

TABLES

Table 1.1 Population by Tribe, Race and Nationality (1979 Census) (1/2)

Tribe or Nationality	Male	Female	Total
Kenyans			
Kikuyu	1,582,145	1,620,676	3,202,821
Embu	89,471	90,929	180,400
Meru	416,800	423,704	840,504
Mbere	29,242	32,483	61,725
Kamba	852,360	873,209	1,725,569
Tharaka	4,763	4,919	9,682
Luhya	1,048,914	1,070,794	2,119,708
Kisii	469,629	474,458	944,087
Kuria	46,388	42,781	89,169
Mijikenda	357,116	375,714	732,830
Pokomo	19,835	19,906	39,741
Taita	74,068	79,051	153,119
Taveta	3,850	3,826	7,676
Swahili/Shirazi	2,903	2,743	5,646
Bajun	18,304	18,667	36,971
Boni/Sanye	2,108	2,062	4,170
Luo	966,548	989,297	1,955,845
Kalenjin	820,749	831,494	1,652,243
Masai	120,838	120,557	241,395
Samburu	36,168	37,457	73,625
Turkana	106,009	101,240	207,249
Teso	66,192	66,295	123,487
Nderobo	3,698	3,502	7,200
Njemps	3,668	3,878	7,546
Rendille	10,940	10,854	21,794
Boran	35,306	33,588	68,894
Gabbra	15,467	15,086	30,553
Sakuye	926	893	1,824
Orma	16,134	15,993	32,127
Gosha	917	935	1,852
Hawiyah	811	793	1,604
Ogaden	13,584	12,058	25,642
Ajuran	11,309	10,697	22,006
Gurreh	41,901	41,182	83,083
Degodia	49,227	43,808	93,035
Somali (so stated)	83,119	72,575	155,695
Basuba	29,889	29,779	59,668
El Molo	277	261	538
Asian	17,402	15,152	32,554
European	2,200	2,245	4,445
Arab	9,486	9,375	18,861
Other Kenyans	29,711	27,708	57,318
Total Kenyans	7,510,372	7,632,528	15,142,900

Table 1.1 Population by Tribe, Race and Nationality (1979 Census) (2/2)

Tribe or Nationality	Male	Female	Total
Non-Kenyans			
Africans	39,744	32,074	71,818
Asians	23,755	22,291	46,046
Europeans	17,409	18,047	35,456
Arabs	10,562	9,723	20,285
Others	5,102	5,111	10,213
Total Non-Kenyans	96,572	87,246	183,818
Not stated	169	174	343
Total	7,607,113	7,719,948	15,327,061

Source: Statistical Abstract 1983.

Table 1.2 Population, Density, Growth Rates and Projections of Project Area

	Kenya	Western Province	Nyanza Province	Kisumu	Siaya	S.Nyanza	Kisii	Kericho, Rift Valley Province
Total Land Area (km ²)	571,416	8,223	12,526	2,093	2,523	5,714	2,196	4,890
Population (10 ³ persons) 1969 census	10,943	1,328	2,122	401	383	663	675	479
Population (10 ³ persons) 1979 census	15,327	1,833	2,644	482	475	818	870	633
Population Density per km ² 1979	27	223	211	230	188	143	395	161
Population Growth Rate % per annum	3.4	3.3	2.2	1.9	2.2	2.1	2.6	2.8
Projected Population 1985	20,241	2,355	3,632	655	651	1,120	1,206	816
Projected Population 1990	24,397	2,837	4,323	773	773	1,329	1,447	984
Projected Population 2000	34,792							

Source: Census 1969, Census 1974; CBS, Population Projections for Kenya 1980 - 2000, March, 1983.

Table 1.3 GDP by Sector at Current Prices
(1970, 1979 and 1983)

(Unit: 10^3 kL, % share in parentheses)

Sector	1970	1979	1983
Agriculture, forestry and fishery	173.0 (33.1)	679.0 (34.4)	1,091.6 (33.2)
Mining and quarrying	2.4 (0.5)	5.0 (0.3)	6.2 (0.2)
Manufacturing	62.2 (11.9)	249.8 (12.6)	408.3 (12.4)
Electricity and water	12.0 (2.3)	42.3 (2.2)	76.8 (2.3)
Construction	62.4 (5.1)	117.5 (5.9)	180.2 (5.5)
Wholesale and retail trade, hotels and restaurants	55.8 (10.7)	209.2 (10.6)	346.3 (10.5)
Transport & communications	40.8 (7.8)	114.7 (5.8)	195.3 (5.9)
Government services	76.5 (14.7)	290.3 (14.7)	481.4 (14.6)
Other services	72.8 (13.9)	267.2 (13.5)	505.2 (15.4)
Total GDP at factor cost	521.9	1,975.0	3,291.2

Sources: Statistical Abstracts 1970, 1979 and 1983

Table 1.4 Planted Area and Production of Selected Crops, Western Kenya (1982)

Province/District	Maize		Rice		Cotton		Sugarcane		Coffee	
	ha	10 ³ tons	ha	tons	ha	10 ³ tons	ha	10 ³ tons	ha	tons
Nyanza Province	206,841	531.9	982	1,085	45,721	5.6	40,344	1,370.7	8,385	3,055
Kisumu	13,000	29.3	283	401	7,200	2.0	30,750	1,045.4	75	3.1
Siaya	42,112	75.8	14	16	10,531	1.3	1,055	26.4	44	4.9
S. Nyanza	86,909	234.7	685	668	27,990	2.3	8,539	298.9	1,266	645
Kisii	64,820	192.1	-	-	-	-	-	-	7,000	2,402
Western Province	203,948	517.7	1,647	1,464	29,026	9.1	50,073	1,702.1	4,851	1,550
Bungoma	66,528	175.5	400	480	4,764	2.9	12,491	375.8	3,681	1,285
Kakamega	110,420	288.2	192	144	262	0.2	36,882	1,305.3	1,120	270
Busia	27,000	54.0	1,055	840	24,000	6.0	700	21.0	50	negligible
Western Kenya (Approx. share %)	410,789	1,049.6 (48)	2,629	2,549 (17)	74,747	14.7 (57)	90,417	3,072.8 (94)	13,236	4,610 (15)
Kenya (1983)		2,178 ^{3/}		36,600 ^{4/}		25.8 ^{4/}		3,285.6 ^{4/}		95,326 ^{4/}

Note: 1/ Rain-fed.

2/ Estimated based on assumed unit yield: 2 ton/ha for maize, 0.25 ton/ha for cotton, 30 ton/ha for sugarcane and 0.8 ton/ha for rain-fed rice.

3/ Estimated total production (based on "Crop Forecast Surveys").

4/ Sales to respective marketing boards

Sources: MOA, "Annual Report 1982, Nyanza Province"
 "District Development Plans 1984-88" for Western Province
 "Economic Survey 1984" for Kenya

Table 1.5 Quantity and Value of Fish Landed in Kenya, 1979-1983

	1979	1980	1981	1982	1983*
Quantities Tonnes:-					
Freshwater fish-					
Lake Victoria	30,592	26,914	38,179	60,958	70,820
Lake Turkana	13,731	12,384	10,529	11,040	7,860
Other areas	2,075	3,584	2,677	2,019	1,824
TOTAL	46,398	42,882	51,385	74,017	80,504
Marine fish	2,858	4,905	5,546	6,622	5,277
Crustaceans	256	400	384	426	246
Other marine products	801	31	37	68	80
GRAND TOTAL	50,313	48,218	57,352	81,133	86,107
Value KL'000:-					
Freshwater fish	3,708	3,959	6,362	8,447	9,623
Marine fish	625	156	1,486	2,046	1,699
Crustaceans	184	341	338	413	246
Other marine products	139	9	14	80	95
TOTAL	4,656	4,465	8,200	10,989	11,663

* Provisional.

Source: Economic Survey 1984

Table 1.6 Categories of Agricultural Land*/

(in 10³ Ha)

Province/District	Agricultural Land			All Other Land	Total Land Area
	High Potential	Medium Potential	Low Potential		
Central Province	909	15	41	353	1,318
Coast	373	796	5,663	1,472	8,304
Nairobi	16	-	38	14	68
North-Eastern Province	-	-	12,690	-	12,690
Rift Valley	3,025	123	12,220	1,515	16,883
Nyanza Province	1,218	34	-	-	1,252
Kisumu District					
Siaya	432	29	-	-	461
Kisii	220	-	-	-	220
South Nyanza "	566	5	-	-	571
Western Province	741	-	-	82	823
Bungoma District	253	-	-	55	308
Busia	163	-	-	-	163
Kakamega "	325	-	-	27	352
Western Kenya	1,959	34	-	82	2,075
Kenya	6,785	3,157	42,105	4,867	56,914

Note: */ The three categories are defined as follows:

High potential: annual rainfall of 857.5mm or more (over 980mm in Coast Province).

Medium potential: annual rainfall of 735mm-857.5mm. (735mm-980mm in Coast Province

and 612.5mm-857.5mm in Eastern Province).

Low potential: annual rainfall of 612.5mm or less.

Source: Statistical Abstract 1983

Table 2.1 Some Prospective Industrial Development Projects, including Electricity Intensive Ones in the Lake Basin Area (1/3)

1. Agro-processing and related industries

<u>Raw materials</u>		<u>Industries and products</u>	<u>Remarks</u>
Maize	Processing	Flour Starch* Oil	Maize mills planned in Kakamega and Migori
Cassave	Processing	Chips quality food Starch* glucose etc.	
Bamboos		Paper mill* Rayon plant Handicrafts	Production of 100 tons/day of more may be possible. (Presently 50,000 tons/year at Webuye)
Sugarcane	Molasses	Industrial alcohol Potable alcohol, perfume etc.	Once planned and abandoned, but deserve re-consideration; direct processing of sugarcane is another possibility
Sunflower Groundnuts Clustered seeds	Edible Oil	Solvent extractor, refinery* etc.	Edible oil plant planned in Kakamega
Fruits, vegetables, beans, cashewnuts, coconuts		Variety of processing (dehydration*, canning etc.)	Fruit processing planned in Kisii District; technology and other raw materials readily available
Others:		Paper and pulp from wood chips, water paper, papyrus reed etc.; Tannery and leather products (export-oriented), Sanitary products from cotton (import-substitution); Large slaughterhouse for total processing; Charcoal briguettes from wood chips and sawdusts	

Table 2.1 Some Prospective Industrial Development Projects, including Electricity
Intensive Ones in the Lake Basin Area (2/3)

2. Aqua-processing and ancillary industries

Fish processing	low quality	Fish meal plant
	high quality	Fish filleting (Planned in Homa Bay; marketing may be more difficult than for fish meal)
	wastes etc.	Fish oil Inputs to other industries
		Fertilizer/manure (Wastes from slaughterhouses may also be used)

Ancillary industries:

- Ice plants*
 - Cold stores*
 - Fishing boat industry wood, steel or glass fiber hulls*
 - Fishing gears industry
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Table 2.1 Some Prospective Industrial Development Projects, including Electricity Intensive Ones in the Lake Basin Area (3/3)

3. Other industries based on mineral resources

<u>Raw materials</u>	<u>Industries/products</u>	<u>Remarks</u>
Clay etc.	Ceramics* Bricks and tiles	Planned in Kisii Dist. and Kisumu; additives for ceramics also available
Limestone, marl, clay etc.	Cement plant	One proposed in Koru; F/S done with mixed results; lime plant can be easily established
Apatite (phosphorous)	Fertilizer	
Pyrite (iron sulphides)	Sulfuric acid	
Soapstones	Building materials (ornamental tiles etc.) Filler for paper, insecticide, rubber and paint Base materials for ceramics	
Manganese	Battery ingredient	Currently used
Iron ore, coal etc.	Steel mill*	Long-term prospect with high quality iron ore (- 60%) from Uganda and coal from Tanzania; also possibility of iron deposits in Western Kenya
Gold ore	Gold	Many small-scale operations in the past

Other mineral resources of varying potentials:

Copper, cobalt and base metals, radio-active, rare earth and niobium minerals, graphite, tin, and diamond

Notes: Electricity-intensive projects are marked with asterisk(*).

