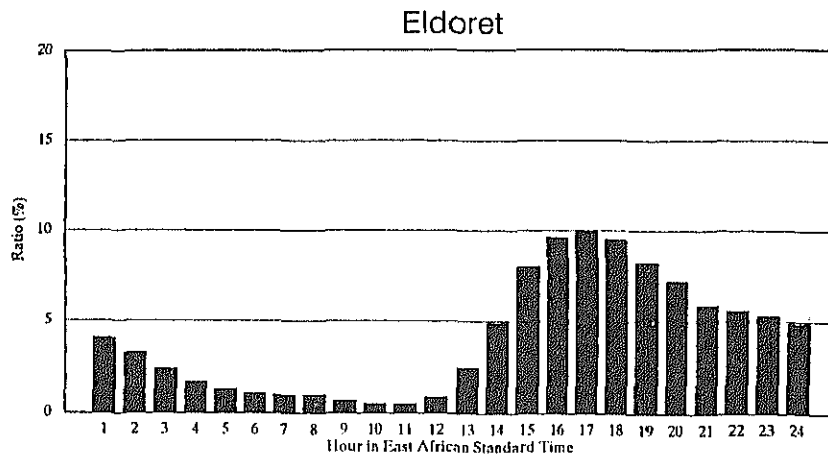
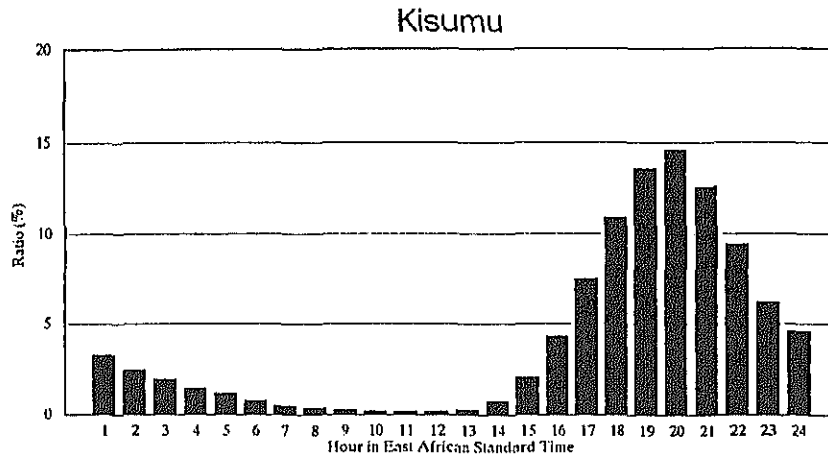


Figure B.3.1 Diurnal Variation of Hourly Rainfall (1/6)

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JAPAN INTERNATIONAL COOPERATION AGENCY

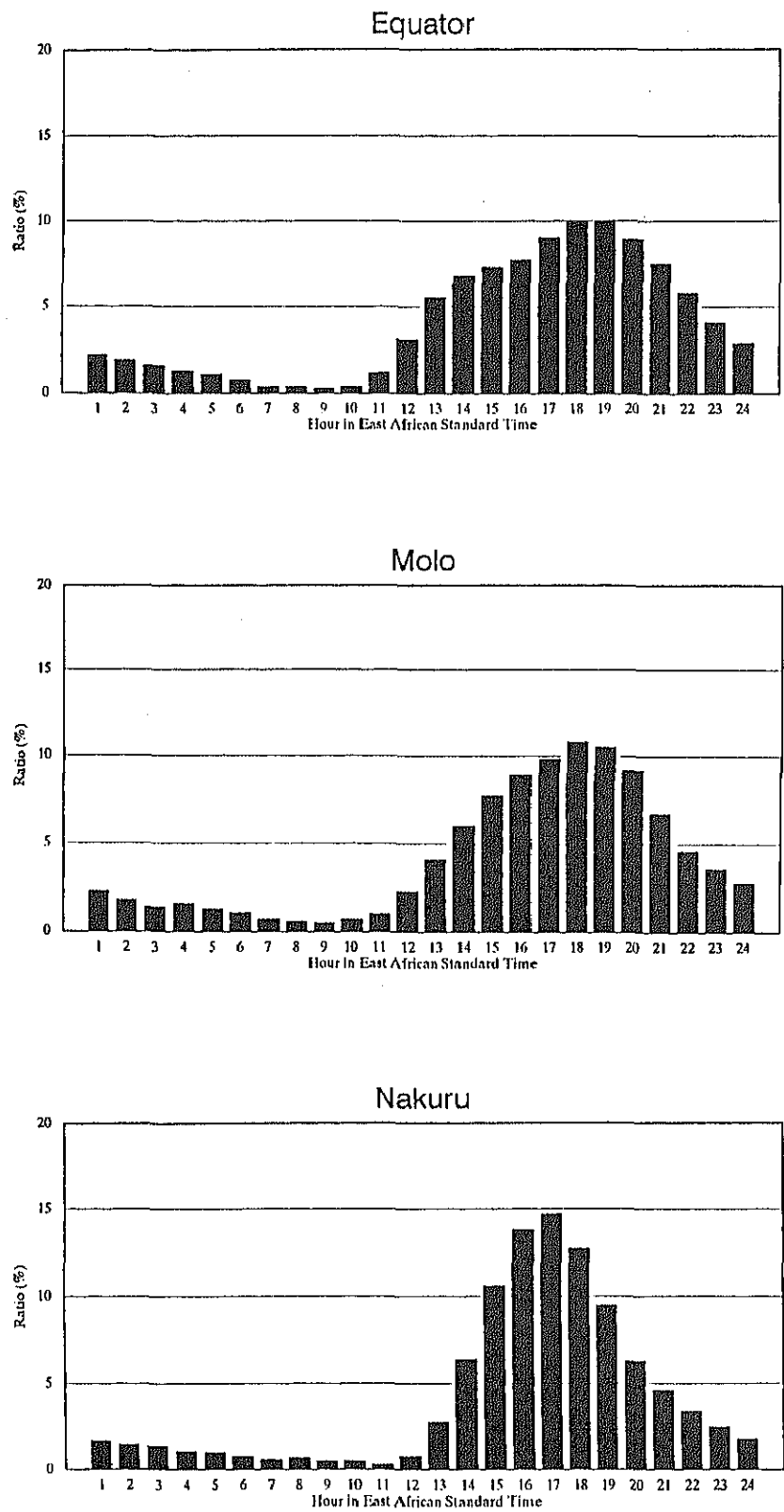


Figure B.3.2 Diurnal Variation of Hourly Rainfall (2/6)

