

M. IRRIGATION, DRAINAGE AND FLOOD PROTECTION

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M.1 Irrigation

The irrigation area in the study area is estimated as 4,704 acres (1,904 ha), and Marigat (1,656 acres (670 ha)), Eldume (716 acres (300 ha)), Sandai (544 acres (220 ha)) and Lobi (469 acres (190 ha)) are major locations of irrigated agriculture. All irrigation scheme abstract water from rivers, not from borehole, pan and Baringo Lake. Total irrigated area in these Locations occupies 83 percent of whole irrigated area in the study area, and a profile of major irrigation scheme is summarized as Table M.1-1 and M.1-2.

Table M.1-1 The Profile of Each Irrigation Scheme

Name (Location)	Organizatio n (River)	Started Year	Irrigated Area (acres)	Sharing * ¹ Percentage	Annual Water * ² Abstraction in 1998
Perkera (Marigat)	NIB (Perkera)	1956	1,500 (607 ha)	91%	1,025 litter/sec
Eldume (Eldome)	Community (Molo)	1984	600 (243 ha)	84%	410 litter/sec
Sandai (Sandai)	Community (Waseges)	1980 (1932) ^{*3}	544 (220 ha)	100%	372 litter/sec
Kamoskoi (Lobi)	Community (Lobi)	1950'	400 (162 ha)	85%	273 litter/sec

Note;

*1; Sharing percentage in Location.

*2; The Annual water abstraction quantity is only recorded by Perkera irrigation scheme, and it is applied to another irrigation schemes (9,946 cu.m/acre/May-August).

*3; Sandai irrigation scheme was established in 1932, and intake was installed in 1980.

These irrigation schemes shares 65 percent of the total irrigated area, and they are located in a southern part of Baringo Lake. Perkera River and Molo River are permanent (perennial) river, so it can be abstracted in whole the year. The discharge of Perkera and Molo River can be considered as 4.3 cu.m/sec and 1.6 cu.m/sec respectively, so 10-25% of river water is abstracted by these irrigation schemes.

On the other hand, there were 2 numbers of irrigation schemes in a western part of Baringo Lake, one is Chemeron irrigation scheme, and the other is Endao irrigation scheme. These schemes used to use water of Chemeron River and Endao River respectively. These two rivers are seasonal rivers, so water could not be abstracted in whole the year. Chemeron irrigation scheme has Chemeron dam reservoir, but it has already silted up about 75 % of its designed capacity within 15 years (completed in 1986). Big flood has flashed an intake facility of Endao irrigation scheme away. Actually these two schemes are not functioning now and shows difficulty of irrigation scheme around south-western-side of the Baringo Lake.

The geological condition around Chemeron reservoir is formed by Pleistocene deposits, and these deposits are not well cemented each other, so they can be eroded easily. After flowing through these Pleistocene deposits, there are alluvial deposits and the river water may percolate into ground of alluvial deposits. The western side of Baringo Lake has broad alluvial area comparing with eastern side of it, and river course changes from here to there.

In a southeastern side of Baringo Lake, there are no big irrigation schemes and almost of them are small-scales. Southeastern side of Baringo Lake is near to a shoulder of Rift Valley, and alluvial area along river is narrow. There are two big rivers at this side, one is Ol Arabal River and the other is Mukutani River, but irrigation has just been started in these several years. Table M-3 and Figure M-1 show small irrigation schemes around Baringo Lake.

M.2 Drainage and Flood Protection

The area around Baringo Lake is called Lobo Plain and it is composed by alluvial deposit. In last El Nino in 1997, river course of 3 rivers is changed, at Lobo River, Waseges River and Endao River (Refer to Figure M.1-2). Waseges River originally flows into Bogoria Lake, but after El Nino, its course has changed to Baringo Lake direction. On the other hand, Lobo River flows into Bogoria Lake, but its course has changed to Baringo Lake direction. Previous crossing point of road B-4 at Endao River had a bridge, but new crossing point after El Nino has no bridge so foundation of road is damaged. Drainage condition of study area is not stable, and flood can occur at heavy rain. A protection of this flood is very difficult because alluvial deposit at Lobo Plain can be eroded easily and it needs high cost.