Sources: JICA Study Team

Table 2.2 Rough Estimates of Power Requirements for Prospective Industries in Lake Basin Area (1/2)

Industry	Raw Material Availability	Development Scale	Power Requirements	Notes	Number of plants that may be established in Next 10 years
1) Bricks and tiles	Widespread abundant	50,000 tiles/day in combination with small brick plants (60,000 bricks/day)	200 kW 600,000 kWh/year	Other important requirements: water 1.40, fuel 1.10 per product ton	2 - 3
2) Ceramics		1,000 tons/year ± 65,000 pieces	600 kW		1
3) Wood products (quality furniture etc.)	From forests in Mt. Elgon and West of Nakuru		100 kW		1 - 2
4) Tannery	At least 1.2 million pieces/year	30,000 hydres/year	300 kW	Other important requirements: large quantity of water, fuel for boiler and drying	3
5) Edible oil	Up to 40,000 tons/year	100 tons/day, 20,000 tons/year	1,000 kW	Including oil extraction, refining and meal treatment	1 - 2
6) Maize milling	Up to 500,000 tons/year	50 tons/day 15,000 tons/year	100 kW		3 - 5
7) Fish processing	Up to 60,000 tons/year	20 tons/day 4,000 tons/year	150 kW	Including ice-making and cold storage	5 - 8

Table 2.2 Rough Estimates of Power Requirements for Prospective Industries in Lake Basin Area (2/2)

Industry	Raw Material Availability	Development Scale	Power Requirements	Notes	Number of plants that may be established in Next 10 years
8) Cement	15,000 tons of lime and marl at Koru	400,000 tons/year	3,500 kW 20,000,000 kWh/year		1
<u>A remote possibility</u>					
9) Steel		250,000 tons/year	100 MW 250 GWh/year	Direct reduction process has to be used due to unavailability of coal	
- Estimated total power requirement for industries (1) through (8) is calculated to be about 9,000 kW.					
- Including other minor industries, power demand in the region may be about 11 - 13 MW in mid-1990's for new industries alone.					
- The following were referred to in preparing this list, which should be regarded only as a preliminary one.					
1) Feasibility Study for Bricks and Tiles Factory Project, Draft Final Report, August 1984, Viginter, Italy; Project Profile, Ministry of Commerce and Industry.					
2) Ceramic Sanitary Ware Project, May 1977, Min. of Commerce and Industry.					
3) Proposal for Quality Furniture Factory at K.I.E. Kisumu, September 1982, Nzoia River Furniture Ltd.					
4) Tannery Project for Lake Basin Area, October 1983; Project Profile, Min. of Commerce and Industry.					
5) Feasibility Study Report on Vegetable Oil Manufacturing Plant in Republic of Kenya, March 1983, J.C.I.					
6) Area Development Study, Rural Industrial Development Programme, Bungoma District, Min. of Commerce and Industry.					
7) Kenya Fisheries Project, Staff Appraisal Report, May 1980, World Bank; K.I.E., Kisumu.					

Table 3.1 Population and Population Density of Sondu-basin (1979)

Sub-basin	Population	Land Area(km2)	Density
1. Upper Itare	39,500	746	52.96
2. Lower Itare	32,085	256	125.41
3. Kitoi	54,438	411	132.51
4. Kabianga	49,061	222	221.12
5. Sisei	87,346	581	150.43
6. Kipsonoi	169,243	1,052	161.25
7. Upper Sondu	13,600	39	352.87
8. Lower Sondu	55,261	206	267.93
9. Miriu/Sondu Delta	10,018	90	811.13
Total	510,553	3,601	141.86

Source: Integrated Land Use Survey 1983 LBDA

Table 3.2 Population and Annual Growth Rates of the Sondu Basin

Sub-basin	Population			Annual Growth Rates(%)	
	1962	1969	1979	1962-1969	1969-1979
1. Upper Itare	32,287	28,804	39,500	-1.62	3.21
2. Lower Itare	22,181	31,888	32,085	5.33	0.06
3. Kitoi	38,802	42,105	54,438	1.18	2.60
4. Kabianga	27,340	36,100	49,061	4.05	3.12
5. Sisei	48,311	62,128	87,346	3.66	3.47
6. Kipsonoi	117,264	123,166	169,243	0.70	3.23
7. Upper Sondu	9,578	9,435	13,600	-0.22	3.72
8. Lower Sondu	33,404	42,842	55,261	3.62	2.58
9. Miriu/Sondu Delta	11,135	16,890	10,018	6.14	-5.09
Total	340,302	393,357	510,553	2.09	2.64

Source; Integrated Land Use Survey 1983 LBDA

Table 3.3 Land Use of the Sondu Basin

	(Unit: ha)								
	Upper Itare	Lower Itare	Kitoi Kabianga	Sisei	Kipsoni	Upper Sondu	Lower Sondu	Sondu/Miriu Delta	Sondu Basin
Total Agriculture	19,825	11,300	16,025	16,083	29,936	56,761	9,788	2,507	164,792
Active Cultivation	9,538	7,773	13,045	8,257	13,137	26,806	6,209	1,244	87,531
Cash Crops	3,033	5,888	9,620	1,861	1,448	9,024	884	26	32,078
Staple Crops	4,817	1,343	2,687	5,411	4,008	8,821	2,857	821	31,370
Vegetables/Fruits	218	135	401	241	249	736	136	0	2,180
Other/Unidentified	660	73	231	129	520	1,622	194	343	3,823
Field Borders	178	237	435	109	317	740	28	0	2,057
Fallow Fields	3,614	248	224	311	1,844	3,260	2,582	1,263	13,789
Managed Pasture	6,496	3,043	2,320	7,406	14,638	25,955	969	0	61,415
Total Infrastructure	1,535	1,263	1,829	1,900	4,403	6,517	2,528	919	21,378
Transport Network	716	459	1,122	499	1,744	2,063	611	244	7,548
Homestead Land	521	452	543	578	1,132	1,719	873	283	6,300
Hedges	350	389	255	852	1,579	2,835	1,094	403	7,957
Total Natural Vegetation	52,327	12,985	23,172	4,099	23,593	40,997	8,140	5,243	171,358
Tree Canopy	24,267	9,719	15,453	1,485	5,521	18,713	1,594	357	77,349
Bush Canopy	14,768	656	4,149	272	1,621	6,109	2,077	1,232	31,087
Herbaceous Cover	13,292	2,611	3,570	2,342	16,452	16,176	4,469	3,654	62,922
Miscellaneous	896	35	58	105	130	684	170	289	2,367
Total	74,583	25,583	41,084	22,187	58,062	104,959	20,626	8,958	359,895

Source: Integrated Land use Survey 1983 LBDA

Table 3.4 Agriculture Land Use (Identified Crops) of the Sondu Basin (1/2)

	(Unit: ha)									
	Upper Itare	Lower Itare	Kitoi	Kabianga	Sisei	Kipsonoi	Upper Sondu	Lower Sondu	Sondu Miriu Delta	Sondu Basin
Arrowroot	0	0	0	0	0	0	0	0	0	0
Banana	8	6	8	60	92	198	107	863	8	1,349
Beans and Pulses	0	31	0	0	53	25	0	179	0	287
Cabbages	82	0	41	15	17	26	0	0	0	181
Cassava	0	0	0	0	0	0	0	216	628	845
Citrus	0	1	0	7	1	10	0	0	0	19
Coffee	258	0	0	0	4	30	95	473	0	860
Cotton	0	0	0	0	0	0	0	0	7	7
Finger Millet	0	0	0	0	76	6	20	20	0	123
Fodder Grass	16	9	1	41	67	417	0	15	0	566
Groundnuts	0	0	0	0	0	0	0	0	0	0
Horticulture	56	66	87	93	103	402	8	34	0	849
Irish Potato	83	8	0	6	3	83	0	0	0	184
Maize & Sorghum	4,722	1,295	2,679	5,300	3,606	8,290	356	901	138	27,287
Onions	0	0	0	0	0	0	0	0	0	0
Passion Fruit	0	0	0	0	0	0	0	0	0	0
Pawpaw	0	0	0	0	0	0	0	0	0	0
Pineapple	0	0	0	0	0	0	3	235	12	250
Pumpkins & Gourd	0	0	0	3	1	3	0	0	0	6
Pyrethrum	385	4	3	0	144	210	5	0	0	751
Rice (Irrigated)	0	0	0	0	0	0	0	0	0	0
Sisal	0	0	0	0	0	0	0	0	0	0
Spider Flower	0	0	0	0	0	0	0	0	0	0
Sugarcane	1	6	5	26	60	186	5	76	8	373
Sukumawiki	79	63	273	125	127	295	56	102	0	1,119
Sunflower	0	0	0	0	0	0	0	0	0	0
Sweet Potato	5	3	0	45	178	220	120	678	47	1,295

Table 3.4 Agriculture Land Use (Identified Crops) of the Sondu Basin (2/2)

	(Unit: ha)									
	Upper Itare	Lower Itare	Kitoi	Kabianga	Sisei	Kipsonoi	Upper Sondu	Lower Sondu	Sondu Miriu Delta	Sondu Basin
Tea (Estate)	214	4,941	9,057	720	0	3,374	0	0	0	18,307
Tea (Small Holder)	1,124	937	554	1,115	1,239	2,300	186	100	0	7,556
Thatch Grass	0	0	0	17	27	0	0	19	0	63
Tobacco	0	0	0	0	0	0	0	0	0	0
Tomatoes	0	5	0	0	0	0	0	0	0	5
Wheat/Barley/Oats	1,051	0	0	0	0	2,925	0	0	0	3,976
Total	8,084	7,375	12,709	7,571	5,799	18,999	962	3,911	848	66,257

Source: Integrated Land Use Survey 1983 LBDA

Table 3.5 Livestock Production of the Sondu Basin

	Upper Itare	Lower Itare	Kitoi	Kabianga	Sisei	Kipsoni	Upper Sondu	Lower Sondu	Sondu/ Miriu Delta	Sondu Basin
Grade Cattle	23,567	11,514	4,391	20,690	43,229	81,016	1,208	1,779	0	187,392
Local Cattle	4,768	2,679	1,344	5,870	50,753	22,001	1,490	15,842	4,569	109,316
Sheep and Goats	11,327	4,124	5,250	2,652	19,404	24,666	550	4,748	3,060	75,782
Donkeys	152	14	88	250	303	571	0	118	78	1,573
Livestock Units	28,433	13,880	6,091	25,015	79,266	99,274	2,259	12,841	3,464	270,523
Density (per Km ²)	38.12	54.25	14.83	112.75	136.52	94.58	58.60	62.26	38.67	75.17

Source: Integrated Land Use Survey 1983 LEDA

Table 3.6 Service Center of the Sondu Basin

District	Urban Center	Rural Center	Market Center
Kisumu		Sondu	
Kericho	Kericho Sotik	Sosiot Litein Roret	Kapkatet Kipsonoi Kapkoros Chemosit Magwagwa Ikongel Nyansiongo Mikomoni
Kisii			

Source: Integrated Land Use Survey 1983 LBDA

Table 3.7 Out-Patient Morbidity (1980) (1/2)

Diseases	Kisumu				Total	%
	1st	2nd	3rd	4th		
Diarrhoea Diseases	31,878	40,019	33,722	28,442	134,061	8.4
Tuberculosis	57	52	71	79	259	0.0
Leprosy	66	58	103	106	333	0.0
Whooping Cough	1,561	1,795	1,077	638	5,071	0.3
Meningitis	98	72	84	159	413	0.0
Tetanus	29	20	36	13	98	0.0
Acute Poliomyelitis	64	20	9	129	222	0.0
Chicken Pox	572	235	193	200	1,200	0.1
Measles	3,118	4,065	5,415	4,102	16,700	1.0
Infectious Hepatitis	177	193	253	247	870	0.1
Mumps	359	279	529	3,958	5,125	0.3
Malaria	124,638	148,493	137,165	116,061	526,357	32.9
Conorrhoea	7,020	7,252	8,758	7,866	30,840	1.9
Bilharzia (Schistosomiasis)	1,353	569	758	702	3,382	0.2
Intestinal Worms	14,354	15,240	15,051	13,565	58,210	3.6
Malnutrition	3,858	3,513	3,690	3,360	14,421	0.9
Anaemia	3,864	3,162	3,803	3,067	13,896	0.9
Acute Eye Infections	7,638	8,481	7,732	7,949	31,800	2.0
Cataract	258	331	227	280	1,096	0.1
Ear Infections	5,776	5,202	5,968	5,682	22,628	1.4
Heart Diseases	134	149	101	123	507	0.0
Acute Respiratory Infections	62,366	78,906	71,711	59,683	273,383	17.1
Pneumonia	2,160	2,995	2,838	5,171	13,154	0.8
Abortions	1,097	771	1,135	897	3,900	0.2
Puerperal Sepsis	440	607	511	286	1,844	0.1
Diseases of the skin (incl. Ulcers)	18,285	14,300	16,698	16,612	65,895	4.1
Rheumatism, Joint Pains etc.	7,219	5,961	6,069	7,060	26,309	1.6
Pyrexia of unknown origin (Puo)	7,824	9,333	8,937	6,575	32,669	2.0
Accidents (incl. fractures, burns)	5,302	5,781	6,057	6,823	23,963	1.5
All other Diseases	56,383	68,007	67,995	98,234	290,619	18.2
Total new cases	367,948	425,861	406,640	398,069	1,598,518	100.0
Reattendances	140,592	136,883	116,076	126,597	520,148	32.5
Referrals	3,880	5,311	6,182	8,820	24,193	1.5

Source: Health Information Bulletin 1981 - 1983, Ministry of Health

Table 3.7 Out-Patient Morbidity (1980) (2/2)