THE STUDY
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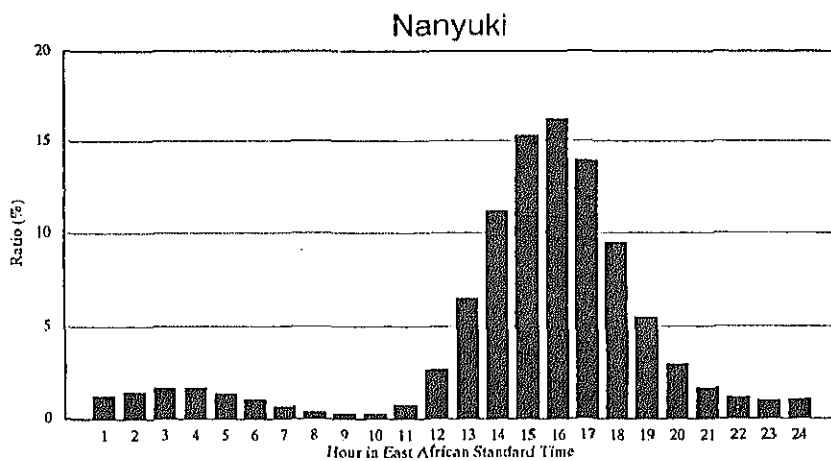
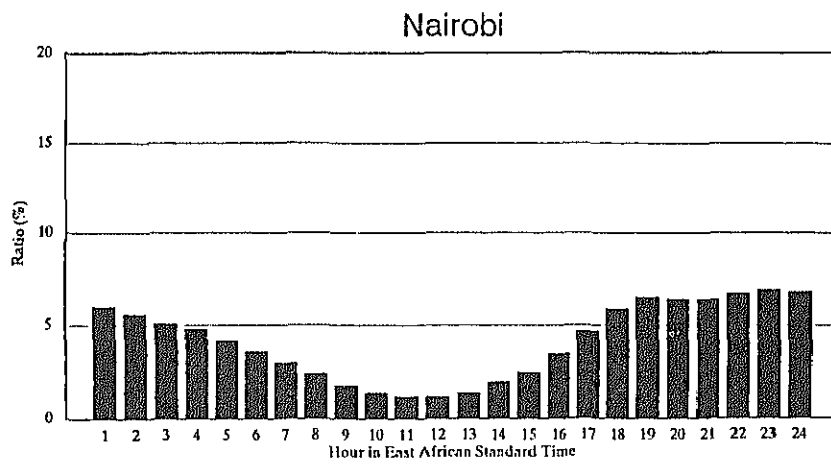
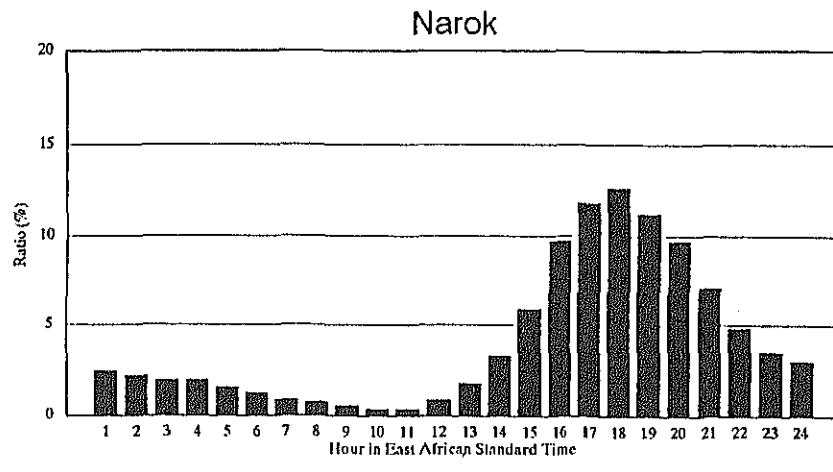


Figure B.3.3 Diurnal Variation of Hourly Rainfall (3/6)

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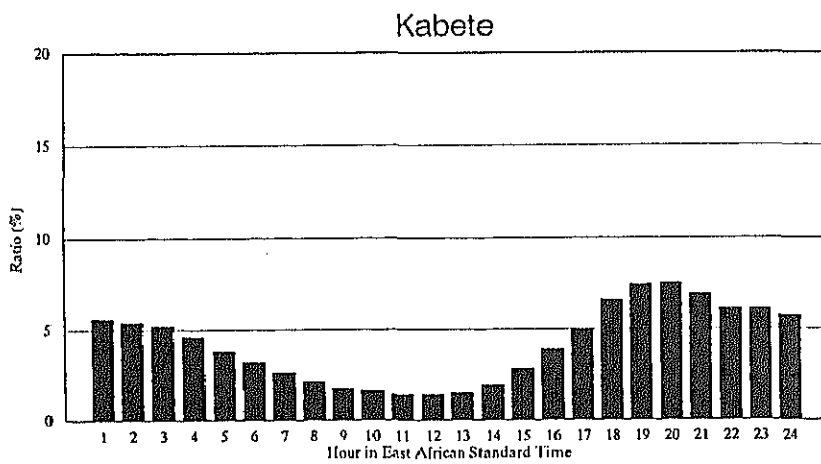
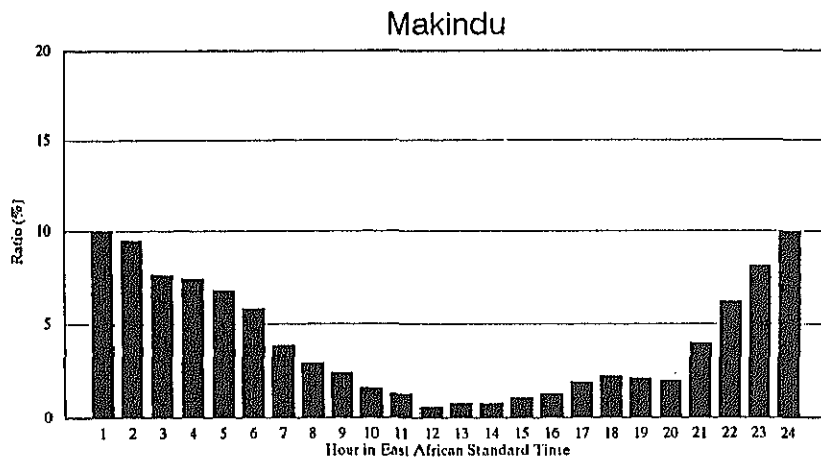
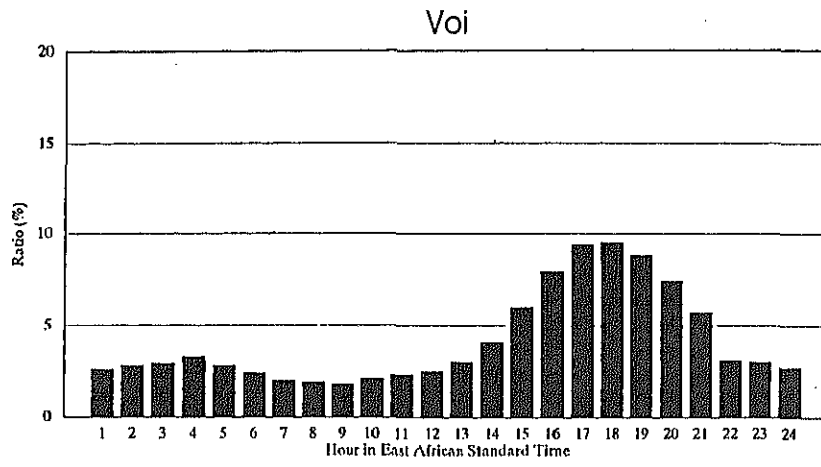


Figure B.3.4 Diurnal Variation of Hourly Rainfall (4/6)