Table M.1-2 Profile of Major Irrigation Scheme in the Study Area

Scheme Name (River, Location)	Perkera Irrigation (Perkera, Marigat)	Sandai Irrigation (Waseges, Sandai)	Eldume Irrigation (Molo, Eldume)	Kamoskoi (Lobo, Lobo)
Time of Main Gate Open	AM 4:00	Full time in rainy season	Full time	No gate
Time of Main Gate Close	PM 6:00 (Nov-Mar, 2 days open & 12hrs close)	-	When maintenance is being done or volume of water is high	No gate
Water Abstraction Hours	14 hrs(Apr-Oct) 19.2 hrs (Nov-Mar)	-		-
Number of Water Cut	8 numbers	6 number	4 numbers	-
Time Water-Check (Cut) Open			AM 6:00	-
Time of Water-Check (Cut) Close			PM 6:00	-
Operation Staffs (farmers) for Irrigation Facility	L: 2*2 Field Staffs R: 2 *4 Field Staffs	1 gate keeper	9 committee members 1 T. A., 1 water guard 6 lateral leaders	-
Village at Downstream Side	Sintan Eldume Village R10 Village (R10-R13) Lokumkum Village	Tembererwe village, 300 peoples	Ntepes village, household, irrigation	No village
Problems	Farmer have broken the gate/water structure and extended their farmland in the pastoral area	1. water shortage 2. division box 3. animal distraction 4. canal lining	1. water shortage 2. animal distraction 3. intake repair	1. river course change 2. animal distraction 3. swamp condition
Starting Year of Operation	1956	1980 (1932)	1984	1950
Irrigated Area (acre)	1500	544	600	400
Number of Farmers	477	600	About 600	About 200

**BARINGO DISTRICT
IRRIGATION SCHEMES AROUND LAKE BARINGO**

Table M.1-3

No	NAME OF IRRIGATION SCHEME	NAME OF RIVER	AVAILABLE FLOW (M3/DAY)	AMOUNT ABSTRACTED AREA BEING IRRIGATED (HA)	CONDITION IN 1995	PRESENT CONDITION
1	PERKERRA	PERKERRA	15,303.18	70	In good condition	In use
2	ENDAO	ENDAO	552.96	50	Low flow	Not in use
3	SALABANI	ENDAO	Flood water	30	Used between April to September	Dry during October to March, (Depends on Flood water)
4	ELDUME	MOLO	3,369.60	300	In use throughout the year	Presently dries between October to March
5	KAPKUIKUI	LOBOJ SWAMP	Swamp water	180	In good condition	In use throughout the year
6	SANDAI	WASEGES	15,075.30	300	Well maintained	In use but dries during months of November to March
7	KAMAECH	WASEGES	15,984.00	60	In use with unlined Canals	In use but canal not maintained
8	KAMOSKOI	LOBOJ SWAMP	Swamp water	76	In use with unlined canals	In use but canal not maintained
9	NGENYING	ENDAO	4,320.00	27	Used during the availability of Flood water	In use during reserved Flood
10	CHESALGUM	MOLO	1,097.85	6	In use throughout the year	Dries from November to March
11	KAILER	WASEGES	259.20	48	In use with unlined canals	In use but canals not maintained
12	LOSEKEM	CHEMERON DAM	Dam water 540,000	32	In use with unlined canals	In use but highly silted
13	EMBOSOS	OI-ARABEL	10,072.00	40	In use with unlined canal	Used throughout the year with unlined canals
14	KISERIAN	OL-ARABEL	20,045.00	100	In use with unlined canals	In use but canals not maintained
15	MUKUTANIN	MUKUTANIN	5,904.00	25	In good condition	Out of use due to siltation
16	NYANGARI	NYANGARE	2,445.00	6	In good condition	Low flow and highly silted
17	RUNGUS	RUNGUS	46,512.00	4	Used in the month of March to June	Seasonal river and was dry at the time of visit
18	MOSURO	OL-ARABEL	2,272.32	90	In use with unlined canals	In use but canals not lined