Diseases	South Nyanza				Total	%
	1st	2nd	3rd	4th		
Diarrhoea Diseases	31,634	35,093	30,402	28,236	125,365	8.7
Tuberculosis	6	25	29	28	88	0.0
Leprosy	24	51	65	113	253	0.0
Whooping Cough	1,143	979	837	1,048	4,007	0.3
Meningitis	11	20	37	82	150	0.0
Tetanus	28	8	29	33	98	0.0
Acute Poliomyelitis	8	13	91	80	192	0.0
Chicken Pox	437	451	376	356	1,620	0.1
Measles	2,584	2,729	3,286	3,338	11,937	0.8
Infectious Hepatitis	554	287	337	452	1,630	0.1
Mumps	355	396	348	318	1,417	0.1
Malaria	120,110	136,367	135,238	113,307	505,022	34.8
Gonorrhoea	7,394	7,080	7,340	6,247	28,061	1.9
Bilharzia (Schistosomiasis)	1,748	1,615	1,604	1,338	6,305	0.4
Intestinal Worms	24,154	23,547	28,036	21,959	97,697	6.7
Malnutrition	2,724	2,729	3,056	2,083	10,092	0.7
Anaemia	4,921	4,221	4,707	4,622	18,471	1.3
Acute Eye Infections	10,712	9,964	11,188	9,413	41,277	2.8
Cataract	187	130	271	304	892	0.1
Ear Infections	6,431	6,732	7,992	7,430	28,585	2.0
Heart Diseases	96	104	152	206	558	0.0
Acute Respiratory Infections	43,884	47,247	53,276	41,132	186,139	12.8
Pneumonia	1,623	1,291	1,959	1,936	6,809	0.5
Abortions	1,035	826	760	926	3,547	0.2
Puerperal Sepsis	578	639	518	516	2,251	0.2
Diseases of the skin (incl. Ulcers)	19,146	18,149	17,506	13,669	68,470	4.7
Rheumatism, Joint Pains etc.	8,387	5,957	7,313	7,130	28,787	2.0
Pyrexia of unknown origin (Puo)	9,257	8,818	6,293	5,204	29,572	2.0
Accidents (incl. fractures, burns)	5,813	5,399	5,361	5,223	21,796	1.5
All other Diseases	52,255	58,855	55,897	51,131	218,138	15.1
Total new cases	357,241	379,218	384,304	328,460	1,449,223	100.0
Retattendances	118,541	128,414	135,041	119,635	501,631	34.6
Referrals	2,164	1,654	1,952	1,992	7,762	0.5

Source: Health Information Bulletin 1981 - 1983, Ministry of Health

Table 3.8 Distribution of Malaria in Kenya

Classification /Degree	Spleen Rate Age 2.9	Area
(1) Endemic		
(a) holoendemic	> 75%	Coast Province, coastal area; Tana River, Kano Plains, Taveta.
(b) hyperendemic	50-74%	North Nyanza, Bungoma, Busia, Simba Hills.
(c) mesoendemic	10-49%	Machakos, Kitui, Thika; parts of North Nyanza, Murang'a and Embu below 1,300m
(d) hypoendemic	< 10%	Meru, Pokot, Samburu, Isiolo, Baringo
(2) Epidemic	Variable	Highland over 1,600m with high rainfall and dry areas with exceptional rainfall: Masailand, Nandi, Kericho, Kisii, NFD, Eastern Kitui, Londiani, Elgeyo
(3) No transmission (sometimes anophelism without malaria)	None	At altitude over 2,000m: Aberdares, M. Kenya, M. Elgon (forest, moorland, plateaux)

Source; Health and Disease in Kenya 1974

Table 3.9 Out-patient Morbidity and Schistosomiasis (1980)

Diseases	Quarter	(Case Rate per 100,000)				
		Kisumu	South Nyanza	Nyanza Province	Western Province	Rift Vally Province
Malaria	1st	24,026	14,432	15,852	12,200	5,107
	2nd	30,368	16,385	17,536	15,493	5,832
	3rd	27,936	16,196	18,033	13,842	8,105
	4th	23,638	13,570	16,089	8,507	6,177
Bilharzia (Schisto- somiasis)	1st	261	210	154	30	43
	2nd	116	194	110	19	27
	3rd	154	192	106	10	109
	4th	143	160	91	11	42
Total Net Cases	1st	70,927	42,926	51,555	38,524	43,716
	2nd	82,090	45,567	54,842	40,724	42,211
	3rd	82,819	46,024	55,882	37,877	47,841
	4th	81,073	39,337	53,510	31,158	44,501

Source; Health Information Bulletin 1981-1983, Ministry of Health

Table 3.10 A. Gambiae Females Collected Indoors near Kisumu

Collection Place	No. Houses Surveyed	A. Gambiae Females per House	Identifications	
			Species A	Species B
Lakeshore				
1. Amimos	3	0.3	0	1
2. kusa	4	3.5	1	5
3. Nanga	6	0.2	0	1
4. Rifle Range	10	0.1	0	1
Sub-total	23	1.0	1	8
Valley				
(non-irrigated areas)				
5. Chiga	24	9.5	1	166(7)
6. Masogo	7	0.1	1	0
7. Nyalenda	4	1.5	1	3
8. Nyalunya	8	0.3	0	2
9. Oguodo	4	7.3	0	10
10. Rabuor	16	2.9	0	16
11. Waombo	3	1.0	0	1
Sub-total	66	3.2	3	198
(irrigated areas)				
12. Ahero	6	90.0	0	64(5)
13. Rae	5	52.0	0	110(6)
Sub-total	11	71.0	0	174
Foothills				
14. Awasi	4	5.7	3	9
15. Chemase	4	1.4	2	0
16. Chemelil	4	2.3	4	4
17. Kanyamedha	20	2.3	18(2)	0
18. Kapsarok	4	2.0	2	3
19. Nyagbongo	12	0.1	1	0
20. Obambo	3	3.5	3	1
21. Obwolo	2	0	0	0
22. Ongalo	3	4.0	3	0
23. Paponditi	3	0	0	0
24. Tiengre	2	9.5	5	7
Sub-total	61	2.8	41	24
Highland				
25. Darajambili	4	15.0	16(2)	1(1)
26. Kiboswa	4	0	0	0
27. Onywongo	8	3.3	11	0
28. Sondu	8	0	0	0
Sub-total	24	4.6	27	1
Total	169	7.8	72(4)	405(19)
and Unweighted Mean				

Source: East African Institute of Malaria and Vector - Borne Diseases, January - December 1970

Table 3.11 Annual Rainfall of the Sondu Basin

Rainfall	Percentage
- 800 mm	0.0
800 - 900 mm	0.0
900 - 1000 mm	0.5
1000 - 1200 mm	3.9
1200 - 1400 mm	28.3
1400 - 1600 mm	23.8
1600 - 1800 mm	25.4
1800 - 2000 mm	18.0
2000 - mm	0.0

Source: Integrated Land Use Survey 1983 LBDA

Table 3.12 Monthly and Annual Rainfall at Typical Stations

Month	Kisumu (mm)	Kericho (mm)	Kisii (mm)
January	52.97	79.28	60.10
February	84.55	95.05	93.67
March	138.53	165.90	182.95
April	185.80	247.53	256.02
May	145.55	223.60	137.90
June	75.05	113.53	102.17
August	73.15	139.05	150.70
September	60.10	118.50	160.87
October	53.40	112.62	145.22
November	91.45	117.42	145.50
December	95.70	109.78	117.42
Annual	1093.20	1658.78	1762.42

Source: Natural Resources and the Development of Lake Victoria Basin of Kenya

Table 3.13 Water Quality Analysis of Sondu River

Chemical Property	Unit	Sondu Bridge	Miriu	Gari	Damsite
Sampling Time		10:15	11:10	12:15	13:05
Sampling Date		15/11/84	15/11/84	15/11/84	15/11/84
Atmospheric Temperature	°C	21	25		
Stream Temperature	°C	20	21	22	
PH		7.1	6.9	7.0	7.5
Dissolved Oxygen	mg/l	8.0	8.7	81.5	9.0
Nitrate - N	mg/l	1.5			1.2
Ammonia _ N	mg/l	0.7			NO
Turbidity	NTU	69			33
Alkalinity	mg/l	22			24
Hardness	mg/l	114			91
Chlorides	mg/l	< 0.8			< 0.8
Conductivity	mhos/cm	46	48	48	48

Source: Study Results by LBDA Staff

Table 3.14 Cover Area of Tree, Bush and Herbaceous in Sondu Basin

Sub-basin	Tree cover		Bush cover		Herbaceous cover		Total	
	area(ha)	ratio	area(ha)	ratio	area(ha)	ratio	area(ha)	ratio
Upper Itare	24,267	32.54	14,768	19.80	13,292	17.82	52,327	70.16
Lower Itare	9,719	37.99	656	2.56	2,611	10.20	12,986	50.75
Kitoi	15,453	37.61	4,149	10.10	3,570	8.69	23,172	56.40
Kabianga	1,485	6.69	272	1.22	2,342	10.56	4,099	18.47
Sisei	5,521	9.51	1,621	2.79	16,452	28.34	23,594	40.64
Kipsonoi	18,713	17.83	6,109	5.82	16,176	15.41	40,998	39.06
Upper Sondu	242	6.28	203	5.27	356	9.24	801	20.79
Lower Sondu	1,594	7.73	2,077	10.07	4,469	21.67	8,140	39.47
Sondu Delta	357	3.98	1,232	13.75	3,654	40.79	5,243	58.52
Sondu Basin	77,349	21.49	31,087	8.64	62,922	17.48	171,358	47.61

Source: Integrated Land Use Survey 1983 LBDA

Table 3.15 Natural Vegetation in Sondu Basin (1/2)

	Upper Itare	Lower Itare	Kitoi	Kablanga	Sisei	Kipsonoi	Upper Sondu	Lower Sondu	Sondu/Miriu Delta	Sondu Basin
Continuous Tree Canopy	20,074	9,329	13,619	1,049	1,758	14,780	147	862	191	61,809
Indigenous Forest	16,598	7,590	10,783	0	596	10,273	0	67	0	45,906
Riparian Strips	1,964	262	237	398	432	1,521	32	317	186	5,348
Plantation Forest	820	1,055	2,022	0	0	1,356	0	0	0	5,253
Woodlots	300	286	392	251	273	740	111	294	0	2,647
Windrows	391	136	186	400	457	891	5	185	5	2,655
Bush Thicket	17,704	794	4,840	260	869	6,126	9	1,242	858	32,701
Bush Canopy	13,585	492	3,661	184	615	4,439	9	995	656	24,637
Herbaceous Cover	1,035	221	312	63	89	706	0	154	123	2,702
Scattered Tree Canopy	2,613	26	754	13	49	776	0	21	52	4,304
Isolated Tree Canopy	471	54	112	0	116	206	0	71	27	1,059
Dense Bush	850	157	612	63	573	1,394	375	1,686	515	6,225
Bush Canopy	462	45	260	34	236	863	172	753	407	3,232
Herbaceous Cover	352	87	326	29	262	458	180	773	103	2,570
Scattered Cover	0	20	0	0	30	0	0	133	0	182
Isolated Trees	35	6	26	0	45	74	23	27	5	241
Light Bush	1,139	106	906	87	1,221	1,047	44	720	108	5,377
Bush Canopy	466	88	218	21	357	350	16	265	54	1,834
Herbaceous Cover	615	18	658	61	831	636	28	433	54	3,334
Scattered Tree Canopy	26	0	0	0	0	0	0	16	0	42
Isolated Trees	32	0	30	5	33	61	0	6	0	167
Scattered Bush	1,507	343	90	225	2,612	3,071	114	564	456	8,981
Bushy Canopy	255	31	11	32	412	458	7	63	115	1,384
Herbaceous Cover	1,161	305	79	175	2,054	2,532	105	488	340	7,239
Scattered Tree Canopy	63	0	0	6	70	14	0	0	0	152
Isolated Trees	29	6	0	12	75	68	2	13	1	206
Open Woodland	335	70	0	0	5,043	1,599	0	269	0	7,315
Herbaceous Cover	194	35	0	0	3,580	761	0	91	0	4,662
Tree Canopy	140	35	0	0	1,463	838	0	178	0	2,653

Table 3.15 Natural Vegetation in Sondu Basin (2/2)

	Upper Itare	Lower Itare	Kitoi	Kabianga	Sisei	Kipsonoi	Upper Sondu	Lower Sondu	Sondu/Miriu Delta	Sondu Basin
Open Grassland	9,660	1,726	2,326	1,264	9,948	10,643	45	2,537	2,038	40,186
Herbaceous Cover	9,495	1,698	2,195	1,218	9,466	10,340	42	2,530	2,028	39,012
Isolated Tree Canopy	165	28	131	46	482	302	3	7	10	1,174
Marshland	440	247	0	797	170	743	0	0	1,007	3,403
Papyrus	0	0	0	0	0	0	0	0	729	729
Undifferentiated	440	247	0	797	170	743	0	0	278	2,675
Other Vegetation	90	5	496	0	322	123	0	0	0	1,036
Scattered Trees in Cropland	439	143	182	275	879	1,156	49	191	47	3,361
Isol. Trees around H'steads	53	37	92	29	51	100	6	49	11	428
Isolated Wayside Trees	37	29	10	52	147	216	11	21	13	536
Total	52,327	12,985	23,172	4,099	23,593	40,997	801	8,140	5,243	171,358