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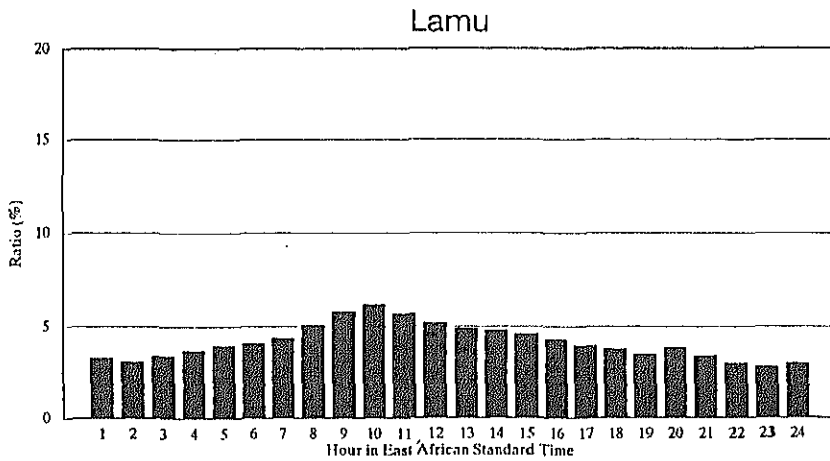
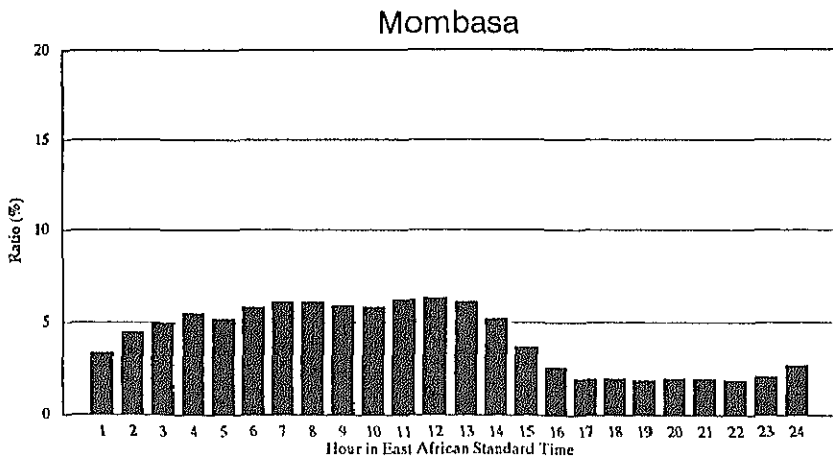
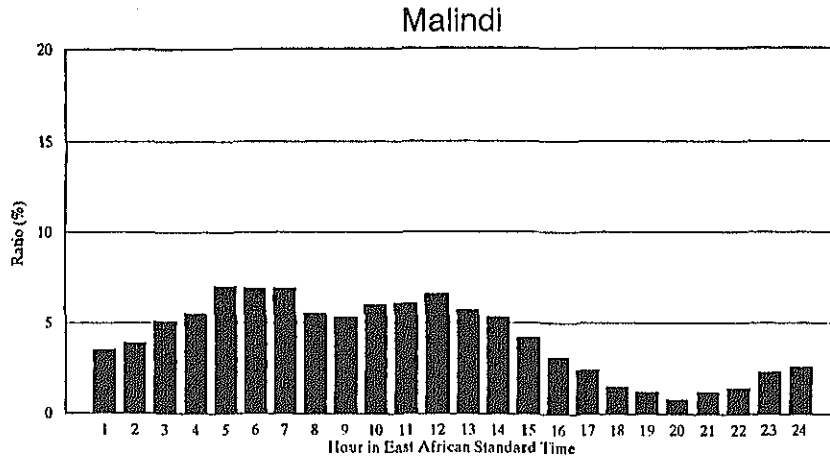


Figure B.3.5 Diurnal Variation of Hourly Rainfall (5/6)

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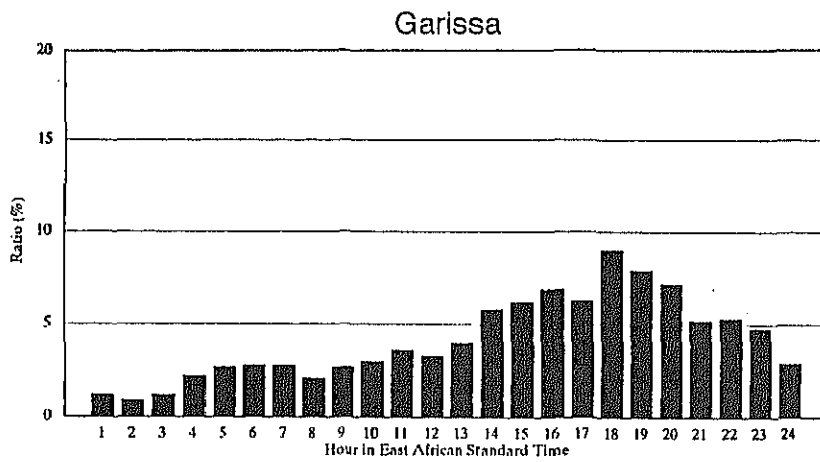
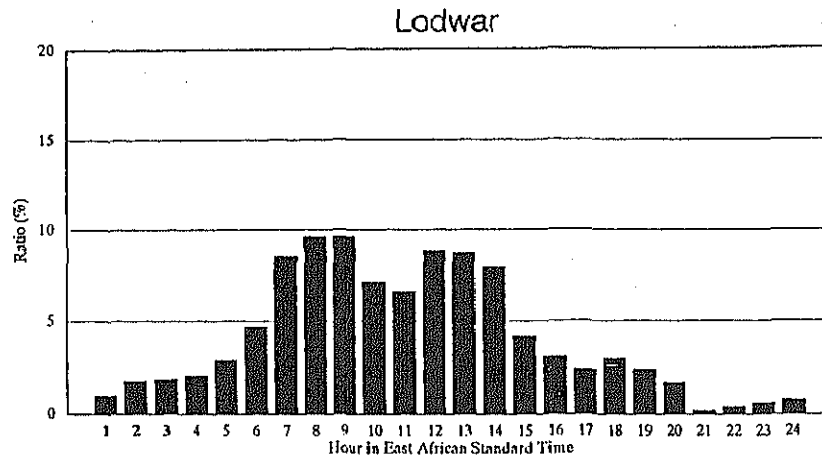


Figure B.3.6 Diurnal Variation of Hourly Rainfall (6/6)

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APPENDIX B.4

Basin Information Table

BASIN INFORMATION TABLE (1-1)

DRAINAGE AREA 1

Number	Basin		Main River		Area (sq.km)			River Length (km)
	Code	Code Order		Name	Basin	Right	Left	
1053	1AA				246			
1054	1AB	10197	0	Malikisi	293			35
1055	1AC	10725	1L	Toloso	120			23
1056	1AD	10197	0	Malikisi	222			38
				TOTAL	635			61
1057	1AG	10719	0	Sio	359	60	299	45
1058	1AF		1R	Naliwatsi	411	121	290	38
1059	1AH	10719	0	Sio	564	216	348	40
				TOTAL	1,334	687	647	85

BASIN INFORMATION TABLE (1-2)

DRAINAGE AREA 1

Number	Basin		Order	Main River Name	Area (sq.km)			River Length (km)
	Code	Code			Basin	Right	Left	
1001	1BA	10002	0	Nzoia	628	252	376	27
1002	1BB	10002	0	Nzoia	865	597	268	50
		(1001-1002		Subtotal)	1,493	849	644	77
1003	1BC	10186	1R	Noigameget	770	291	479	50
		(1001-1003		Subtotal)	2,263	1,619	644	77
1004	1BE	10002	0	Nzoia	1,011	920	91	41
		(1001-1004		Subtotal)	3,274	2,539	735	118
1005	1BD	10002	0	Nzoia	678	59	619	26
		(1001-1005		Subtotal)	3,952	2,598	1,354	144
1006	1BG	10002	0	Nzoia	907	846	61	22
		(1001-1006		Subtotal)	4,859	3,444	1,415	166
1007	1BH	10698	1R	Kibisi	618			65
1008	1CC	10006	1L	Kipkarren	664	251	413	60
1009	1CD	10006	1L	Kipkarren	521	210	311	53
		(1008-1009		Subtotal)	1,185	461	724	113
1010	1CA	10004	3R	Sergoit	684			81
1011	1CB	10005	2R	Sosian	671			85
		(1008-1011		Subtotal)	2,540	1,816	724	113
1012	1CE	10006	1L	Kipkarren	231	115	116	23
		(1008-1012		Subtotal)	2,771	1,931	840	136
		(1001-1012		Subtotal)	8,248	4,062	4,186	170
1013	1DA	10002	0	Nzoia	520	83	437	42
		(1001-1013		Subtotal)	8,768	4,145	4,623	212
1014	1DB	10286	1R	Kuywa	696	313	383	85
		(1001-1014		Subtotal)	9,464	4,841	4,623	212
1015	1DC	10002	0	Nzoia	373	218	155	23
		(1001-1015		Subtotal)	9,837	5,059	4,778	235
1016	1DD	10002	0	Nzoia	355	273	82	20
		(1001-1016		Subtotal)	10,192	5,332	4,860	255