LEGEND

TANGULBEI ●

- Study Area Boundary
- Town/Trading Center
- ~ River
- ▨ Swamp
- Irrigation Scheme

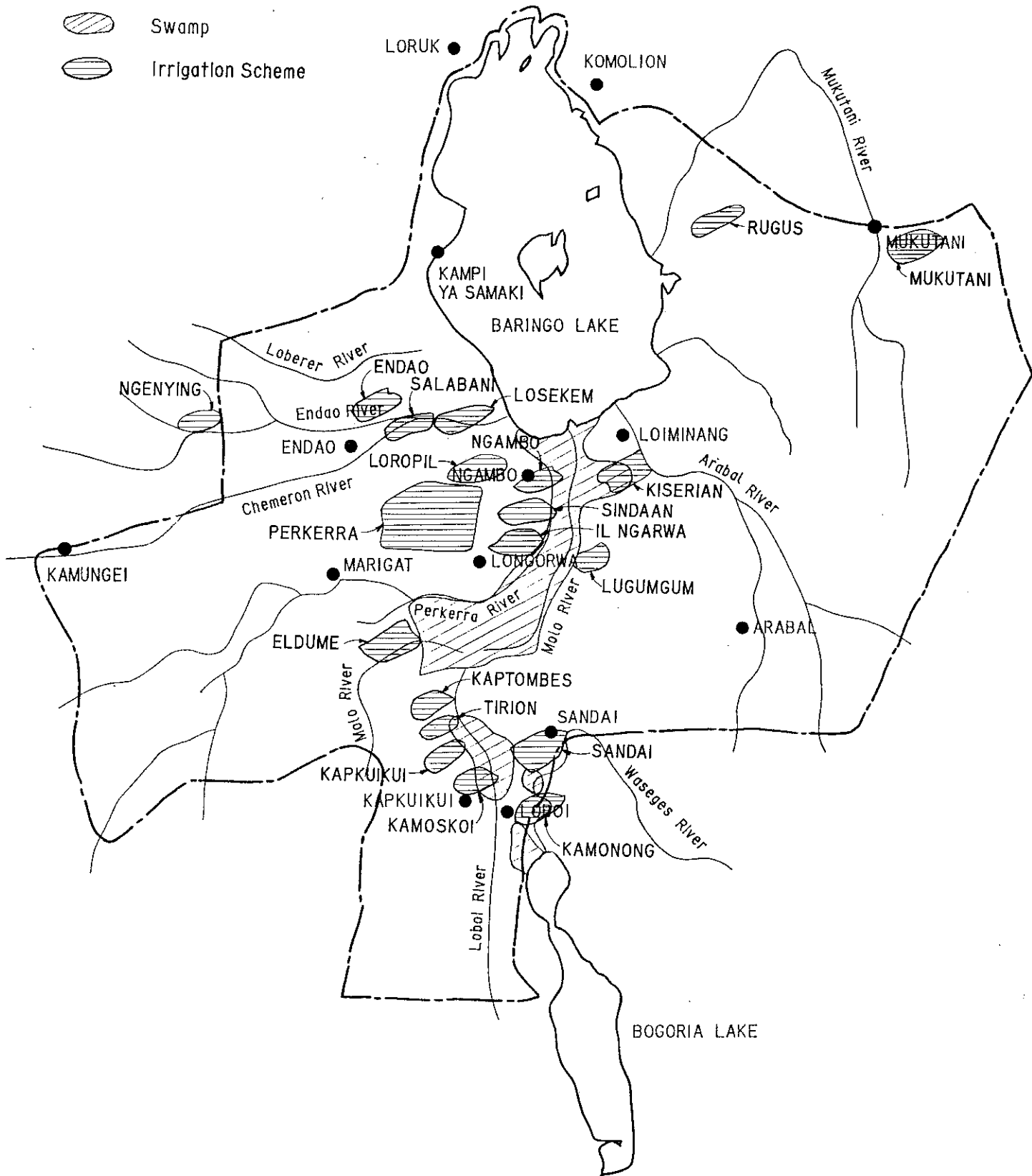


Figure M.1-1 Small Irrigation schemes in the Study Area

LEGEND

TANGULBEI ●

- Study Area Boundary
- Town/Trading Center
- ~ River
- ▨ Swamp
- - - Changed River Course