Source: Integrated Land Use Survey 1983 LBDA

Table 3.16 Fishes Found within the LBDA Region

Order	Family	Some Representative Genera and Species	English	LUO	SAMIA	
1. Lepidosireniiformes	Lepidosirenidae	Protopterus aethiopicus	Lungfish	Kamongo	Emonyé	
2. Cyprinodontiformes	Cyprinodontidae	Aplocheilichthys pumilus	guppies	-	-	
3. Perciformes	Mastacembelidae	Mastacembelus frenatus	Spiny eel	Okunaga	-	
	Anabantidae	Citenopoma muriei	-	-	-	
	Centropomidae	Lates niloticus	Nile perch	Mbuta	Embuta	
	Cichlidae	Tilapia spp.	Tilapia	Ngege	Ngege	Engege
		Haplochromis	Haplochromis	Haplochromis	Fulu	Efulu
4. Mormyriiformes	Mormyridae	Mormyrus kanuume	Elephant snout fish	Suma	Esurubana	
5. Cypriniformes	Cyprinidae	Gnathonemus longibarabis	-	obubu or ondhuri	-	
		Barbus altianalis	-	Ohhadho or fwani	Echachu	
	Schilbeidae	Labeo victorinus	-	Ningu	Eningu	
		Barbus apleurogramma	-	Adel	-	
		Engraulicypris argenteus	-	Omena	Omena	
Mochokidae	Schilbe mystus	Buttern fish	Sire	Esire		
	Synodontis victorinae	-	Okoko	Esidonge		
	Alestes jacksoni	-	Osoga	-		
	Clarias mossambicus	cat-fish	mumi	-		
Bagridae	Bagrus docmac	cat-fish	seu	-		

Source: Fisheries Development in the Lake Basin Region by A.P. Achleng 1984 LBDA

Table 3.17 Total Annual Production and Value of Fish Caught in the Kenya Waters of Lake Victoria

Years	Annual Production in Tonnes	Value in Kenya Shillings
1968	16,357	15,167,000
1969	17,442	16,047,000
1970	16,400	15,482,000
1971	14,918	15,333,000
1972	15,980	16,825,000
1973	16,797	18,127,000
1974	17,175	21,007,000
1975	16,581	21,308,000
1976	18,680	24,050,000
1977	19,332	25,681,000
1978	23,856	36,980,000
1979	30,592	48,897,000
1980	26,914	56,737,000
1981	45,667	102,511,000
1982	60,958	123,400,000
1983	77,328	120,315,000

Source: Ministry of Environment & Natural Resources
West Kenya Annual Report

Table 3.18 Annual Catches in Lake Victoria Tonnes

Years	Engraulicypris	Haplochromis	Burgus	Clarias	Protopterus	Tilapia	Labeo	Lates
1968	732	3,743	1,147	1,737	2,802	2,419	595	-
1969	520	6,427	966	1,326	1,626	4,645	467	17
1980	524	5,357	1,091	1,592	1,629	4,510	296	28
1971	759	4,762	1,056	1,862	1,798	3,142	228	46
1972	1,255	4,644	856	2,725	1,915	2,369	310	38
1973	1,768	5,571	1,445	2,628	2,024	1,690	141	147
1974	3,742	6,013	1,103	2,211	2,179	956	59	89
1975	4,548	4,620	1,389	2,584	1,469	642	108	51
1976	5,652	6,368	1,025	2,507	935	1,007	124	97
1977	6,704	5,378	1,141	1,755	773	1,435	939	203
1978	7,550	6,582	1,376	1,668	628	2,569	152	982
1979	9,321	6,599	1,769	3,029	472	2,739	443	4,286
1980	9,443	3,636	642	1,223	370	5,013	482	4,310
1981	9,326	968	435	1,126	251	4,668	159	27,259
1982	10,419	2,546	2,532	2,062	239	4,475	918	33,134
1983	16,444	612	1,243	893	108	4,238	81	52,377

Source: Ministry of Environment & Natural Resources West Kenya Annual Report

Table 3.19 Gazetted Forests

Name of Forest	Area(ha)	District	Status of Land	Proc. No. or Legal Notice and Date
South-western Mau	86,870.9	Kericho and Nakuru	Govt.	44/1932
Western Mau	19,833.3	- do -	- do -	- do -
Trans-Mara	35,270.3	Narok	Trust	102/1941

Source: Gazetted Forests of Kenya, Forestry Department

Table 3.20 Ungazetted Forests

Name of Forest	Area(ha)	Surveyed	Boundary Plan	Govt. or Trust Land	District
Koguta	413	Yes	180/201	Trust	Kisumu
Miriu	171	No		- do -	South Nyanza

Source: Ungazetted Forests of Kenya, Forestry Department

Table 3.21 Results of environmental impact assessment (1/2)

Item	Prediction	Evaluation
Settlement	No submergence is expected in the project area since it plans a run-of-river type power generation.	0
Land Issues and Compensation	About 50,000 m ² will have to be secured for the construction of such major facilities as intake, surge tank, powerstation and access road on the almost non-cultivated land. Land issues are not foreseen so far as it is properly compensated.	0
Economic Activity	A large construction labour demand is expected. Incremental agricultural production is also expected by introducing perennial irrigation.	+H
Recreation	The Odino Falls has been planned to be submerged according to the initial plan. It is, however, to be preserved since the proposed damsite have been shifted upstream. Flow in the downstream area will be decreased due to intake for power generation and, consequently, the potential value of Odino Falls as tourism resources would be dropped. Notwithstanding, the accessibility to the Odino Falls is so inferior and people are scarcely able to visit there at present that it will be less affected.	-L
Public Health	It is predicted that <i>Anopheles gambiae</i> , a vector of malaria will increase in the irrigated area. Also, it is predicted that snails which are host of miracidium will increase in the irrigation canals and schistosomiasis will become more popular than the present time in the irrigated area.	-H
Sedimentation	Sediment are deposited at the intake gate and/or in the sand stilling basin. It will be discharged into downstream by the gate opening during floods. Since sedimentation into Lake Victoria takes place almost during flood period, it will be less affected.	-L

Table 3.21 Results of environmental impact assessment (2/2)

Item	Prediction	Evaluation
Vegetation	<p>Since the major structure sites such as intake, surge tank, powerstation and access road are merely covered by scattered shrubs and, further, ground modification is to be confined to a small area, vegetation will be less affected.</p> <p>The surge tank site, however, is located in the Koguta ungazetted forests, afforestation will be necessary at and around the site after construction.</p>	-L
Wildlife	<p>Wildlife will not be affected because of no inundation in addition to tree felling during construction.</p>	-L
Fishes and Fisheries	<p>Aquatic biology in the river channel between the damsite and Sangoro will be affected, because river flow in the lower reaches will be decreased due to intake for power generation. Local inhabitants presently catch fishes such as <i>Labeo victorinus</i> (Ningu), <i>Synodontis victoriae</i> (Okoko) and etc. for feeding, and such catches would be decreased due to the implementation of the project.</p> <p>Some species in Lake Victoria which migrate upstream for spawning will not be affected because their migration takes place during the flood season.</p>	-L

Source: JICA Study Team

Table 4.1 Production, Consumption and Export of Cement

(Unit: 10³ tons/year)

	Year				
	1979	1980	1981	1982	1983*
Production	1,147.7	1,279.9	1,280.3	1,312.3	1,187.0
Export	510.2	530.4	661.0	737.4	769.8
Consumption in building and construction industry	631.0	691.2	652.5	579.3	567.3

* Provisional

Sources: Monthly Statistical Bulletin, March - May 1984;
 Figures in "Economical Survey 1984" are slightly different.

Table 4.2 Price of Cement

(Unit: Shillings/ton)

	Year					
	1979	1980	1981	1982	1983	1984.11
(1) Domestic market	721	1,017	1,357	1,357	1,357	1,377
(2) Export market	327	383	439	524	632	

Sources: (1) 1983-84, Kencem
 1979-82, calculated from construction cost index
 (end-of-year figures) in Statistical Abstract 1983.
 (2) Calculated from export statistics (value and quantity)
 in Monthly Statistical Bulletin, March - May 1984.

Table 4.3 Import/Export Statistics

(Unit: 10³ K£)

	1975	1976	1977	1978	1979	1980	1981	1982*	1983*
Total Export	230,356	333,395	480,259	369,965	385,533	487,644	513,863	545,737	649,100
Total Import	362,586	406,997	531,446	661,125	620,187	959,030	932,406	900,305	925,400
Export Duties ^{a/}	-	-	8,273	2,804	7,025	3,131	5,295	6,830	5,500
Import Duties ^{a/}	49,181	52,859	104,197	101,274	102,482	145,970	183,712	165,290	170,000
" ^{b/}	47,368	47,990	66,159	84,293	90,304	120,387	150,440	158,572	

a/ Given by fiscal year
b/ Given by calendar year
* Provisional

Sources: Statistical Abstract 1982 (p.64, p.74, p.77, p.215), 1983
Economic Survey 1984

Table 4.5 Foreign Exchange Rates and Devaluation of Kenyan Shillings

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984.3	1984.11
U.S. Dollars	8.26	8.31	7.95	7.40	7.33	7.57	10.29	12.73	13.80	13.62	15.00
SDR [*] /	9.66	9.66	9.65	9.66	9.66	9.66	11.95	14.06	14.42		
Devaluation							Jan. 23.7%	Dec.10 17.7%	May 2.6%		

Source: Economic Survey 1983

Statistical Abstract 1982

* Special drawing right

Table 4.6 Government Revenue from Indirect Taxes and GDP(Unit: 10³ Kf)

	Fiscal Year					
	1978	1979	1980	1981	1982	1983
Indirect taxes						
(1) Total	267,984	341,488	410,336	475,034	467,907	607,048
(2) Excise	49,023	59,453	60,240	63,964	78,490	81,500
(3) Sales tax	99,769	154,907	179,388	194,795	193,000	304,500
(4) (2)+(3)	148,792	214,360	239,628	258,759	271,490	386,000
GDP						
(5) At factor cost	1,780	1,975	2,235	2,597	2,951	3,291 ^{*/}
(6) At market prices	2,050	2,272	2,632	3,039	3,420	(3,849) ^{*/}
Ratio of indirect taxes (4) to GDP (6) in %	7.3	9.4	9.1	8.5	7.9	(10.0)

Sources: (1) - (4) Statistical Abstract 1982 and 1983
 (5) - (6) Statistical Abstract 1983 for 1978-82
 Economic Survey 1984 for 1983