BASIN INFORMATION TABLE (1-3)

DRAINAGE AREA 1

Number	Basin		Main River		Area (sq.km)			River Length
	Code	Code Order		Name	Basin	Right	Left	(km)
1017	1EA	10011	1L	Isiukhu	429	78	351	35
1018	1EB	10011	1L	Isiukhu	380	191	189	38
		(1017-1018		Subtotal)	809	269	540	73
1019	1EC	10012	2R	Lusumu	250			48
		(1017-1019		Subtotal)	1,059	519	540	73
1020	1ED	10012	1L	Lusumu	128	40	88	20
		(1017-1020		Subtotal)	1,187	559	648	93
		(1001-1020		Subtotal)	11,379	5,332	6,047	251
1021	1EE	10002	0	Nzoia	401	186	215	35
		(1001-1021		Subtotal)	11,780	5,518	6,262	286
1022	1EG	10826	1L	Wuoroya	544			48
		(1001-1022		Subtotal)	12,324	5,518	6,806	286
1023	1EF	10002	0	Nzoia	385	245	140	48
				TOTAL	12,709	5,763	6,946	334

BASIN INFORMATION TABLE (1-4)

DRAINAGE AREA 1

Number	Basin		Main River		Area (sq.km)			River
	Code	Code Order		Name	Basin	Right	Left	Length (km)
1024	1FA	10260	0	Sambul	246	42	204	7
1025	1FB	10418	0	Kimondi	378	283	95	34
		(1024-1025		Subtotal)	624	325	299	41
1026	1FC	10418	0	Kimondi	272	119	153	25
		(1024-1026		Subtotal)	896	444	452	66
1027	1FD	10196	1L	Sirua	480	103	377	55
		(1024-1027		Subtotal)	1,376	444	932	66
1028	1FE	10003	0	Yala	652	132	520	82
		(1024-1028		Subtotal)	2,028	576	1,452	148
1029	1FF	10010	1L	Edzawa	272			38
		(1024-1029		Subtotal)	2,300	576	1,724	148
1030	1FG	10003	0	Yala	980	633	347	71
				TOTAL	3,280	1,209	2,071	219

BASIN INFORMATION TABLE (1-5)

DRAINAGE AREA 1

Number	Basin		Main River		Area (sq.km)			River
	Code	Code Order		Name	Basin	Right	Left	Length (km)
1031	1GC	10019	0	Nyando	912	121	791	76
1032	1GG	10188	1R	Malaget	374	327	47	45
		(1031-1032		Subtotal)	1,286	495	791	76
1033	1GA	10300	1R	Kipkurere	443	36	407	48
1034	1GB	10300	0	Nyando	518	402	116	20
		(1031-1034		Subtotal)	2,247	1,340	907	96
1035	1GE		1L	Awach Kano	391			35
1036	1GF		1L	Asawo	260			20
1037	1GD	10019	0	Nyando	720	87	633	74
				TOTAL	3,618	1,427	1,951	170

BASIN INFORMATION TABLE (1-6)

DRAINAGE AREA 1

Number	Basin		Main River Order	Name	Area (sq.km)			River Length (km)
	Code	Code			Basin	Right	Left	
1060	1HA	10842	0	Luando	869			58
1060	1HB		0	Awach Seme	762			26
1062	1HC				521			
1063	1HD		0	Awach Kibuon	778			58
1064	1HE	10799	0	Awach Tende	761			50
1065	1HF		0	Lambwe	846			35
1066	1HG				333			
1038	1JA	10199	0	Itare	748	281	467	68
1039	1JB	10199	0	Itare	262	199	63	18
		(1038-1039		Subtotal)	1,010	480	530	86
1040	1JC		1R	Kitoi	339			50
		(1038-1040		Subtotal)	1,349	819	530	86
1041	1JD	10023	0	Yurith	213	148	65	15
		(1038-1041		Subtotal)	1,562	967	595	101
1042	1JE	10177	2L	Sisi	601			43
1043	1JF	10021	1L	Kopsonoi	1,006	453	553	149
		(1042-1043		Subtotal)	1,607	453	1,154	149
		(1038-1043		Subtotal)	3,169	967	2,202	101
1044	1JG	10151	0	Sondu	312	86	226	69
				TOTAL	3,481	1,053	2,428	170

BASIN INFORMATION TABLE (1-7)

DRAINAGE AREA 1

Number	Basin		Order	Main River	Area (sq.km)			River
	Code	Code		Name	Basin	Right	Left	Length (km)
1045	1KA	10008	0	Kuja	463	123	340	45
1046	1KB	10008	0	Kuja	3,558	778	2,780	176
1047	1KC	10362	1L	Migori	2,898	1,102	1,796	189
				TOTAL	6,919	901	6,018	221
1048	1LB1	10318	0	Amala	1,449	667	782	129
1049	1LA1	10419	1R	Nyangoris	914	216	698	113
		(1048-1049		Subtotal)	2,363	1,581	782	129
1050	1LA2	10644	0	Mara	1,003	548	455	117
		(1048-1050		Subtotal)	3,366	2,129	1,237	246
1051	1LB2		1L	Talek	2,715	2,218	497	90
		(1048-1051		Subtotal)	6,081	2,129	3,952	246
1052	1LA3		0	Mara	2,886	442	2,444	24
				TOTAL	8,967	2,571	6,396	270

BASIN INFORMATION TABLE (2-1)

DRAINAGE AREA 2

Number	Basin		Main River Order	Name	Area (sq. km)			River Length (km)
	Code	Code			Basin	Right	Left	
2001	2AA			Lake Turkana East	11,498			
2002	2AB			Lake Turkana West	9,853			
2003	2BC	20219	0	Turkwell	3,827	1,956	1,871	170
2004	2BA		2L	Muruny	1,352			68
2005	2BB	20280	1R	Malmaltek	2,038	1,086	952	95
2006	2BD	20129	0	Turkwell	13,251	3,756	9,515	220
				TOTAL	20,468	9,102	11,386	390
2007	2CB	20149	0	Kerio	2,380	1,537	843	139
2008	2CC	20149	0	Kerio		5,173	6,263	420
				TOTAL	13,816	6,710	7,106	559
2009	2CA		0	Lomunyenkupurat	3,571			110
2010	2D	20343	0	Suguta	12,965			200
2011	2EA	20301	0	Waseges	412			30
2012	2EB	20301	0	Waseges(L.Bogoria)	725			
				TOTAL	1,138			
2013	2EC	20003	1R	Rangai	826			65
2014	2EG1	20002	0	Molo	397			23
2015	2EG2	20002	0	Molo	1,264			100
				TOTAL	2,487			123
2016	2ED	20168	0	Perkerra	421			23
2017	2EF		1R	Emining	389			50
2018	2EE	20168	0	Perkerra	601			80
				TOTAL	1,411			103

BASIN INFORMATION TABLE (2-2)