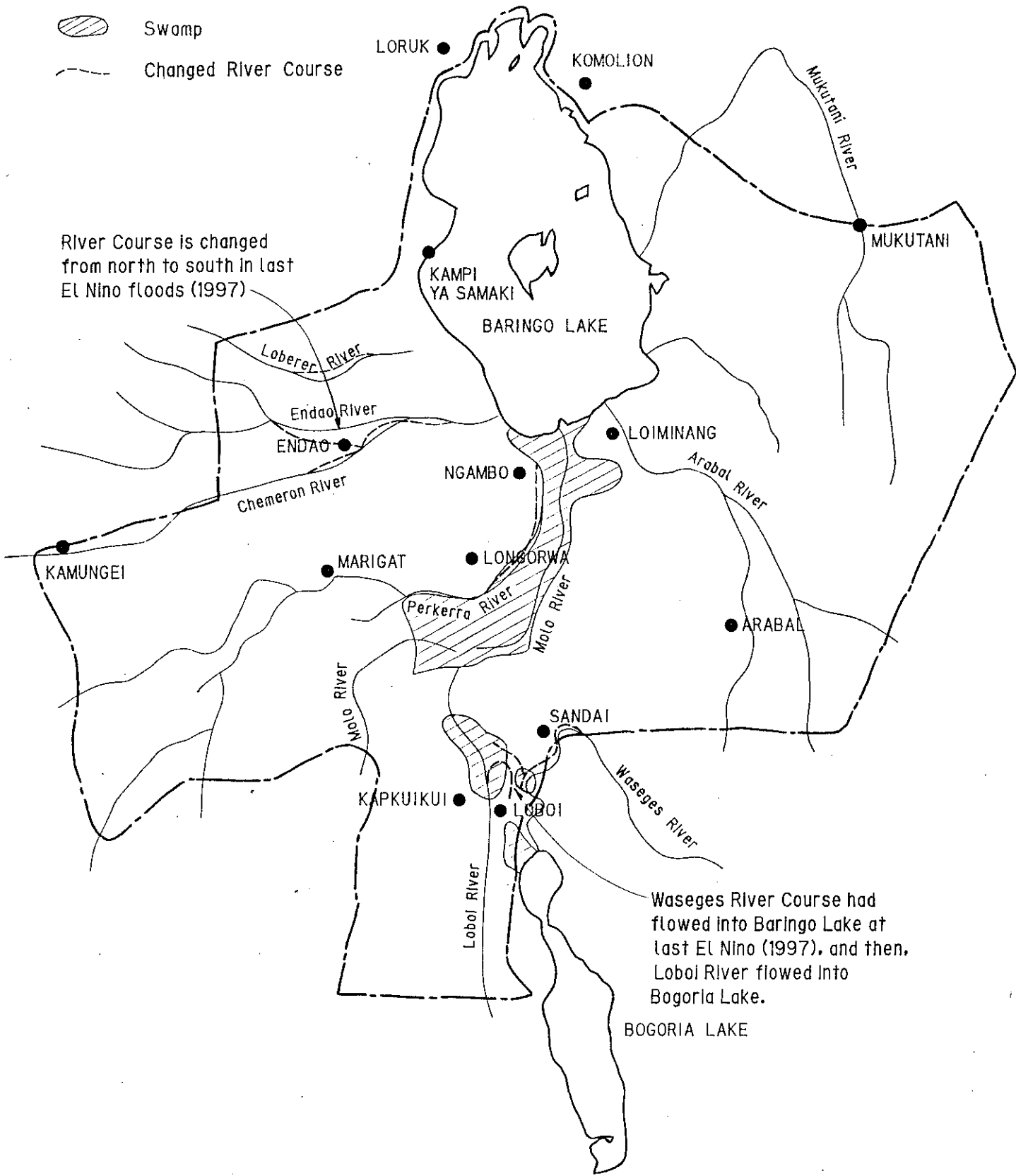


Figure M.1-2 Flood Disaster in the Study Area