^{*/} Provisional

FIGURES

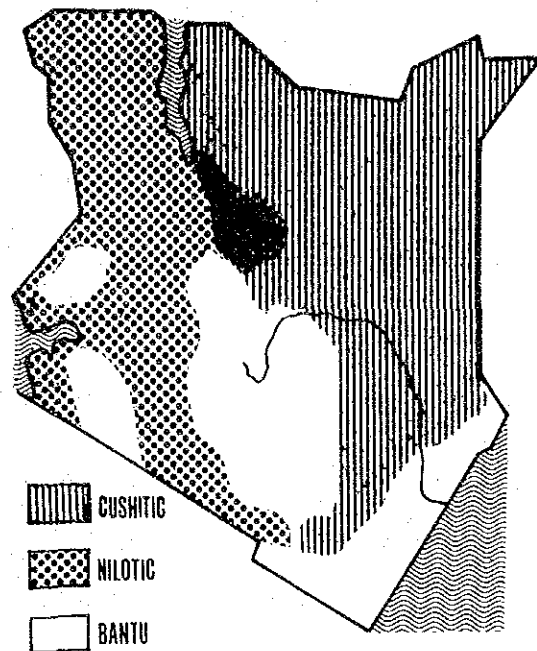


Figure 1.1 Approximate Locations of Three Linguistic Classes

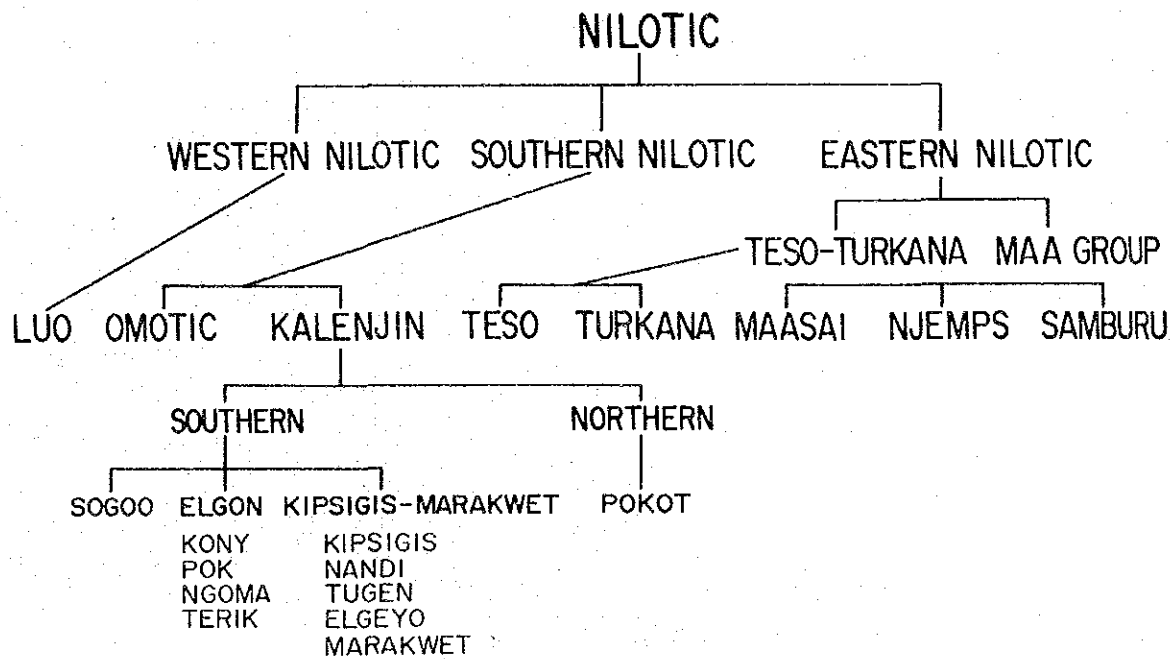


Figure 1.2 Breakdown of Nilotic-Speaking People

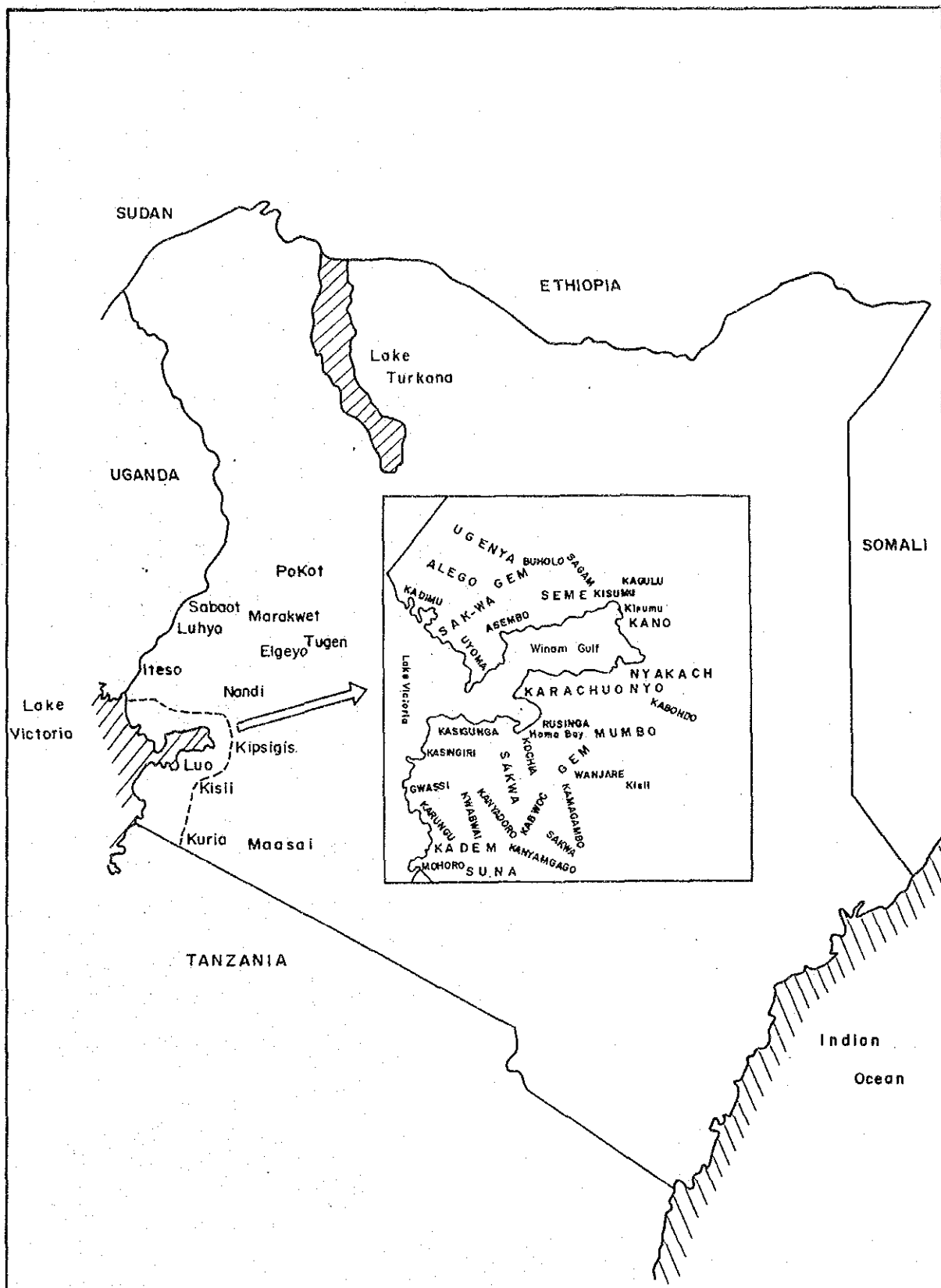


Figure 1.3
 Relative Positions of Major Tribes
 in the LBDA Area

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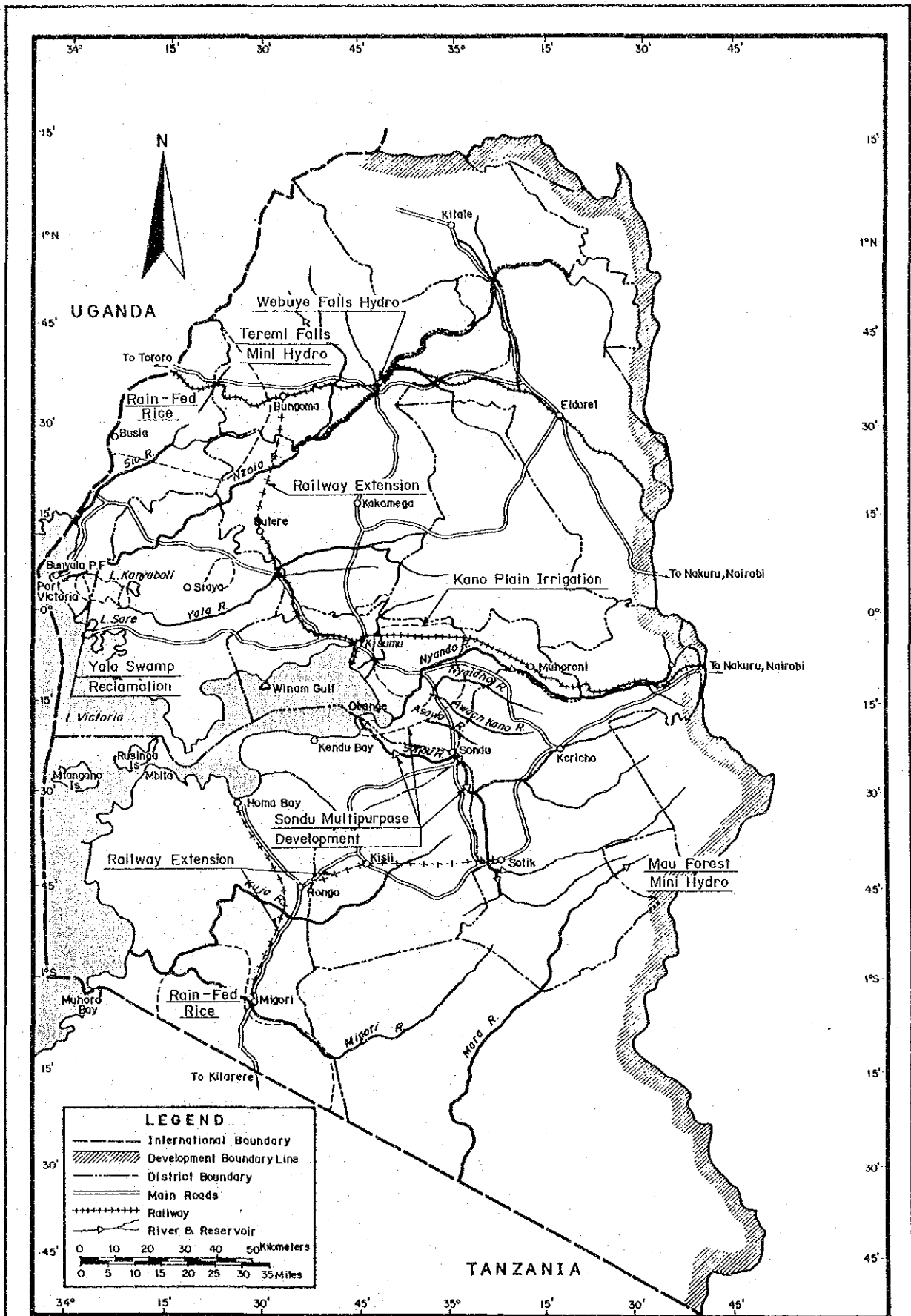


Figure 2.1 Major Infrastructure and Agricultural Projects Included in Five-Year Plan (1983 - 88)

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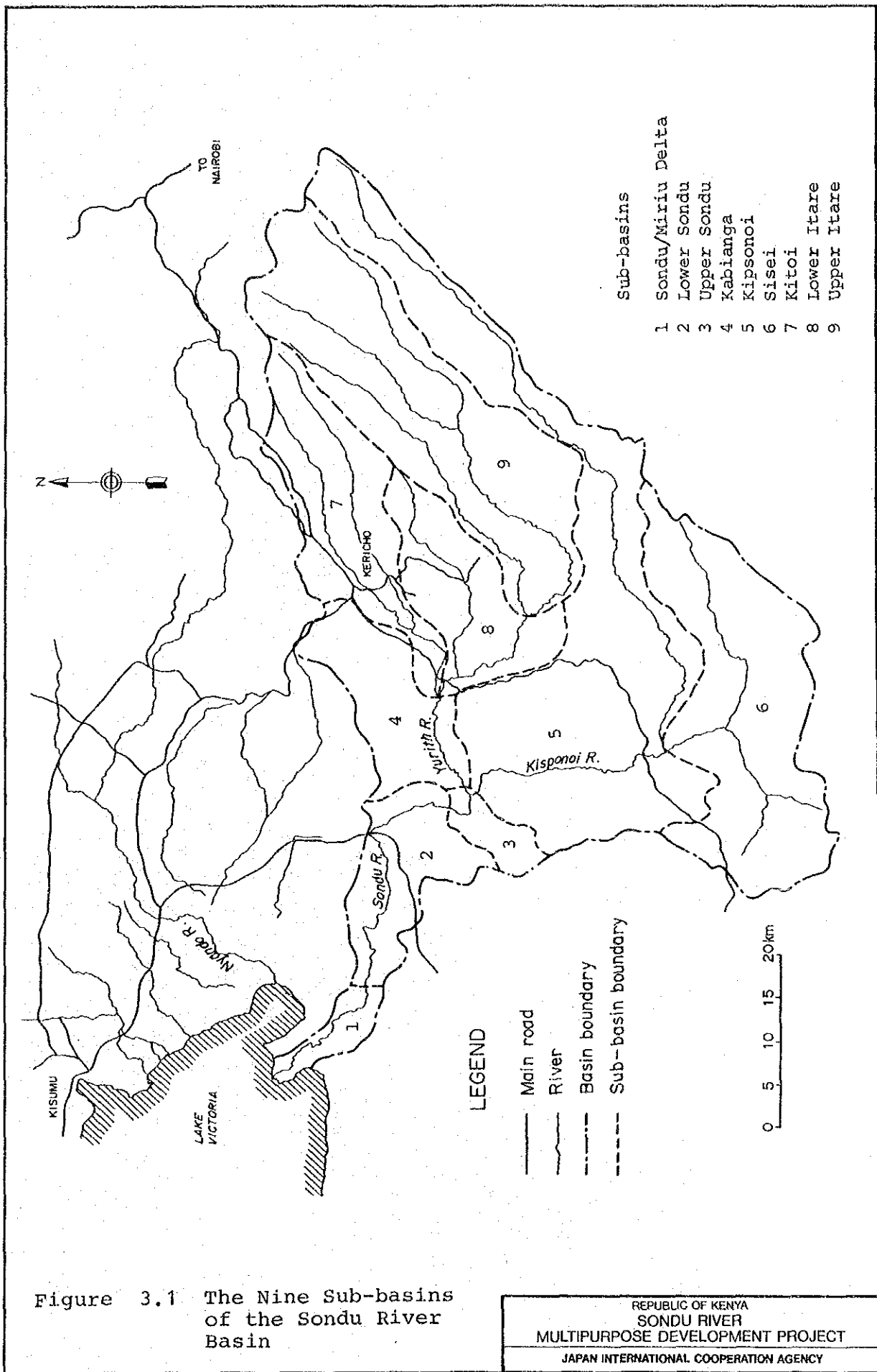