DRAINAGE AREA 2

Number	Basin		Main River		Area (sq.km)			River
	Code	Code	Order	Name	Basin	Right	Left	Length (km)
2019	2EH	20244	0	Ndau(L.Baringo West)	604			
2020	2EJ	20206	0	Mukutan(L.Baringo E)	1,419			
2021	2EK	20095	0	Ol Arabel	603			60
2022	2FA	20009	0	Meroroni(L.Elmentei)	548			
2023	2FB	20012	0	Crater Stream	143			
2024	2FC	20015	0	Makalia(L.Nakuru)	1,514			
2025	2GA	20004	0	Gilgil	323			55
2026	2GC	20008	1L	Turasha	753			53
2027	2GB	20005	0	Malewa	963			75
2028	2GD	20018		Karati(L.Naivasha)	1,153			
				TOTAL (2027-2028)	1,716			75
2029	2H				8,215			
2030	2KA	20130	0	Ewaso Ngiro	5,092	1,789	3,303	169
2031	2KB	20130	0	Ewaso Ngiro	1,636	755	881	55
2032	2KC	20130	0	Ewaso Ngiro	1,994	1,561	433	63
				TOTAL	8,722	4,043	4,679	287

BASIN INFORMATION TABLE (3-1)

DRAINAGE AREA 3

Number	Basin		Main River		Area (sq.km)			River Length
	Code	Code Order		Name	Basin	Right	Left	(km)
3001	3AB	30100	0	Stony Athi	1,786	996	790	55
3002	3AA	30002	1L	Athi	697			50
		(3001-3002)		Subtotal)	2,483	996	1,487	55
3003	3BB	30006	2L	Kamiti	256			50
3004	3BC		3R	Ruiru	476			65
3005	3BD	30007	2L	Thiririka	328			73
3006	3BA	30004	1L	Nairobi	830	334	496	65
		(3003-3006)		Subtotal)	1,890	334	1,556	
3007	3CB	30003	1L	Ndarugu	395			78
3008	3AC	30002	0	Athi	887	734	153	52
		(3001-3008)		Subtotal)	5,655	2,064	3,591	107
3009	3DA	30002	0	Athi	807	655	152	63
		(3001-3009)		Subtotal)	6,462	2,719	3,743	170
3010	3DB	30002	0	Athi	822	407	415	76
		(3001-3010)		Subtotal)	7,284	3,126	4,158	246
3011	3EA	30300	1R	Thwake	875	537	338	35
3012	3EB	30300	1R	Thwake	804	529	275	33
3013	3EC	30235	2R	Kaiti	671			65
3014	3ED	30300	1R	Thwake	570	307	263	45
		(3011-3014)		Subtotal)	2,920	2,044	876	113
		(3001-3014)		Subtotal)	10,204	6,046	4,158	246
3015	3FA1	30002	0	Athi	738	448	290	53
3016	3FA2	30081	1R	Kiboko	9,257	2,723	6,534	220
		(3001-3016)		Subtotal)	20,199	15,751	4,448	299
3017	3FB	30002	0	Athi	4,196	3,587	609	138
		(3001-3017)		Subtotal)	24,395	19,338	5,057	437
3018	3G	30088	1R	Tsavo	6,306	4,614	1,692	153
		(3001-3017)		Subtotal)	30,701	25,644	5,057	437
3019	3HA	30118	0	Galana	921	782	139	29
		(3001-3019)		Subtotal)	31,622	26,426	5,196	466
3020	3HB	30118	0	Galana	2,498	1,768	730	159
		(3001-3020)		Subtotal)	34,120	28,194	5,926	625

BASIN INFORMATION TABLE (3-2)

DRAINAGE AREA 3

Number	Basin		Order	Main River	Area (sq.km)			River Length
	Code	Code		Name	Basin	Right	Left	(km)
3021	3HC	30239	1L	Koromi	2,942			65
3022	3HD	30118	0	Galana	627	543	84	63
				TOTAL	37,689	28,737	8,952	688
3025	3L	30147	0	Rare	8,076	4,136	3,940	243
3025	3MA	30550	0	Mwachi	6,120	2,164	3,956	185
3027	3MB	30550	0	Mwachi	1,700	354	1,346	80
				TOTAL	7,820	2,518	5,302	265
3026	3MC	30084	0	Shimba	1,044			101
3027	3MD	30550	0	Mwachi	1,449			8
3028	3J	30076	0	Lumi	3,022			73
3029	3K	30563	0	Ramisi	4,176			111
3030	3N	30085	0	Namanga	3,175			80

BASIN INFORMATION TABLE (4-1)

DRAINAGE AREA 4

Number	Basin		Main River Name	Area (sq.km)			River Length (km)
	Code	Code Order		Basin	Right	Left	
4001	4AA	40007 0	Sagana	519	184	335	46
4002	4AB	40016 1R	Amboni	684			59
4003	4AC	40007 0	Sagana	429	375	54	21
4004	4AD	40235 1R	Gura	441			58
		(4001-4004	Subtotal)	2,073	1,684	389	67
4005	4BA	40007 0	Sagana	317	208	109	34
4006	4BB	40026 1L	Ragati	259			58
		(4001-4006	Subtotal)	2,649	1,892	757	101
4007	4BC	40002 0	Tana	227	28	199	17
4008	4BD	40006 1R	Mathioya	547			70
		(4001-4008	Subtotal)	3,423	2,467	956	118
4009	4BE	40002 0	Tana	554	517	37	18
4010	4BF	40031 1R	Saba Saba	374			58
		(4001-4010	Subtotal)	4,351	3,358	993	136
4011	4BG	40002 0	Tana	443	293	150	29
		(4001-4011	Subtotal)	4,794	3,651	1,143	165
4012	4CB	40003 1R	Thika	313	186	127	60
4013	4CA	40004 2R	Chania	537			73
4014	4CC	40003 1R	Thika	1,019	426	593	88
		(4012-4014	Subtotal)	1,869	1,149	720	148
		(4001-4014	Subtotal)	6,663	5,520	1,143	165
4015	4DE	40002 0	Tana	735	660	75	36
		(4001-4015	Subtotal)	7,398	6,180	1,218	201
4016	4DA	40008 1L	Thiba	715	425	290	78
4017	4DB	40091 2L	Nyamindi	453			78
4018	4DC	40009 3L	Rubingazi	354			78
4019	4DD	40008 1L	Thiba	452	126	326	28
		(4016-4019	Subtotal)	1,974	551	1,423	106
		(4001-4019	Subtotal)	9,372	6,180	3,192	201
4020	4EC	40106 1L	Ena	605			68
4021	4ED	40002 0	Tana	3,160	2,394	766	86
		(4001-4021	Subtotal)	13,137	8,574	4,563	287

BASIN INFORMATION TABLE (4-2)

DRAINAGE AREA 4

Number	Basin		Main River	Area (sq.km)			River Length (km)
	Code	Code Order		Basin	Right	Left	
4022	4EB	49224	2R	Thuchi	1,193		80
4023	4EA	40172	1L	Mutonga	743	396 347	95
		(4022-4023		Subtotal)	1,936	1,589 347	95
		(4001-4023		Subtotal)	15,073	8,574 6,499	287
4024	4FA	40002	0	Tana	2,181	225 1,956	30
		(4001-4-24		Subtotal)	17,254	8,799 8,455	317
4025	4FB	40002	0	Tana	3,950	1,686 2,264	65
		(4001-4025		Subtotal)	21,204	10,485 10,719	382
4026	4GA	40002	0	Tana	3,909	1,193 2,716	37
		(4001-4026		Subtotal)	25,113	11,678 13,435	419
4027	4GB	40002	0	Tana	5,503	3,281 2,222	62
		(4001-4027		Subtotal)	30,616	14,959 15,657	481
4028	4GC	40002	0	Tana	1,823	1,102 721	77
		(4001-4028		Subtotal)	32,439	16,061 16,378	558
4029	4GD	40002	0	Tana	7,399	6,715 684	123
		(4001-4029		Subtotal)	39,838	22,776 17,062	681
4030	4GE	40002	0	Tana	11,732	11,275 457	61
		(4001-4030		Subtotal)	51,570	34,051 17,519	742
4031	4GF	40002	0	Tana	15,518	12,170 3,348	111
		(4001-4031		Subtotal)	67,088	46,221 20,867	853
4032	4HA	40105	1R	Tiva	5,480	2,378 3,102	175
4033	4HB		1R	Laga Kokani	9,066	3,410 5,656	265
		(4032-4033		Subtotal)	14,546	5,795 8,751	440
		(4001-4033		Subtotal)	81,634	60,767 20,867	853
4034	4GG	40002	0	Tana	7,120	5,889 1,331	126
				TOTAL	88,754	66,656 22,198	979
4035	4KA		0	Dodori	8,251	4,035 4,216	133
4036	4KB		0	Duldul	10,218		75
4037	4JA				8,489		
4038	4JB		0	Lac Garebey	3,691		113