Figure 3.1 The Nine Sub-basins of the Sondu River Basin

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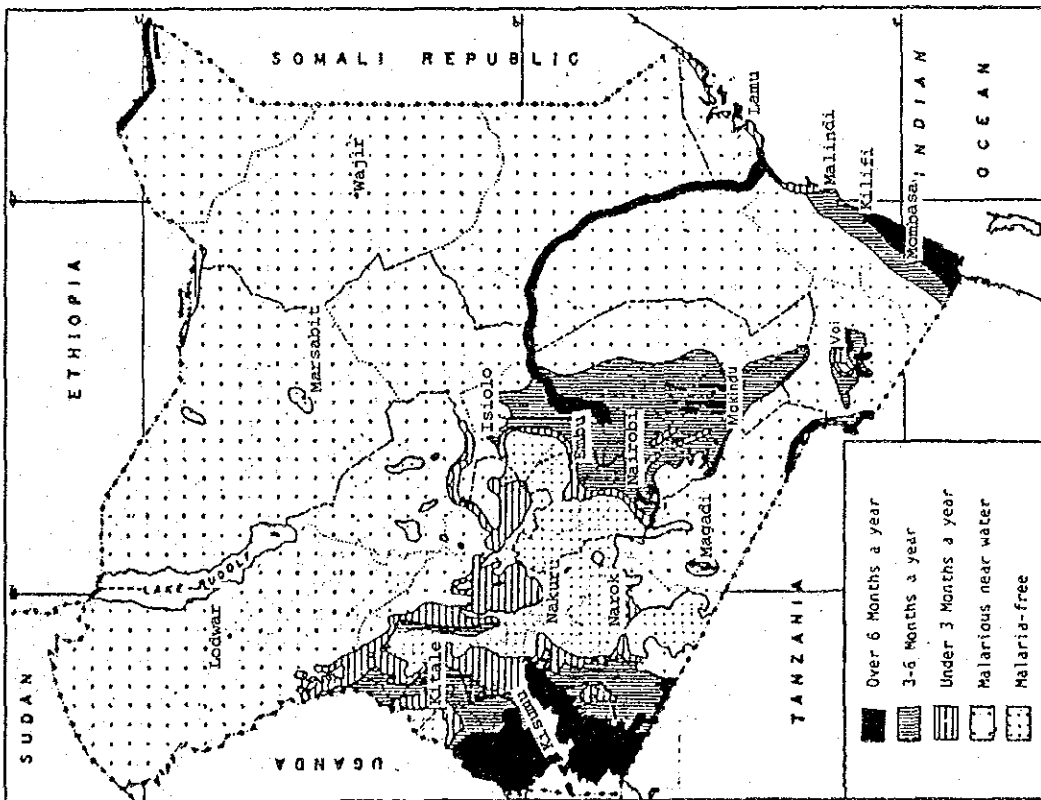


Figure 3.2 Distribution of Malaria Kenya

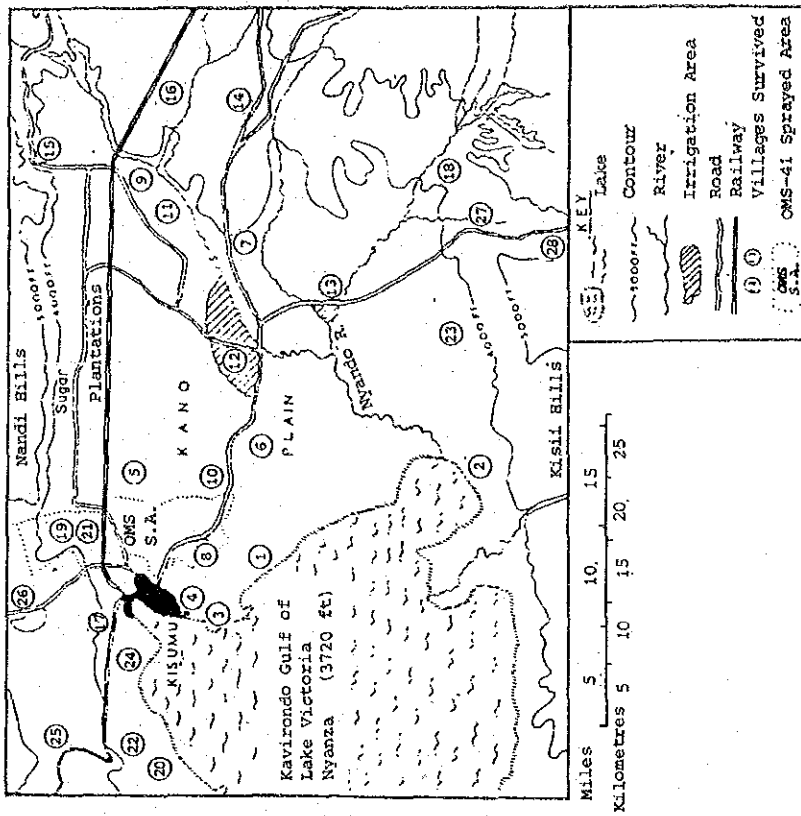
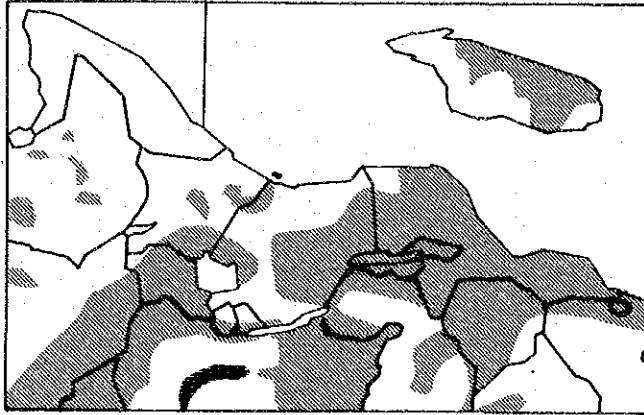


Figure 3.3 Collection Place of *A. Gambiae* near Kisumu

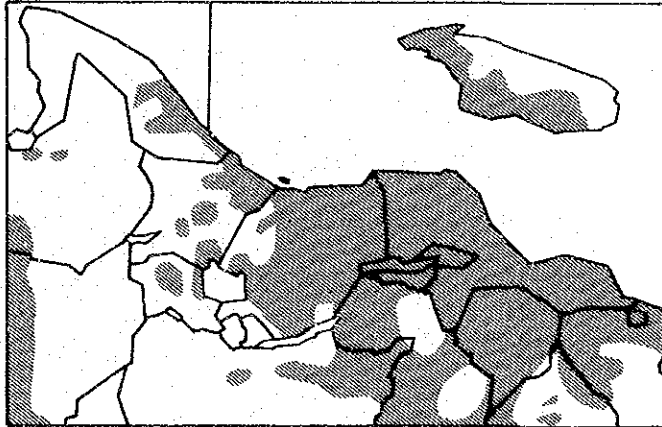
Sources:

Figure 3.2 - Health and Disease in Kenya 1974

Figure 3.3 - East African Institute of Malaria and Vector
- Borne Diseases, January-December 1970



Schistosoma Haematobium



Schistosoma Mansoni

Source: Medical Treatment Handbook in East Africa, Japan Association for Tropical Medicine

Figure 3.4 Distribution of Schistosomiasis in East Africa

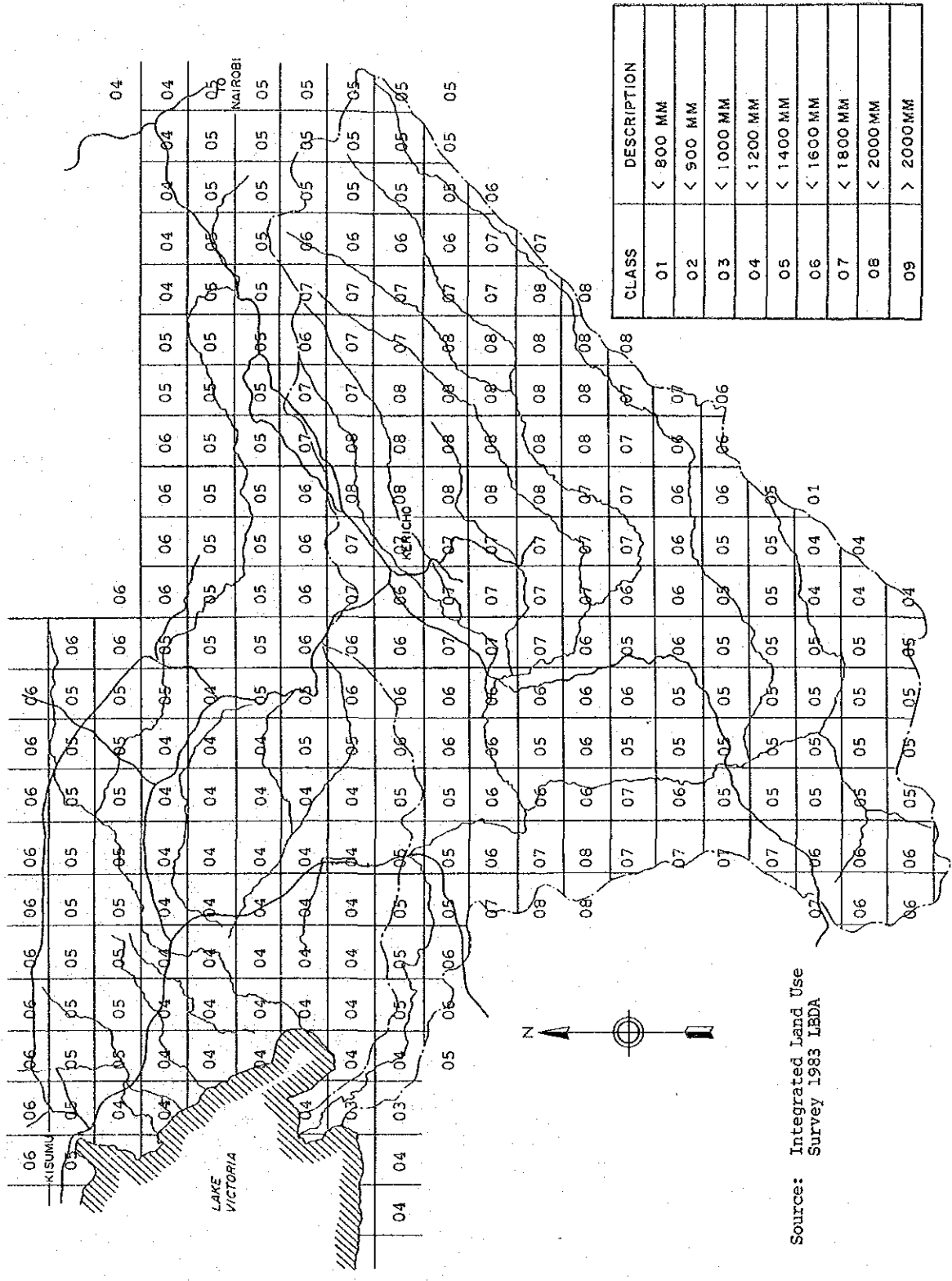
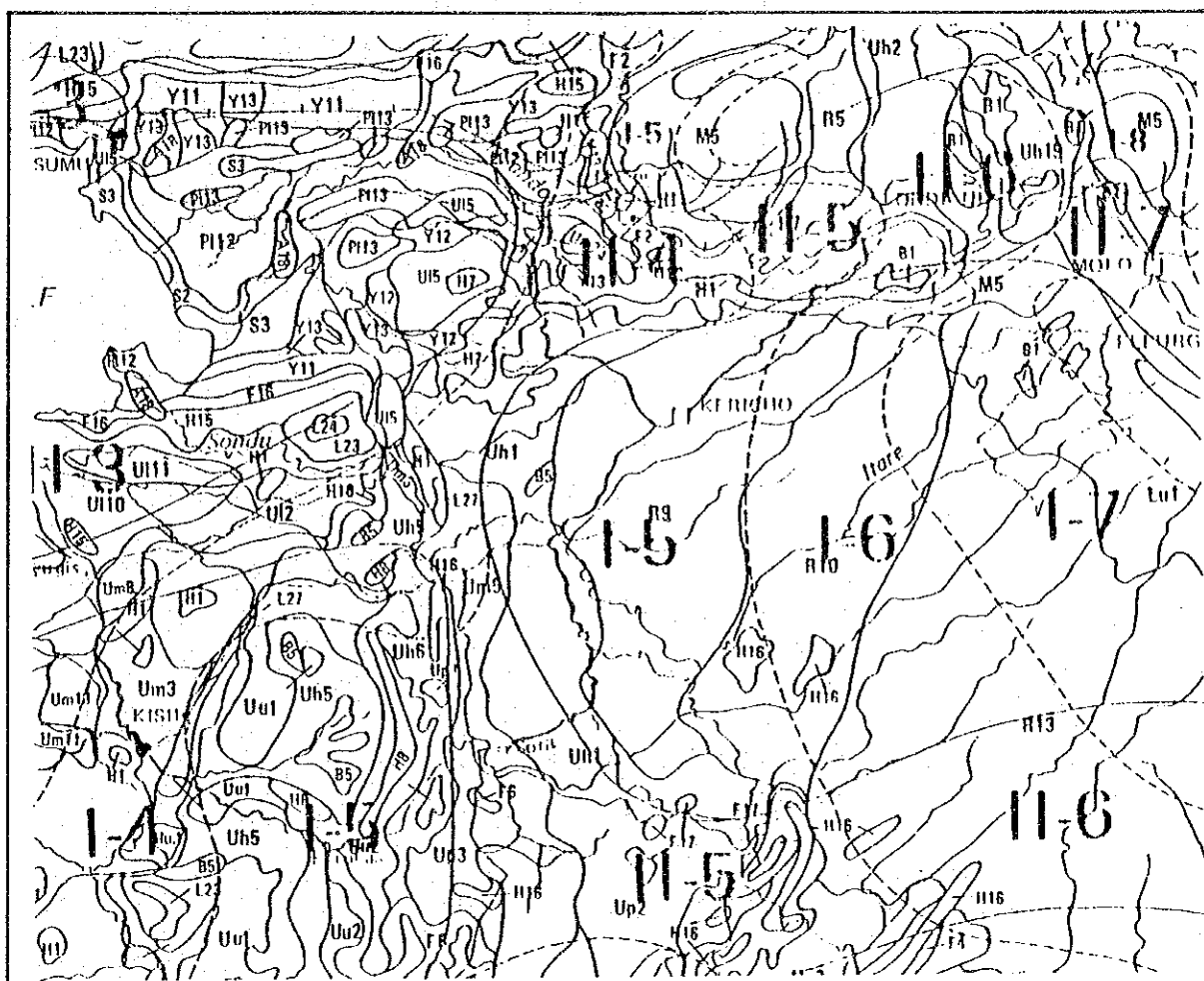


Figure 3.5 Annual Rainfall

Source: Integrated Land Use Survey 1983 LBDA



M5	MVbn (x)	F2	FBfn	Um3	UmBrn	UmP
		F4	FPht	Um5	UmInh	
H1	HBbh	F6	FY+hg	Um8	UmYhr	
H5	HPtm	F16	FUqf	Um13	UmGFfn	
H7	HIhv	F17	FQah	Um23	UmUbe (P)	
H8	HY+ty					
H15	HURd	Y11	YUwv	UI2	UIBhr	
H16	HQu	Y12	YUwe	UI5	UIIir+be	
		Y13	YUc	UI10	UIYhr+I (m)	UIG
				UI11	UIGfo+ir	
L23	LIfn					
L24	LIfr (m)	Uu1	UuI+nm+thr	UuY+		
L27	LQfh	Uu2	UuY+ht	UuU	Up2	UpB+we+vc
					Up3	UpY+we+thr
Lu1	LuPth	Uh1	UhBnh	PI12	PIDvp (o)	
		Uh5	UhI+nM	PI13	PIDvc (o)	Pt.PtU
R9	RBnh+bh	Uh6	UhY+fn			
R10	RB+nt+bh	Uh19	UhX+ht	A18	AAje	
R13	RPTm+bt			B1	BPwh	BI
				B5	BVwe	
				S2	Sgh	
				S3	Sgh+od	T

Source: Exploratory Soil Map and Agroclimatic Zone Map of Kenya 1980

Figure 3.6 Soil Map

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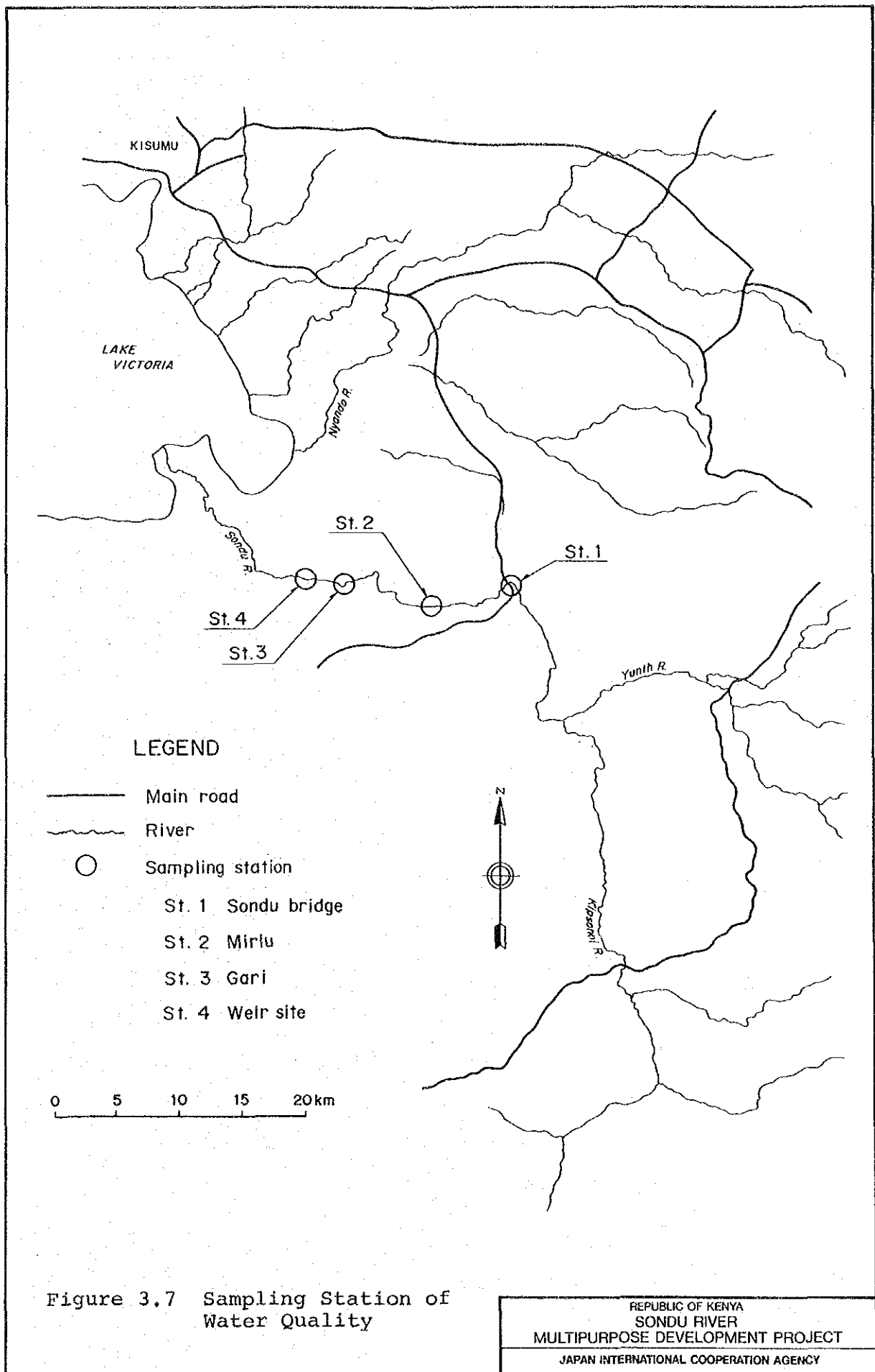


Figure 3.7 Sampling Station of Water Quality

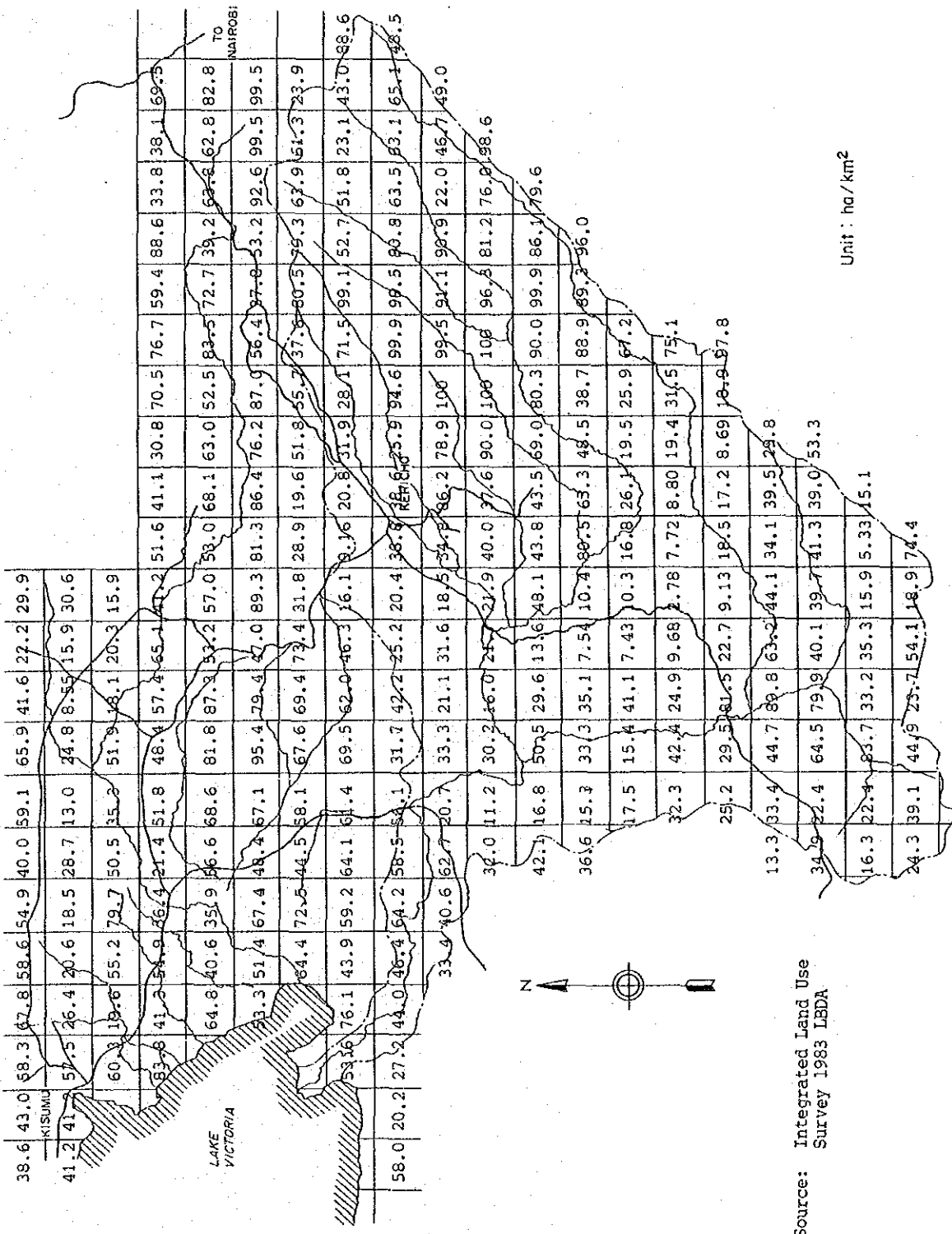


Figure 3.8 Natural Vegetation

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Source: Integrated Land Use Survey 1983 LBDA

Unit: ha/km²

Gari

Some shrubs (5-6m) are sparse leaved high trees (about 20m) which seem to be eucalyptuses. Except for that, natural grassland extend.



Damsite

As shrubs (3-5m) are almost same height, it seems that they were cut down greatly in the same time. It can be considered that the cycle of felling is short by scattered shrubs.

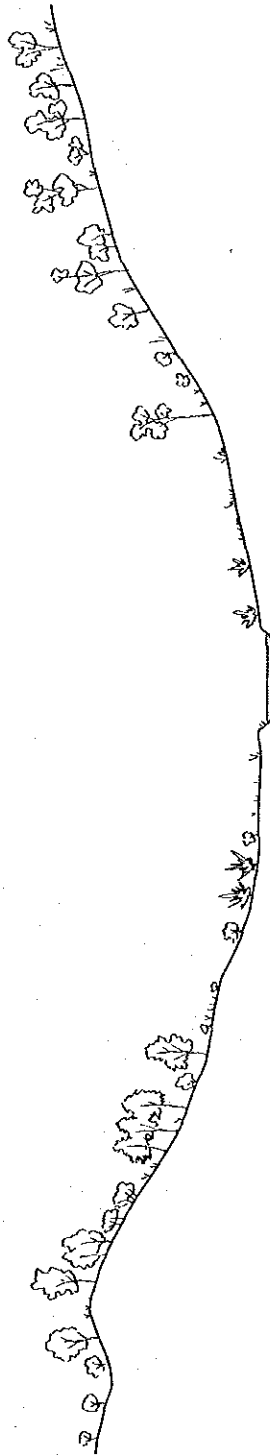


Figure 3.10 Sectional Illustration of Vegetation

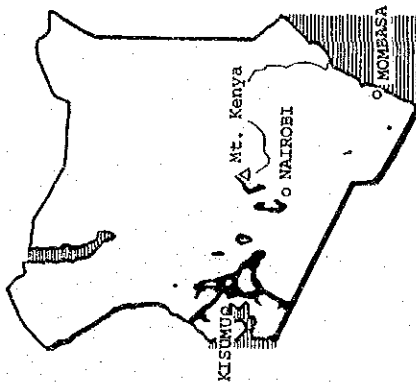
LIMURU TYPE

General description:

In this zone coffee is the major cash crop, not requiring irrigation. It is cool, moist with generally constant rainfall.