BASIN INFORMATION TABLE (5-1)

DRAINAGE AREA 5

Number	Basin		Main River Name	Area (sq.km)			River Length (km)	
	Code	Code Order		Basin	Right	Left		
5001	5BB	50002	0	Ewaso Ngiro	452	263	189	58
5002	5BA		1R	Engare Moyok	269			32
		(5001-5002		Subtotal)	721	532	189	58
5003	5BC	50002	0	Ewaso Ngiro	1,636	957	679	76
		(5001-5003		Subtotal)	2,357	1,489	868	134
5004	5BD	50006	1L	Suguroi	674	446	228	70
5005	5BE	50003	1R	Nanyuki	1,238	963	275	66
5006	5AA	50051	1L	Ewaso Narok	1,247	612	635	68
5007	5AB	50009	2R	Pesi	482			51
5008	5AD	50028	2R	Mutara	517			63
5009	5AC	50051	1L	Ewaso Narok	1,085	391	694	61
		(5006-5009		Subtotal)	3,331	2,002	1,329	129
5010	5DC	50002	0	Ewaso Ngiro	1,268	545	723	57
		(5001-5010		Subtotal)	8,868	3,272	5,596	191
5011	5DB		1R	Kipsing	1,286	858	428	80
5012	5DD	50002	0	Ewaso Ngiro	1,883	682	1,201	63
		(5001-5012		Subtotal)	12,037	5,240	6,797	254
5013	5DA	50002	0	Ewaso Ngiro	2,237	2,107	130	24
		(5001-5013		Subtotal)	14,274	7,347	6,927	278
5014	5CA		1L	Seiyia	2,342	867	1,475	81
5015	5CB		1L	Seiyia	2,259	1,054	1,205	82
		(5014-5015		Subtotal)	4,601	1,921	1,680	163
5016	5CC	50185	2L	Milgis	3,005	1,784	1,221	72
		(5014-5016		Subtotal)	7,606	1,921	4,685	163
5017	5EA	50002	0	Ewaso Ngiro	25,393	12,633	12,760	298
		(5001-5017		Subtotal)	47,273	19,980	27,293	576
5018	5EB	50002	0	Ewaso Ngiro	27,092	21,623	5,469	176
				TOTAL	74,365	41,603	32,762	752
5019	5FA		0	Lagh Bisika	18,485			
5020	5FB		0	Lagh Bogal	8,171			
5021	5G		0	Lagh Katulo	25,958			
5022	5H	50180	0	Daua	6,784			
5023	5J				29,263			

APPENDIX B.5

Schematic Diagram of Drainage Area

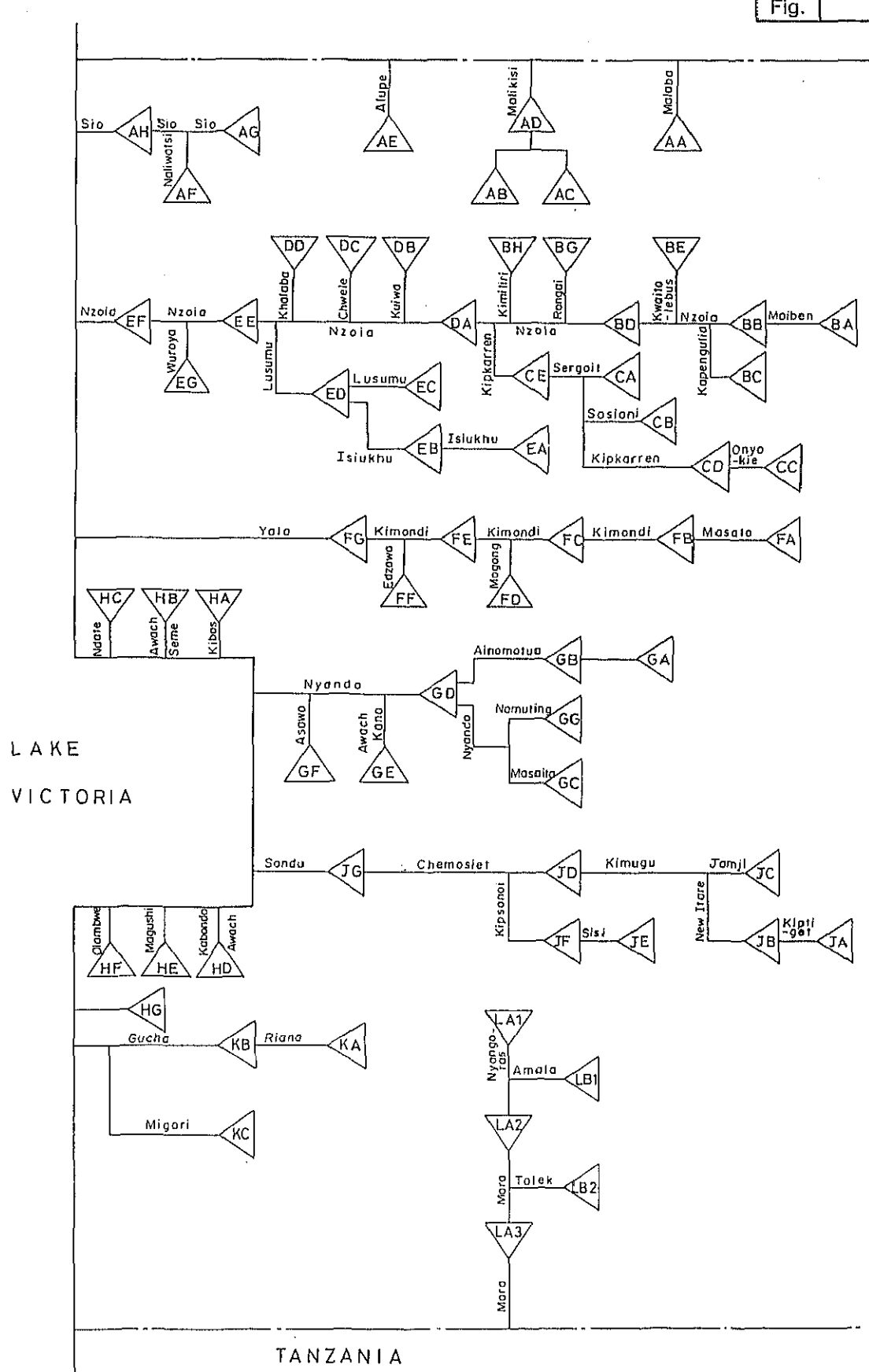


Figure B.5.1 Schematic Diagram of Sub-drainage Area (Drainage Area 1)

THE STUDY
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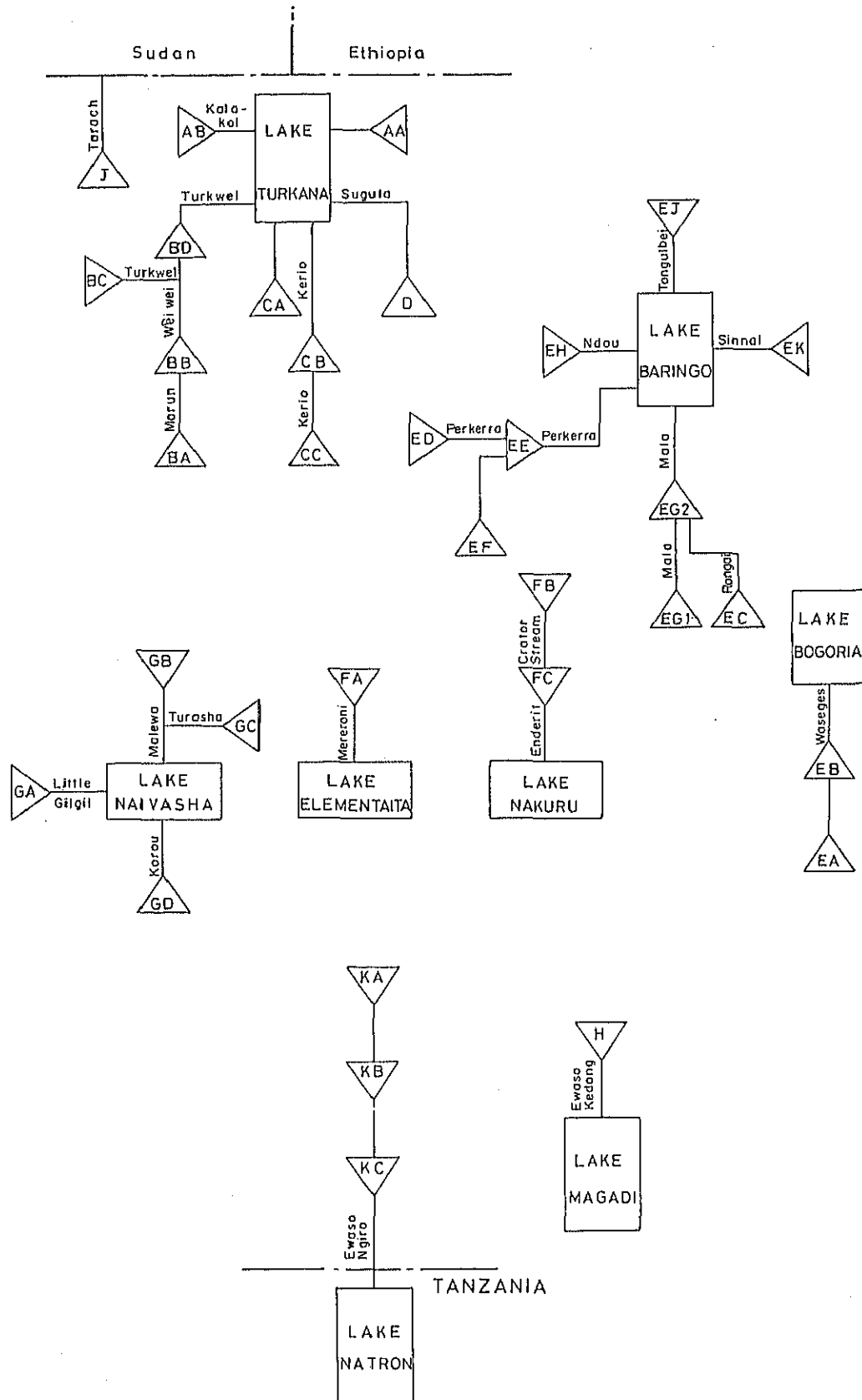


Figure B.5.2 Schematic Diagram of Sub-drainage Area (Drainage Area 2)

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THE NATIONAL WATER MASTER PLAN
JAPAN INTERNATIONAL COOPERATION AGENCY

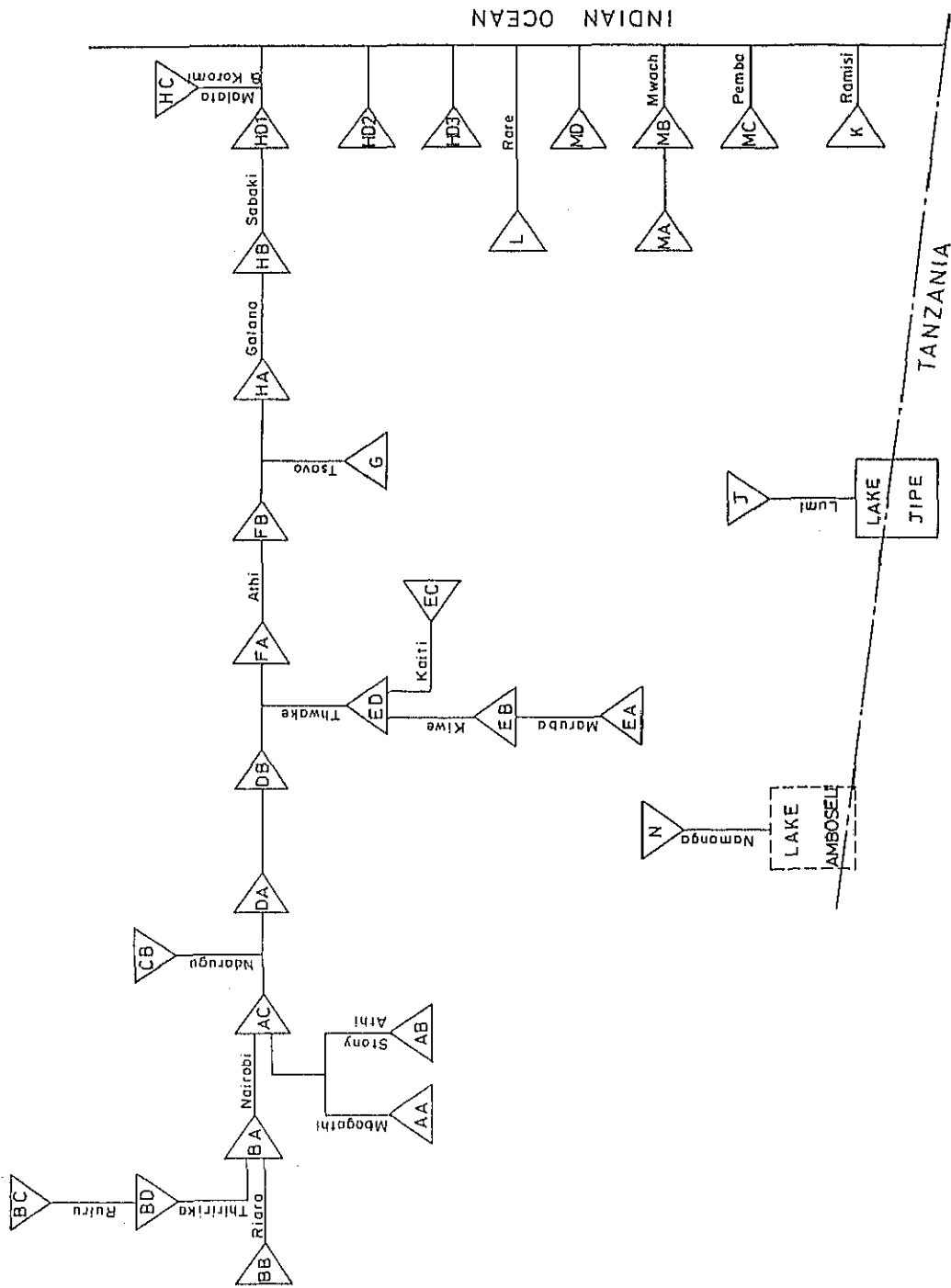


Figure B.5.3 Schematic Diagram of Sub-drainage Area (Drainage Area 3)