Fruits which can be grown:

Lemon
Guava
Macadamia
Mulberry
Pawpaw
Orange
Plum



Trees known to grow in the zone:

Aberia caffra
*Acacia abyssinica**
Acacia gerrardii
Acacia lahai
*Acrocarpus fraxinifolia**
Albizia cortaria
*Albizia gummifera**
*Albizia zygia**
*Antiaris toxicaria**
Brachyleana huichinsii
Bridelia micrantha
Calodendrum capense
*Casuarina cunninghamiana**
*Cordia abyssinica**
*Croton megalocarpus**
Dombeya goetzenii
Erythrina abyssinica
*Eucalyptus microcorys**
Eucalyptus paniculata
*Eucalyptus saligna**
Faurea saligna
Ficus natalensis

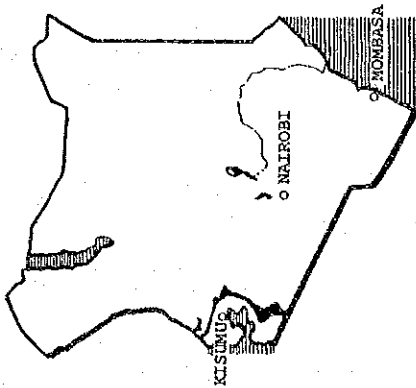
MIGORI TYPE

General description:

Similar to but slightly drier than Kakamega Type. Sugar cane is the dominant cash crop.

Fruits which can be grown:

Avocado
Grapefruit
Guava
Lemon
Macadamia
Mandarin
Mango
Mulberry
Orange
Pawpaw



Trees known to grow in the zone:

Aberia caffra
Acacia gerrardii
Acacia polyacantha
Acrocarpus fraxinifolia
*Albizia cortaria**
Albizia gummifera
Albizia zygia
*Antiaris toxicaria**
Brachyleana huichinsii
*Bridelia micrantha**
Calodendrum capense
Cassia siamea
Casuarina cunninghamiana
*Chlorophora excelsa**
*Cordia abyssinica**
Croton megalocarpus
Erythrina abyssinica
Eucalyptus microcorys
*Eucalyptus saligna**
Faurea saligna
*Ficus natalensis**
*Gliricidia sepium**

Note: * This indicates that this particular climate Type is a climax zone for the species.

Source: A Picket Directory of Trees and Seeds in Kenya

Figure 3.11
Trees Known to Grow in Each Climate Type (1/2)

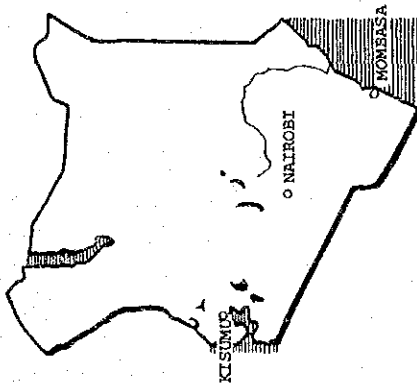
KERICHO TYPE (Zone I, 5-6)

General description:

Includes the primary tea growing zones of Kenya. The area is cool, humid and quite fertile, between 1800 and 2400 metres.

Fruits which can be grown:

- Avocado
- Macadamia
- Mulberry
- Pawpaw
- Plum



Trees known to grow in the zone:

- Aberia caffra
- Acacia abyssinica*
- Acacia lahai*
- Acrocarpus fraxinifolia
- Albizia gummifera
- Albizia zygia
- Catodendrum capense
- Casuarina cunninghamiana
- Cordia abyssinica
- Dombeya goetzenii*
- Erythrina abyssinica
- Eucalyptus micrororys*
- Eucalyptus paniculata*
- Eucalyptus saligna*
- Faurca saligna
- Ficus natalensis
- Grevillea robusta
- Harungana madagascarensis*
- Maesopsis emini
- Markhamia platycalyx
- Ocotea usambarensis*
- Olea welwitschii*
- Podocarpus millanjianus*

Note: * This indicates that this particular climate type is a climax zone for the species.

Source: A Pocket Directory of Trees and Seeds in Kenya

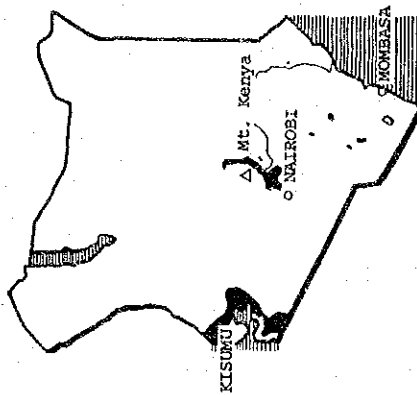
KISUMU/MURANG'A TYPE (Zone III, 2-3)

General description:

Sub-humid medium potential agricultural area with cotton, tobacco and sunflowers as the major cash crops.

Fruits which can be grown:

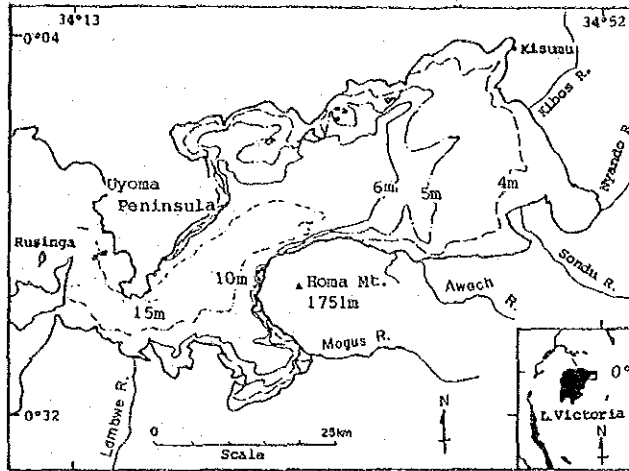
- Avocado
- Cashew nut
- Coconut
- Grapefruit
- Guava
- Lemon/Lime
- Mandarin/Orange
- Mango
- Mulberry
- Pawpaw



Trees known to grow in the zone:

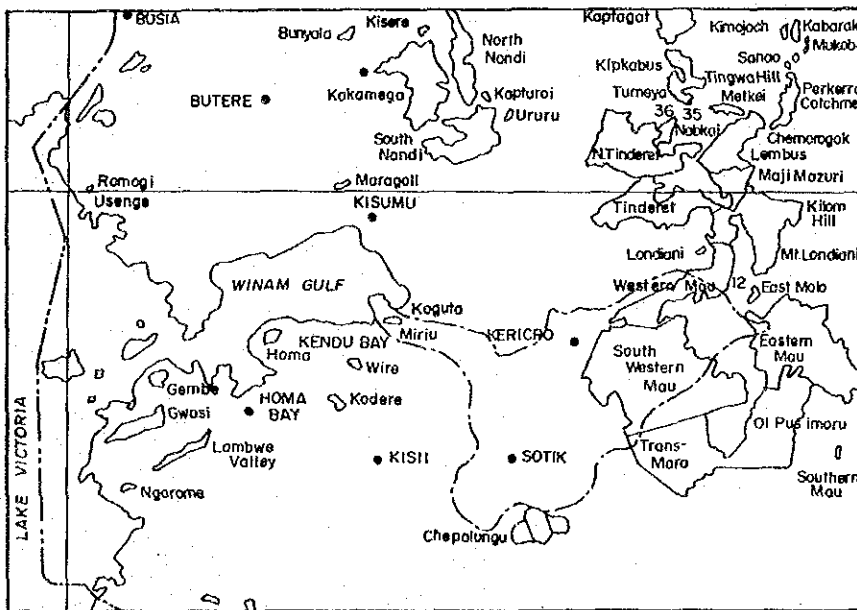
- Acacia albida*
- Acacia gerrardii
- Acacia nilotica
- Acacia polyacantha
- Acacia seyal
- Acacia tortilis
- Albizia coriaria*
- Albizia gummifera
- Albizia zygia
- Antiaris toxicaria
- Azadirachta indica
- Balanites aegyptiaca
- Borassus aethiopicum*
- Brachylaena hutchinsii
- Bridelia micrantha*
- Calodendrum capense
- Cassia siamea*
- Casuarina equisetifolia*
- Chlorophora excelsa
- Conocarpus lancifolia
- Cordia abyssinica
- Terminalia brownii
- Warburgia ugandensis

Figure 3.11
Trees Known to Grow in Each Climate Type (2/2)



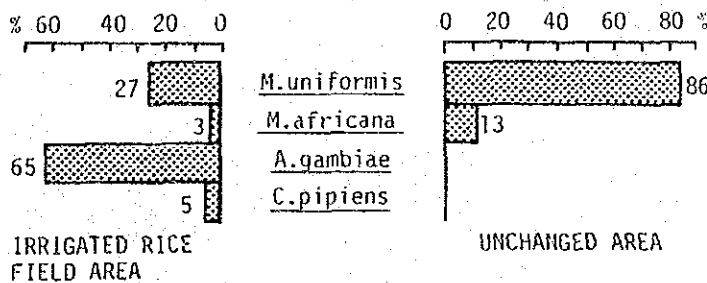
Source:
Observations on Movement
Patterns of Tilapia Spp.
in Nyanza Gulf, Lake
Victoria, East Africa

Figure 3.12 Physical Features of Nyanza Gulf,
Lake Victoria



Source:
Gazetted and Ungazetted
Forests of Kenya,
Forestry Department

Figure 3.13 Gazetted and Ungazetted Forest Areas
in the Sondu Basin



Source:
From Surtees et al (1970)
Reproduced by Permission
of the Royal of Tropical
Medicine and Hygiene

Figure 3.14 The Proportion of Various Mosquito
Species in Different Type Area

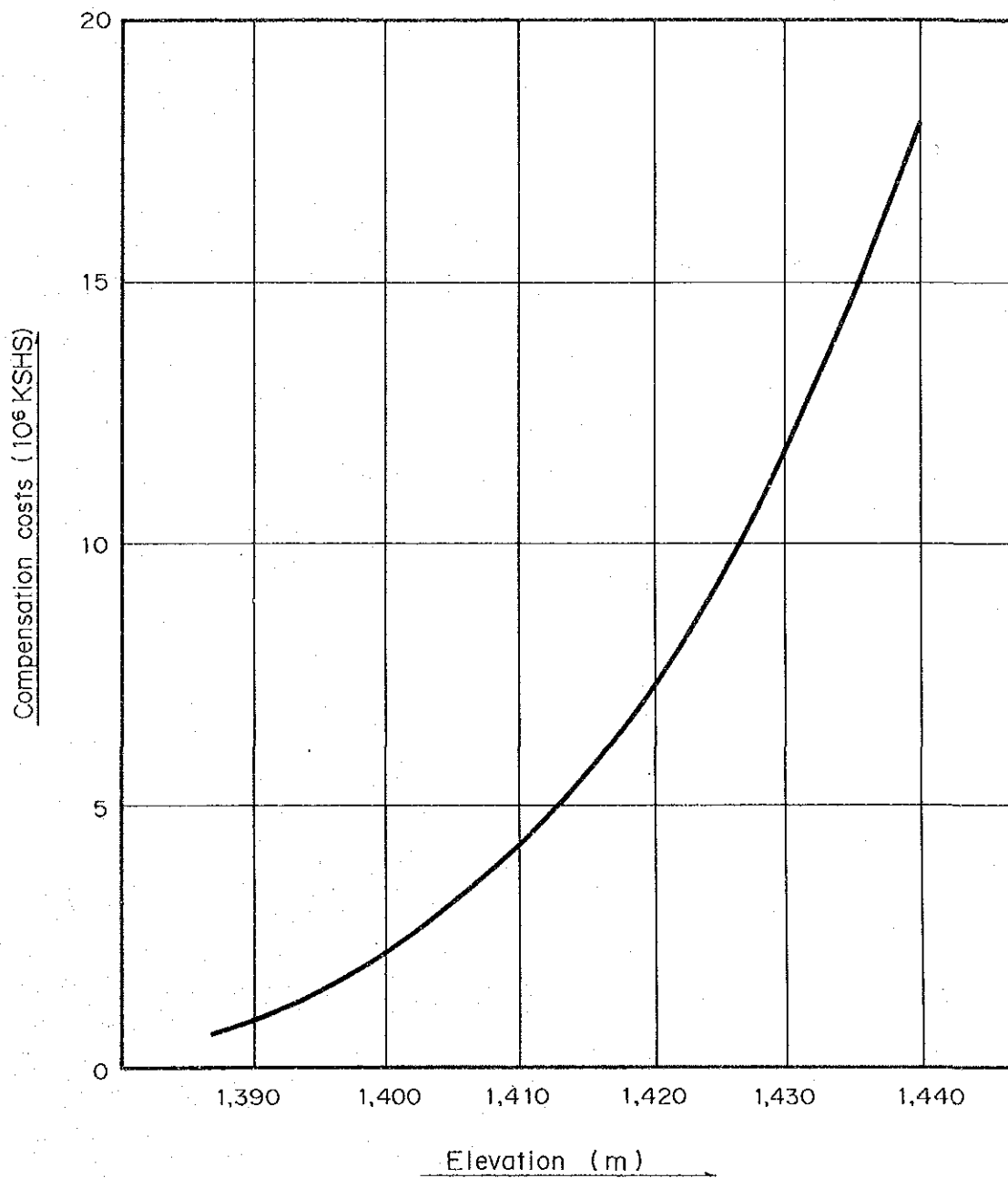


Figure 4.1
Compensation Costs by Elevation

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