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JAPAN INTERNATIONAL COOPERATION AGENCY

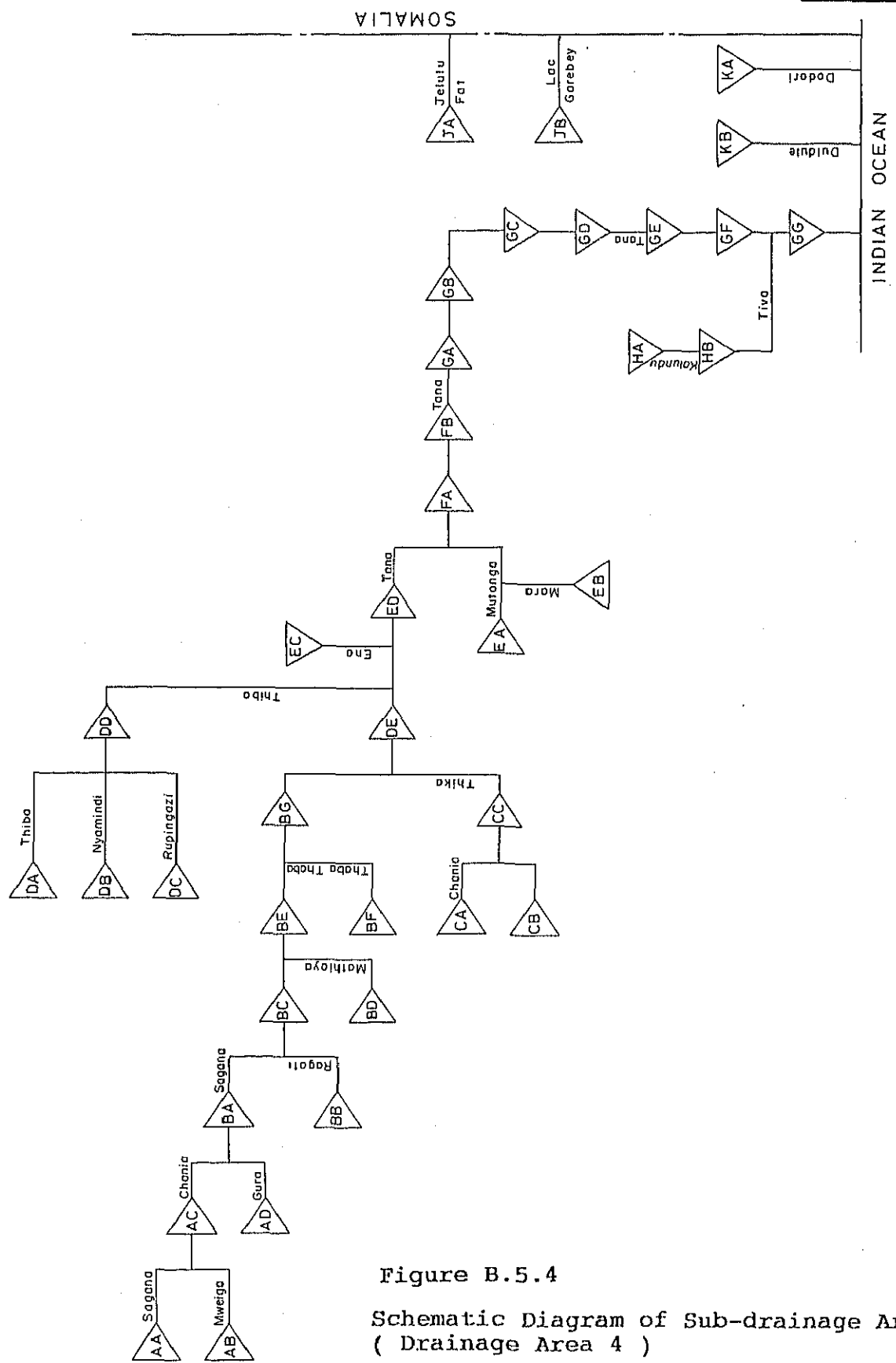


Figure B.5.4
Schematic Diagram of Sub-drainage Area
(Drainage Area 4)

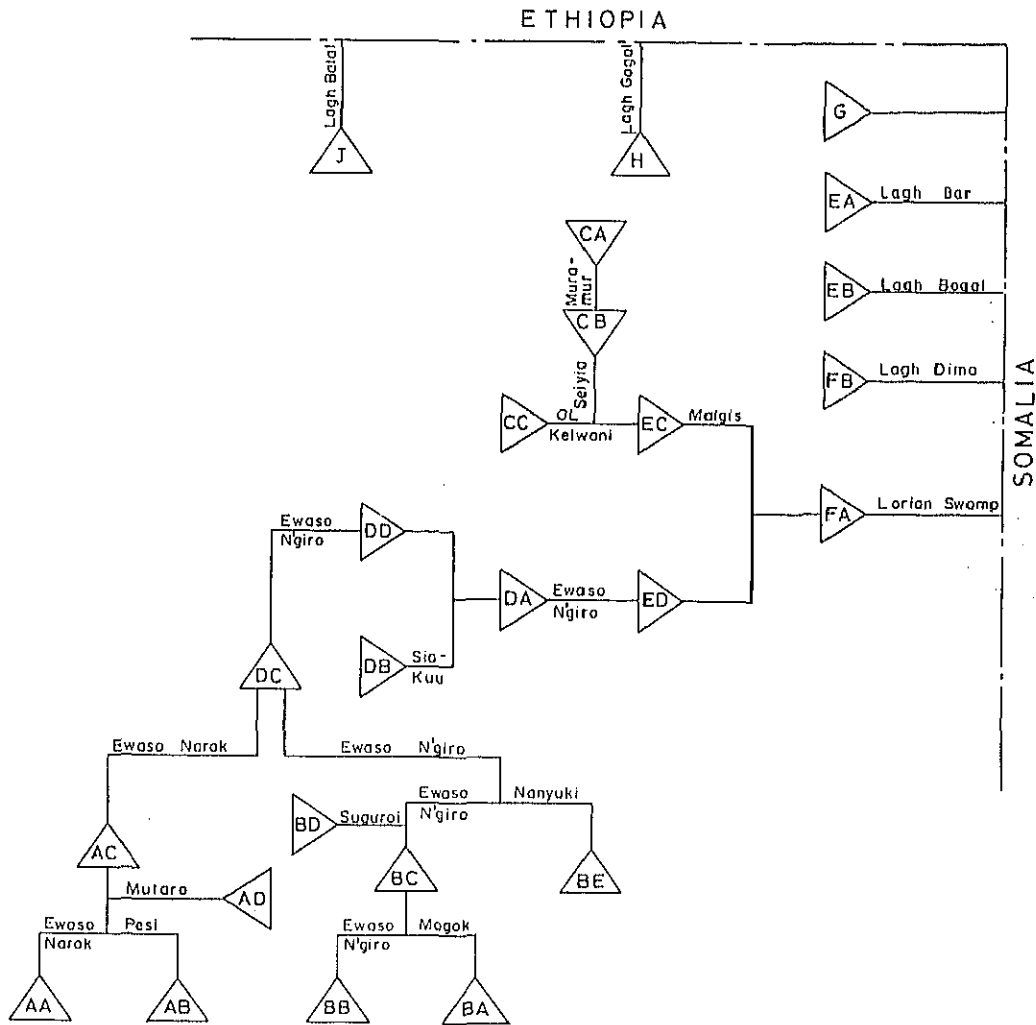


Figure B.5.5 Schematic Diagram of Sub-drainage Area (Drainage Area 5)

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